

PROCEEDINGS

of the

Indiana Academy
of Science

Founded December 29, 1885

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Volume 64
1954

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BENJAMIN MOULTON, EDITOR
Butler University
Indianapolis 7, Ind.

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Spring Meeting
May 14-15
POKAGON STATE PARK

Fall Meeting
October 14-16, 1954
PURDUE UNIVERSITY

Published at Indianapolis, Indiana
1955

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6. The Constitution and by-laws reprinted from v. 62 and the Membership list reprinted from v. 61, are available to members upon application to the Secretary. Necrologies reprinted from the various volumes can be supplied relatives and friends of deceased members by the Secretary.
7. Officers whose names and addresses are not known to correspondents may be addressed care the State Library. The address of the editor of the present volume is Department of Geography, Butler University, Indianapolis, Ind.

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OFFICERS AND COMMITTEES FOR 1954

OFFICERS

President.....O. B. CHRISTY, Muncie, Indiana
Vice-President.....RAYMOND GIRTON, Purdue University
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Treasurer...F. J. WELCHER, Adult Education Center, Indiana University
Editor.....BENJAMIN MOULTON, Butler University
Press Secretary...J. A. CLARK, Department of Conservation, Indianapolis

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Anthropology.....THOMAS B. NOBLE, Indianapolis
Bacteriology.....DOROTHY POWELSON, Purdue University
Botany.....RICHARD STARR, Indiana University
Chemistry.....R. G. LARSON, Valparaiso University
Entomology.....PAUL T. ULMAN, Noblesville
Geology and Geography.....BENJAMIN MOULTON, Butler University
History of Science.....M. S. MARKLE, Earlham College
Mathematics.....RALPH HULL, Purdue University
Physics.....GEORGE D. VAN DYKE, Earlham College
Psychology.....EDWARD T. JORDAN, Indiana State Teachers College
Zoology.....JOHN D. MIZELLE, University of Notre Dame

EXECUTIVE COMMITTEE

(Past Presidents, Current Officers, Divisional Chairmen,
and Chairmen of Standing Committees)

W. P. Allyn, O. B. Christy, J. A. Clark, N. M. Coats, Sears Crowell,
E. R. Cumings, Mrs. F. K. Daily, W. A. Daily, J. J. Davis, Ed. Degering,
D. DenUyl, W. E. Edington, P. D. Edwards, H. E. Enders, R. Girton,
R. Hull, E. T. Jordan, T. K. Just, J. S. Karling, R. G. Larson, R. W. Lefler,
Eli Lilly, J. F. Mackell, M. S. Markle, M. G. Mellon, H. H. Michaud,
J. D. Mizelle, W. P. Morgan, B. Moulton, T. B. Noble, F. Payne, C. L.
Porter, H. M. Powell, Dorothy Powelson, R. R. Ramsey, R. C. Starr,
P. T. Ulman, G. D. Van Dyke, S. S. Visher, F. N. Wallace, P. Weatherwax,
Winona Welch, F. Welcher, T. G. Yuncker.

BUDGET COMMITTEE

(President, Secretary, Treasurer, Editor, and Chairmen of
Committees on Junior Academy, Library, Program
and Relation of Academy to State)

O. B. Christy, W. A. Daily, F. J. Welcher, B. Moulton, H. H. Michaud,
N. M. Coats, J. S. Karling and F. N. Wallace.

COMMITTEES ELECTED BY THE ACADEMY

Trustees of the Academy Foundation (term four years): Chairman, R. N. Harger, Indiana University School of Medicine, Indianapolis (term expires 1956); W. J. Rice (term expires 1955).

Bonding of Trustees (elected annually): Chairman, Scott McCoy, Technical High School, Indianapolis; W. P. Morgan.

Research Grants (term 5 years): Chairman, T. G. Yuncker, DePauw University (term expires 1954); W. H. Johnson (1957), M. G. Mellon (1955), P. Weatherwax (1956), J. F. Mackell (1958), O. B. Christy and W. A. Daily (ex officio).

STANDING COMMITTEES

(Appointed by the President)

Auditing: Chairman, W. P. Morgan, Indiana Central College; S. E. Elliott.

Biological Survey: Chairman, Mrs. F. K. Daily, Butler University; H. J. Brodie, F. Buser, D. G. Frey, H. H. Michaud, S. A. Minton, F. N. Young, W. Welch.

Fellows Committee: Chairman, P. D. Edwards, Mathematics, Ball State Teachers College; C. F. Voeglin, Anthropology; H. M. Powell, Bacteriology; W. Welch, Botany; F. J. Allen, Chemistry; G. E. Gould, Entomology; A. H. Meyer, Geology and Geography; S. S. Visher, History of Science; J. F. Mackell, Physics; F. D. Brooks, Psychology; W. R. Breneman, Zoology.

Index: Chairman, B. Moulton, Butler University; N. M. Coats, F. N. Wallace, Paul Weatherwax.

Indiana Talent Search: Chairman, R. W. Lefler, Purdue University; L. H. Baldinger, T. W. Torrey and P. D. Edwards. W. Leckrone and O. B. Christy (ex officio).

Invitations: Chairman, J. D. Mizelle, Notre Dame University, R. L. Hicks, T. G. Yuncker.

Junior Academy: Chairman, H. H. Michaud, Purdue University; N. E. Adams, W. H. Carnahan, R. Cooper, Paul Klinge, R. McDougal, R. E. Martin, R. E. Niswander, J. E. Potzger, M. L. Stork, P. L. Whitaker.

Library: Chairman, N. M. Coats, Indiana State Library; M. G. Mellon, Eli Lilly.

Membership: Chairman, D. DenUyl, Purdue University; M. Burton, J. O. Cottingham, H. E. Crull, M. Garner, W. H. Headlee, R. L. Hicks, Z. D. Hurlbut, W. D. Kessel, E. Kintner, R. Laubengayer, L. S. McClung, R. E. Martin, A. H. Meyer, D. E. Miller, J. Seybert, A. Strickler, H. R. Youse.

Necrologist: W. E. Edington, DePauw University.

Program: Chairman, J. S. Karling, Purdue University; J. A. Clark, C. J. Goodnight, A. T. Guard, A. A. Lindsey, H. H. Michaud, B. Moulton, J. E. Potzger, D. Powelson.

Publication of Proceedings: Chairman, B. Moulton, Butler University;
A. A. Lindsey, P. Weatherwax.

Relation of Academy to State: Chairman, F. N. Wallace, State Department
of Conservation; J. A. Clark, Eli Lilly, H. J. Reed.

Representative on Council of the A.A.A.S.: Sears Crowell, Indiana Uni-
versity.

Resolutions: Chairman, W. P. Allyn, Indiana State Teachers College; F.
Hurlbut, T. G. Yuncker.

MINUTES OF THE SPRING MEETING

POKAGON STATE PARK

POTAWATOMI INN, ANGOLA, INDIANA

MAY 14-15, 1954

President O. B. Christy called the Executive Committee Meeting to order at 4:30 P. M. in the Potawatomi Inn.

The officers and committees reported as follows:

Press Secretary: James Clark mentioned that the usual news releases had been made.

Editor: Benjamin Moulton stated that the Proceedings for 1953 would probably be ready for distribution in July. There would be 1,200 hard covers and 600 paper bound volumes.

Library: Nellie Coats sent the following report to the Secretary: The library continues to expand both in volume and in range. Twenty-nine new titles have been added during this period. Binding has been deferred pending a further study of Academy finances.

Old Business:

1. A. A. Lindsey, K. Shockley and J. O. Cottingham discussed the work of the Natural Areas Preservation Committee. It was moved and approved that the Trustees of the Academy Foundation be requested to furnish the funds for obtaining an option on the Pine Hills Area and the Academy Council be authorized to act.

2. J. E. Potzger reported by correspondence that the John Shepard Wright Memorial Library Plaque has now been put in place in the State Library Building.

New Business:

1. J. O. Cottingham read the following proposal which was moved and approved; that the Plant Taxonomy Section become a recognized section of the Indiana Academy of Science.

2. Daniel J. O'Grady discussed the status of the Indiana Psychological Association in relation to the Academy. This matter has been deferred until the Fall Meeting. The I. P. A. intends to meet with the Academy this fall.

3. The advisability of continuing the "Distinguished Paper" awards was deferred until the Fall Meeting.

4. The possibility of including the name of the Junior Academy on the cover of the Academy programs was raised by the secretary. This is to be referred to the Chairman of the Program Committee.

All reports were accepted. The meeting adjourned at 6:00 P. M.

Dinner Meeting: Following the dinner in Potawatomi Inn, the business session was called to order by President Christy in the lounge at 7:45 P. M.

1. James F. Mackell gave a short but interesting sketch concerning the career of Charles R. Dryer who is commemorated in Pokagon State Park.

2. A report of the Executive Committee Meeting by the secretary was approved by the Academy.

3. Announcements of the field trips to be taken the next day were given by the leaders.

4. J. O. Cottingham reported that 15 applications for membership had been received. These were duly acted upon and the applicants accepted for membership in the Academy.

5. Dr. Donald Stulken of Purdue University gave a very interesting illustrated talk on the survival and distribution of otters in the Aleutian Islands.

6. Stanley E. Hartzell gave a timely and thought-provoking talk on "Germ Warfare."

Eighty-five members signed the Academy roll.

All scheduled hikes were made on May 15 in very fine weather.

W. A. DAILY,
Secretary

MINUTES OF THE EXECUTIVE COMMITTEE

PURDUE UNIVERSITY, OCTOBER 14, 1954

The Executive Committee of the 70th session was called to order by President Christy in the East Faculty Lounge of the Union at 7:15 P. M.

The minutes of the Spring Meeting, held at Pokagon State Park, were read and approved.

The reports of officers and committee representatives were presented and accepted as follows:

Treasurer's Report

January 1, 1954 to December 31, 1954

Receipts

Balance on hand January 1, 1954.....	\$1,845.68
Dues and initiation fees.....	2,071.00
Publications sold	76.62
A.A.A.S. refund for research grants.....	460.00
Author's reprints, Vol. 61.....	28.20
Author's reprints, Vol. 62.....	60.49
Author's reprints, Vol. 63.....	473.59
Sale of printed envelopes—Fay Daily.....	11.00
Binding Proceedings for members.....	43.00
	\$5,069.58

Disbursements

1. Editor Vol. 63.....	\$ 200.00
2. Expenses of Secretary.....	137.44
3. Expenses of Treasurer.....	150.26
4. Stationery	204.75
5. Program Committee.....	311.97
6. L. S. McClung Research grant.....	50.00
7. J. E. Potzger Research grant.....	62.50
8. J. M. Wood Research grant.....	100.00
9. Winona H. Welch Research grant.....	50.00
10. Publication of Proceedings Vol. 63.....	241.74
11. Author's reprints Vol. 62.....	400.00
12. Author's reprints Vol. 63.....	593.23
13. Postage and packaging Author's reprints.....	26.76
14. Refund on payment for Author's reprints to L. H. Monaco..	10.32
15. Bronze plate—John H. Wright Memorial Library.....	60.00
16. Walnut stand for same.....	50.00
17. Expenses Junior Academy of Science.....	44.45
18. Expenses of President	11.87
19. Mailing Proceedings, Vol. 63.....	109.11
20. Returned Checks	4.00
21. Expenses of five officers as directed by action of 1947 Executive Committee.....	100.00
22. Binding for Academy of Science Library.....	697.00
	3,615.40
Balance on hand December 31, 1954.....	1,454.18
	\$5,069.58

Balance includes \$61.30 remaining in treasury from grant for preparation of manuscript of Indiana Scientists.

FRANK J. WELCHER, Treasurer

Press Secretary. James Clark reported that two releases were sent to the larger state newspapers and those in college towns. Radio stations, college and university publications, likewise, were sent releases. Articles of general appeal were included in the latter mailing. National scientific magazines were sent a release well in advance of publication.

Editor and Publication of Proceedings. Ben Moulton stated that the Proceedings of the Indiana Academy of Science Vol. 63 were issued in July. The Bookwalter Company has made adjustments on the cost of reprints for Vol. 62. Cost of reprints for Vol. 64, 1955, will approximate those of Vol. 63 published this year.

Trustees of the Academy Foundation. The secretary presented the tentative report for the year 1953-1954:

Assets as of October 1, 1954	\$12,406.00
One \$1,000 U. S. Treasury Bond on order	1,000.00
Cash balance at the Indiana National Bank	475.27

Research Grants. T. G. Yuncker reported as follows: Four grants were made during the first of the year:

1. Dr. L. S. McClung, Indiana University—\$100 for use in studies in connection with Clostridia.
2. Dr. J. E. Potzger, Butler University—\$125 to assist in continuation of bog pollen studies in northern Canada.
3. Mrs. Fay K. Daily, Butler University—\$70 to help defray cost of preparation and distribution of a questionnaire in connection with the Biological Survey Committee of the Indiana Academy of Science and publication of the results.
4. Dr. S. S. Visser, Indiana University—\$50 to assist in a study of population changes in Indiana.

A recent application from Joseph M. Wood of Indiana University for \$100 in connection with his studies of plant fossils was approved.

An application from Winona Welch of DePauw University for \$100 was approved. This is to aid in assembling literature, photostats, etc., in connection with the beginning of a monographic study of the Hookeriaceae-family of mosses.

Nominations. T. G. Yuncker was recommended to serve another term of 5 years as chairman of the Research Grants Committee. It was recommended that Scott McCoy continue as chairman of the Bonding Committee and W. P. Morgan serve as the second member.

Biological Survey. Fay K. Daily reported that a questionnaire to obtain the names and activities of workers in Biological Survey in Indiana was sent to all members of the Indiana Academy of Science in April, 1954. It was requested that completed questionnaires be returned before November 1, 1954. A tabulation of the results of the questionnaire follows on page 20. This work was made possible by a research grant from the American Association for the Advancement of Science which is sincerely appreciated.

Fellows Committee. P. D. Edwards reported as follows: The Fellows Committee of the Indiana Academy of Science met in Harrison Hall, DePauw University, Sunday, October 3, 1954.

After due deliberation, the following named members of the Academy were chosen by unanimous vote of the committee members present. These names are presented to the Executive Committee with the recommendation that they be elected as Fellows of the Indiana Academy of Science:

Dr. William Hugh Headlee, Department of Microbiology, Indiana University School of Medicine.

Dr. Charles B. Heiser, Department of Botany, Indiana University.

Professor Earl T. McBee, Department of Chemistry, Purdue University.

Professor Edward L. Haenish, Department of Chemistry, Wabash College.

Professor Frank T. Gucker, Department of Chemistry, Indiana University.

Professor Ernest E. Campaigne, Department of Chemistry, Indiana University.

Professor Mark Curtis Wilson, Department of Entomology, Purdue University.

Professor A. R. Addington, Department of Geology and Geography, Fresno State College.

Dr. James R. Anderson, Bureau of Agricultural Economics, U. S. Department of Agriculture.

Professor Harry E. Crull, Department of Mathematics, Butler University.

Professor Tracy Y. Thomas, Department of Mathematics, Indiana University.

Dr. J. B. Hershman, President, Valparaiso Technical Institute.

Professor A. C. G. Mitchell, Department of Physics, Indiana University.

Inasmuch as the Plant Taxonomy Section has been added to the established sections of the Academy, it is recommended that the new President appoint a member of that section to serve on the Fellows Committee.

A motion was approved that Section (m) on Fellows of the By-Laws should be altered. Paul Weatherwax suggested the following: Each active section shall be represented. The order of rotation already established is recognized. Representatives of new sections shall be added at end of list. Each year the two members at the top of list shall be dropped and two new ones representing same sections shall be added at the end of the list. When any section is discontinued by action of the Academy, the member representing that section shall be dropped from the list.

Indiana Science Talent Search. R. W. Lefler sent the following report to the Executive Committee:

College recognition of winners and participants in the Indiana Science Talent Search continues strong. Ninety-six of the ninety-eight 1953-1954 participants have reported. They have received financial aid in excess of \$51,000 for the four-year undergraduate program. They are attending thirty-one colleges and three nursing schools. Sixteen Indiana colleges are represented in this group. All excepting four of the 96 students reporting are in school.

The Indiana Search provides much stimulation to these students to enter college since it introduces every participant to each Indiana college through the Committee's reports to the colleges. This stimulation plus the financial aid usually made available by the colleges to students on the basis of need has been over recent years a prime factor in causing nearly 100% of the participants to continue their education.

The Search for 1953-1954 was again financed by *The Indianapolis Times*. Mr. Leckrone, Editor of the *Times*, has, however, found it necessary to reduce financial support for the coming year to \$500. This means that the Indiana Science Talent Search Committee must "find" about \$1,500 to continue the activity on the basis to which it has been accustomed.

Junior Academy. H. H. Michaud reported as follows:

The twenty-first annual meeting of the Indiana Junior Academy of Science was held Saturday, November 7, 1953, in the new Science Hall of Earlham College, Richmond. Two hundred fifty club members, sponsors and guests registered for the meeting. There are now about forty-five clubs listed on our roll.

Four new clubs have been added since the beginning of this school year. They include the Alchemists, Edinburg High School; the Science Club, Hamlet High School; the Science Club, Rossville High School, and the Up and Atom Club, Sandborn High School. It is especially noteworthy that some of the smaller high schools are showing an interest in science club activities.

An unusual and different program has been prepared for the Junior Academy this Saturday in combination with the Purdue Sci-Math Assembly. The morning program will include science exhibits and projects by high school club members, visits to instructional and research laboratories of Purdue University, and a conference on careers in science and mathematics. High school students will be given the opportunity to confer with specialists about projects which they have started or expect to start.

Library. Nellie Coats reported that in addition to the general search for new publications that may be acquired by exchange for the Academy's library, lists of scientific serials published in the Indo-Pacific area and in the Middle East were checked. During this year, fifty-three new titles have been added expanding the subject and geographic range of the collection. The acquisition of a nearly complete file of the Hawaiian Academy of Science Proceedings is particularly gratifying.

New equipment for recording material received by the Academy has been purchased by the State Library.

The Proceedings Vol. 63 for 1953, publication date June 29, 1954, was distributed to members, the State Library absorbing the cost of envelopes and labor.

In connection with the editor's project for binding paper backed issues of the Proceedings it was possible to supply from storage 56 earlier issues for sale to members.

Mrs. Harold Burton, Serials Librarian, prepared 204 volumes for binding, bringing the total of bound volumes to 4,870.

Relation of the Academy to State. Frank N. Wallace sent the following report: The appropriation request to the coming legislature is for

\$4,000.00. This is an increase of \$500.00 per year. I believe the Budget Committee will grant this increase for the Academy Proceedings.

Representative on the Council of the A.A.A.S. Sears Crowell attended the Boston meetings and reported the following:

The full account of the meetings of the Council are available in the journal *Science*, Feb. 19, 1954. Nothing of immediate concern to our Academy was contained therein. A substitute for Dr. Crowell will be necessary for this year's meeting to be held at Berkeley, Calif.

Old Business.

1. Natural Area Preservation. A. A. Lindsey reported that much progress has been made in relation to the possible acquisition of two areas of land, namely, Pine Hills and Englishton Park.

A motion was approved that the Committee assume the status of a "Standing Committee."

A motion was approved that the committee be authorized to act upon acquisition of the Englishton Park area.

A motion was approved that a special fund be established for the National Areas Preservation Committee to be maintained by gifts solicited from Academy members and others for the buying and maintenance of land.

No general funds of the Academy or funds of the Academy Foundation other than already authorized are to be used by the committee.

W. A. DAILY, Secretary.

MINUTES OF THE GENERAL SESSION

PURDUE UNIVERSITY, OCTOBER 15, 1954

The minutes of the Executive Committee were read and approved.

President Frederick L. Hovde of Purdue University welcomed the Academy to their campus. A response was given by O. B. Christy, president of the Academy.

W. E. Edington presented a short biography of the members who had died during the year. These were: Harry F. Dietz, Karl B. McEachron and Frederick L. Serviss.

Dr. W. R. Brenneman of Indiana University then gave an extremely interesting illustrated lecture entitled "Kalamazoo to You."

The meeting adjourned at 11:00 A. M.

Sectional meetings then began with a recess for lunch served in the basement cafeteria of the Union, after which meetings were resumed.

The annual dinner was held in the North Ballroom of the Union.

Several delightful musical numbers were rendered by Miss Lois Goodman, xylophonist; Mr. David Wilcox, accordionist; Mr. Robert Tam, vocalist, and Miss Ann Dyer, accompanist.

R. E. Girton, vice-president, then presented those sitting at the speakers' table to the dinner guests.

T. G. Yuncker read the report prepared by the Resolutions Committee.

We, your Resolutions Committee, wish to extend the thanks of the entire membership of this Academy to Dr. Karling and members of his Program Committee for the splendid arrangements provided at this meeting.

The comforts of the members of the Academy, including rooms for committee, sectional and other meetings, as well as housing and food, have been adequate and excellent.

The Academy, likewise, is grateful for President Hovde's warm words of welcome to Purdue and his sympathetic attitude toward the aims and objectives of the Academy.

The cordial hospitality and wonderful entertainment provided by Purdue University and its staff is deeply appreciated.

Daniel DenUyl presented the names of 35 applicants for membership. These were duly elected.

R. H. Cooper reported that the Academy had been invited to meet on the University of Notre Dame campus, Oct. 13-15, 1955.

The Nominations Committee report was given by the chairman, H. M. Powell. Divisional Chairmen for 1955 will be: Anthropology, John Jones, Indiana University; Bacteriology, H. A. Dettwiler, Eli Lilly and Company; Botany, A. L. Delisle, University of Notre Dame; Chemistry, John A. Buehler, Anderson College; Entomology, Donald W. Hamilton, 1237 Washington Ave., Vincennes, Ind.; Geology and Geography, William J. Wayne, Indiana University; History of Science, B. E. Montgomery, Purdue University; Mathematics, Harry E. Crull, Butler University; Physics, Dr. Francis E. Throw, Wabash College; Plant Taxonomy, A. A. Lindsey,

Purdue University; Psychology, Barron B. Scarborough, DePauw University; Zoology, Jackson Webster, Hanover College.

The following members were recommended to serve as the officers for 1955: President, A. H. Meyer, Valparaiso University; Vice-President, Willis Johnson, Wabash College; Secretary, W. A. Daily, Eli Lilly and Company; Treasurer, Frank Welcher, Adult Education Center, Indiana University, Indianapolis; Editor, Ben Moulton, Butler University; Press Secretary, J. A. Clark, Department of Conservation, Indianapolis.

The seventieth annual meeting of the Indiana Academy of Science with a general attendance of 425 and a dinner attendance of 150 was adjourned.

W. A. DAILY, Secretary.

NEW MEMBERS 1954¹

Beekman, Bruce Edward, Department of Zoology, Indiana University, Bloomington, Ind.	Z
Bernard, Sister Marie, O.S.F., Marian College, 3200 Cold Spring Rd., Indianapolis 22, Ind.	Bo, Z
Berry, Jewel Edward, 509 E. Howard, South Bend, Ind.	Z
Brookley, Arthur C., Jr., Indiana Geologic Survey, Bloomington, Ind.	G
Bundy, Wayne M., Geological Survey, Indiana University, Bloomington, Ind.	G
Crider, Mrs. Elizabeth H., 1110 W. Kessler Blvd., Indianapolis, Ind.	B, Z
Dillon, Lowell I., A-2, Hoosier Ct. Exp., Bloomington, Ind.	G
Dineen, Dr. Clarence F., Biology Department, Notre Dame University, Notre Dame, Ind.	Z
Fielder, William L., 4915 W. Pine, St. Louis, Mo.	C
Fitzwater, William D., Jr., A.E.S. Annex, West Lafayette, Ind.	Z
Frith, Dr. William C., 39 Bridgemont Whaley Bridge, NR, Stockport, Cheshire, England	C
Gallun, Robert L., 240 Schilling Dr., West Lafayette, Ind.	E
Garrison, William A., University Apts., W-109, Bloomington, Ind.	G
Gray, Henry H., 822 E. Hunter Ave., Bloomington, Ind.	G
Griffin, Charles D., 630 W. 41st, Indianapolis, Ind.	Bo
Gunther, Prof. W. C., Valparaiso University, Valparaiso, Ind.	Z
Heatwole, Harold F., Goshen College, Goshen, Ind.	Z
Herbst, Eugene L., 229 Floyd St., Elkhart, Ind.	C
Hosler, Dr. Peter, Eli Lilly and Co., Indianapolis, Ind.	Ba, C
Huling, Prof. Richard T., Franklin College, Franklin, Ind.	Z
Hunnings, Keith, 815 Park Ave., New Haven, Ind.	C
Hutton, Kenneth E., Department of Biological Sciences, Purdue University, Lafayette, Ind.	Z
King, Dr. Lawrence J., Boyce Thompson Institute, 1086 N. Broadway, Yonkers, N. Y.	Bo, H
Kingsolver, John M., G-65-A Stadium Terrace, Champaign, Ill.	E
Lange, Lester H., Valparaiso University, Valparaiso, Ind.	M
Lytle, Charles F., Department of Zoology, Indiana University, Bloomington, Ind.	Z
Madison, James A., 701 E. Seminary St., Greencastle, Ind.	G
Mahan, Robert, 244 Home Ave., Elkhart, Ind.	Ph
Mayfield, Robert Charles, 314 E. 6th, Bloomington, Ind.	G
Miller, Paul F., 1106 Washington St., Valparaiso, Ind.	G
Moran, Joseph F., Jr., Department of Biology, University of Notre Dame, Notre Dame, Ind.	Z
Murray, Dr. Raymond W., C.S.C., Department of Sociology, University of Notre Dame, Notre Dame, Ind.	A
O'Grady, Dr. Daniel C., Box 132, Notre Dame, Ind.	Ps

¹ Abbreviations following the members' listings indicate the sections of the Academy with which they are affiliated.

Orpurt, Dr. Philip A., Biology Department, Manchester College, North Manchester, Ind.	Bo
Overstreet, Rose Alice, Botany Department, Indiana University, Bloomington, Ind.	Bo
Pierson, Ralph C., 5924 Grandview Dr., Indianapolis 20, Ind.	Z
Roberts, Claude M., U. S. Geological Survey, 311 W. Washington St., Indianapolis, Ind.	G
Rosenshein, Joseph S., 34 S. Rangeline Rd., Carmel, Ind.	G
Salter, Lewis S., Wabash College, Crawfordsville, Ind.	Ph
Shallenburg, Mrs. John, Richmond Senior High School, Richmond, Ind.	
Shaner, Elizabeth L., 617 W. Lexington Ave., Fort Wayne 6, Ind.	Z
Singleton, Dr. J. R., Department of Biological Sciences, Purdue University, Lafayette, Ind.	Bo
Smith, Mrs. Fred S. (Elsa Holzwarth), 6840 Dover Rd., Indianapolis 20, Ind.	G
Stephenson, William K., Earlham College, Richmond, Ind.	Z
Van Dyke, Prof. George D., Earlham College, Richmond, Ind.	Ph
Vig, Reuben J., 3023 W. Morris, Indianapolis, Ind.	G
Wagenknecht, Burdette L., 1610 Francis St., Franklin, Ind.	Bo
Weber, Walter, 47 S. Pennsylvania St., Indianapolis, Ind.	E, Bo, C
Wrathall, James E., Department of Geography, Indiana University, Bloomington, Ind.	G
Zimmerman, Elaine, 344 W. Oak St., West Lafayette, Ind.	C

JUNIOR ACADEMIES

- Chesterton High School Science Club, Chesterton High School, Chesterton,
Ind.
- The Alchemists of Edinburg High School, Edinburg High School, Edin-
burg, Ind.
- George Washington High School Science Club, George Washington High
School, 2215 W. Washington St., Indianapolis, Ind.
- Science Club of Hamlet Jr.-Sr. High School, Hamlet School, Hamlet, Ind.
- Phi Chi Science Club, New Haven High School, New Haven, Ind.
- Science Club of Rossville High School, Rossville High School, Rossville,
Ind.
- Up and Atom Science Club of Sanborn High School, Sanborn High School,
Sanborn, Ind.

REPORT OF THE BIOLOGICAL SURVEY COMMITTEE

The symbols following the names of workers in this field have the following meaning: PP, published in the Proceedings of the Indiana Academy of Science, abstracts included; PE, published elsewhere; CP, maintains a personal collection, open for inspection—may be followed by location and scope; CI, maintains an institutional collection open for inspection, may be followed by location and scope; E, collection open for exchange; L, collection open for loan; B, maintains bibliography open for inspection—may be followed by scope; *, location of major collections in the field not maintained by members of the Academy. See Proceedings of the Indiana Academy of Science Vol. 61 for addresses of members. Inspection, exchange and loan of specimens and inspection of bibliographies are subject to reservations and conditions made by persons maintaining them. Institutions are indicated as follows: A.B.S.—American Bryological Soc. Herb.; A.M.N.H.—American Mus. Nat. Hist.; B.U.—Butler Univ.; B.S.T.C.—Ball State Teachers Col.; Buck. U.—Bucknell Univ.; C.N.H.M.—Chicago Nat. Hist. Mus.; C.U.—Cambridge Univ., England; D.U.—DePauw Univ.; E.C.—Earlham Col.; H.C.—Hanover Col.; H.U.—Harvard Univ.; I.D.C.—Ind. Dept. Cons., Dept. of Entomol.; I.N.H.S.—Ill. Nat. Hist. Surv. at Urbana; I.S.T.C.—Ind. State Teachers Col.; I.U.—Indiana Univ.; K.S.T.C.—Kas. State Teachers Col.; L. of O.—Lab. of Osteology, 707 Anita St., Bloomington, Ind.; M.B.G.—Mo. Bot. Gard.; M.N.H.—Mus. Nat. Hist., Paris, France; M.C.Z.—Mus. Comp. Zoology, Harvard Univ.; N.D.U.—Notre Dame Univ.; N.U.R.B.—Northern Utilization Res. Branch, U. S. Dept. Agr., Peoria, Ill.; N.V.H.S.—North Vernon High School; N.Y.B.G.—N. Y. Bot. Gard.; O.S.U.—Ohio State Univ.; P.U.—Purdue Univ.; P.U.A.E.S.—Purdue Univ. Agr. Exp. Sta.; R.U.—Rutgers Univ.; S.F.C.—St. Francis Col.; S.S.H.S.—South Side High School, Fort Wayne, Ind.; T.U.—Taylor Univ.; U.C.—Univ. of Cincinnati; U.K.—Univ. of Kas.; U.M.—Univ. of Mich.; U. of A.—Univ. of Alabama; U. of C.—Univ. of Calif., Citrus Exp. Sta.; U. of F.—Univ. of Fla.; U. of I.—Univ. of Ill.; U. of Ia.—Univ. of Iowa; U.S.D.A.—Nat. Mus., U. S. Dept. Agr.; U.S.N.M.—U. S. Nat. Mus.; V.U.—Valparaiso Univ.; W.C.—Wabash Col.; W. Va.—West Va. Univ.

BOTANY

Conservation

Smucker, Silas J. (Cultivated grasses, fungi; PE)

Cultivation

Starr, Richard C. (Algae; cf. Cytology and/or Genetics & Morphology; PE; CI, I.U., all algae that can be maintained in culture; E; * C.U. & M.N.H.)

Cytology and/or Genetics

Delisle, Albert L. (Aster; PP; PE; CI, N.D.U., fair; L; B, fair; * H.U.)

Farquharson, Lois I. (Maydeae, especially *Tripsacum* spp., cf. Morphology & Embryology)

Starr, Richard C. (Desmids; cf. Cultivation & Morphology)

Ecology

- Markle, Carrolle A. (Angiosperms cf. Taxonomy and/or Distribution)
McCormick, Jack (Higher plants; cf. Taxonomy and/or Distribution; PP; PE; CI, B.U., R.U.; B, vegetational and general botany)
Overlease, William R. (General; cf. Taxonomy and/or Distribution & Natural Science)
Plummer, Gayther (Caesalpinoideae, ecological life histories and silviphotogrammetry)
Potzger, John E. (Forest studies; cf. Taxonomy & Paleontology; PP; PE)
Stearns, Forest (Genera with weedy habits chiefly Plantago, Cirsium, Ambrosia, Amaranthus, Setaria and Triticum; cf. Taxonomy and/or Distribution; CI, P.U.A.E.S., small; B)
Wagner, Kenneth A. (Liverworts; cf. Taxonomy and/or Distribution)
Weber, Robert C. (Pteridophytes; cf. Taxonomy and/or Distribution)
Westmeyer, Paul (Chiefly trees; PP; CI, N.V.H.S., few)

Embryology

- Farquharson, Lois (Tripsacum; cf. Cytology and/or Genetics & Morphology)

Evolution

- Canright, James E. (Magnoliaceae & Annonaceae; cf. Morphology & Paleontology)
Just, Theodor (Gymnosperms & Angiosperms; cf. Taxonomy and/or Distribution, Morphology, Paleontology)
Weatherwax, Paul (Gramineae; cf. Morphology)

Forestry

- DenUyl, Daniel (Hardwoods and pines; PP; PE; B, biological aspects of Forestry)

Morphology

- Canright, James E. (Magnoliaceae & Annonaceae; cf. Evolution & Paleontology)
Farquharson, Lois I. (Tripsacum; cf. Embryology & Cytology and/or Genetics; PP; CP, I.U., seeds and living plants)
Just, Theodor (Gymnosperms; cf. Taxonomy and/or Distribution, Evolution, Paleontology)
Starr, Richard C. (Soil algae; cf. Cultivation & Cytology and/or Genetics)
Weatherwax, Paul (Gramineae; cf. Evolution; PP; PE; CP; CI, I.U., herbarium and living plants; B, general agrostology; *all large herbaria)

Natural Science

- Overlease, William R. (Popular approach, folk lore, uses, legends; cf. Taxonomy and/or Distribution & Ecology)

Pathology

- Goss, Robert C. (General; CI, P.U.; L)

Physiology

- Miller, Brinton M. (Mucorales, antibiotics of: CP: CI, P.U., viable

cultures: E, limited; B, beginning: *N.U.R.B.; Am. Type Culture Col., Wash., D. C.; Centralpurean vor Schimmelcultures, Baarn, Netherlands)

Pittenger, R. C. (Actinomycetes, industrial fermentations; cf. Taxonomy and/or Distribution)

Taxonomy and/or Distribution

Biological Survey Committee of the Ind. Acad. Sci., Chairman (B, general, incomplete)

Brown, Lucy (Deciduous and evergreen trees of N. A.; CP—not open for inspection but L, R#1, Vevay, Ind., 200 specimens)

Buser, Franklin B. (Embryophyta, mostly Fountain County; PP; CP, 149A Stadium Terrace, Champaign, Ill., U.S.; E)

Cottingham, J. O. (Fleshy fungi; PP; PE; CP, D.U.)

Cummins, George B. (Uredinales; PP; PE; CI, P.U.A.E.S., world; E; L; B, world)

Daily, Fay Kenoyer (Characeae: PP: PE: CP, B.U., world E: L: B, Ind.—published; published Ind. algae—file at B.U., basis of check lists by C. M. Palmer, now maintained by C. M. Palmer, W. A. & F. K. Daily—address remarks to latter: * C.N.H.M. & U.S.N.M.)

Daily, William A. (Myxophyceae; PP; PE; CP, B.U., general; E; L; * C.N.H.M. & N.Y.B.G.)

Fisher, T. Richard (Heliopsis and Silphium; PP; PE; CP; L; B, Compositae—Taxonomy, Genetics, Cytology & Biosystematics)

Heiser, Charles B., Jr. (Helianthus; PP; PE; CP & CI, I.U., Deam and I.U. herbaria; E; L; B, Helianthus; * U. S. N. M., M.B.G., etc.)

Jones, G. N. (Flowering plants and bryophytes; PE; CI, curator of herbarium; E; L; B, all plants)

Just, Theodor (Cycadaceae & other gymnosperms, Chenopodiaceae; cf. Evolution, Morphology & Paleontology; PE; CI, C.N.H.M., large, curator of herbarium; E; L; B, broad; * other large museum collections here and abroad)

McClung, L. S. (Clostridium, anaerobic bacteria; PP; PE; CP, I.U., one of largest in world; E; B, all phases, 1200-1500 articles per yr.; *Amer. and Nat. Type Culture Collections)

McCormick, Jack (Higher plants; cf. Ecology)

Markle, Carrolle A. (Angiosperms; cf. Ecology; CI, E.C., large; E)

Martin, Sister M. Celine (Flowering plants & insects; cf. Zoology, Taxonomy and/or Distribution; CP, S.F.C., very limited)

Overlease, William R. (General; cf. Natural Science & Ecology; CP, Elkhart, Ind., 500 specimens from Ind., Mich., Cal.; B, small)

Palmer, C. M. (Lemanea & Sacheria; PP; PE; CP; B)

Pittenger, R. C. (Actinomycetes; cf. Physiology; PE; *N.U.R.B.)

Potzger, John E. (Grasses; cf. Ecology & Paleontology; PP; PE; CP, B.U.; L; *B.U., N.D.U., U.S.N.M.)

Rector, Marion A. (Mrs. Ralph E.) (Pteridophyta; PP; CP, 500 sp., Delaware and surrounding counties; CI, extensive)

Sperry, Theodore M. (Vascular plants; CI, K.S.T.C., 200+ specimens; E; L)

- State Flora Committee, Ind. Acad. Sci., Chairman (Flowering plants—to supplement *Deam's Flora*; PP; CI—see published records; B, B.U.)
- Stearns, Forest (Plantago, Cirsium, Ambrosia, Amaranthus, Setaria & Triticum; cf. Ecology)
- Tryon, Rolla Milton, Jr. (Ferns; PP; PE; CI, M.B.G., world; L)
- Wagner, Kenneth A. (Liverworts; cf. Ecology; PP; PE; CI, D.U.: E?; L?; *A.B.S.)
- Ward, Daniel B. (Sisyrinchium; CI, W.C.; L)
- Weber, Robert C. (Pteridophytes; cf. Ecology; C.P., partly CI, S.S.H.S., incomplete, general; L; possibly; * U.M.)
- Welch, Winona H. (Fontinalaceae & Hookeriaceae; PP; PE; CP; CI, D.U., world; E; L; B, Ind.; * D.U., I.U., U. of I., C.N.H.M., larger herbaria throughout world)
- Yuncker, T. G. (Cuscuta; PP; PE; CP, CI, D.U., world; E, limited; L, limited; B, world; * Any large herbarium)

ARCHAEOZOOLOGY

- Adams, William R. (Vertebrates—osteological specimens particularly from archaeological sources; PP; PE; CP, L. of O., U.S. osteology; E; L; *Chicago, H.U., Wash.)

PALEONTOLOGY

- Bieber, C. L. (Cephalopods, stratigraphy; PP; CI, Greencastle, Ind.; E; L; B, limited; * I.U., U.S.N.M.)
- Campbell, Guy (Devonian-Mississippian, invertebrates & plants, stratigraphic distribution; PE; CP, Corydon, Ind.; E; L?; CI, H.C., Curator Geol. Mus., Paleozoic; E; B, Dev.-Miss.)
- Canright, James E. (Pennsylvanian Age flora—taxonomy, anatomy, distribution—both geographic and stratigraphic; cf. Botany—Evolution & Morphology; PP; PE; CI, I.U.; B, carbon floras, stratigraphy)
- Cross, Aureal T. (Paleozoic plants—morphology, taxonomy, stratigraphy; coal—origin, constitution, stratigraphy; PP; PE: CP: CI, W. Va. Geol. Sur. and Univ., general coal types of W. Va., gen. Paleozoic plants, gen. invertebrates of coal bearing rock: E: L:, possibly: * U.S.N.M.)
- Guennel, G. K. (Spores of Pteridophytes & Gymnosperms in coal—their distribution, taxonomy, morphology; PP: PE: CP: CI, Coal Sec., Ind. Geol. Sur., I.U.: E: L, probably: B, complete spore Bibliog.: *Urbana, Ill.; Ann Arbor, Mich.; Columbus, O.)
- Guernsey, E. Y. (Fossils in general; CP—on loan to County Museum, Bedford, Ind.)
- Hoskins, John H. (Lower Mississippian and Devonian, vascular plants: coal ball floras—morphology and taxonomy: PP: PE: CP: CI, U.C.: L, some: *Wash., D.C.; St. Louis; U. of I.)
- Just, Theodor (Cycadaceae, and other fossil gymnosperms; cf. Botany—Taxonomy and/or Distribution, Evolution, Morphology; PE; CI, curator at C.N.H.M., large; B, large; *other large museums here and abroad)

- Marshall, G. Edward (Fossils of St. Louis and St. Genevieve limestone—distribution and taxonomy; cf. Control; CP, Orleans, Ind., fossils of St. Louis limestone; E)
- Potzger, John E. (Pollen analysis; cf. Botany—Taxonomy and/or Distribution & Ecology; PP; PE; B)
- Wayne, William J. (Pleistocene land and fresh water gastropods—interglacial and interstadial migrations and extinctions of faunal elements; CP, Geol. Sur., I.U., small; B, partially complete; * U.M., U.K., O.S.U.)

ZOOLOGY

ANATOMY

- Rifenburgh, S. A. (Vertebrates; cf. Genetics; PP; PE; B, limited)

BIOLOGY

- Goodnight, Clarence J. (Arachnids—Opiliones; cf. Taxonomy and/or Distribution)
- Montgomery, B. Elwood (Odonata, bumblebees—pollinating activities; cf. Taxonomy and/or Distribution; CI, bees, P.U.; E; L)

COMMERCIAL

- Windsor, Alton S., Sr. (Commercial biology; PE; CI, Rt. 3, Bloomington, Ind.; L)

CONSERVATION

- Allyn, William P. (Reptiles & salamanders—amphibians; cf. Taxonomy and/or Distribution; PP; CP; B, not too complete; I.S.T.C.)
- Barnes, William B. (Game birds and mammals; cf. Taxonomy and/or Distribution; PE; B, limited)

CONTROL

- Deay, Howard O. (Homoptera, Hemiptera—reactions to electromagnetic waves and ultrasonics; cf. Taxonomy and/or Distribution)
- Marshall, G. Edward (Insects of apples, peaches, grapes, strawberries; cf. Paleobotany; PP; PE)
- Mizelle, John D. (Trematodes, Nematodes, Cestodes; cf. Taxonomy and/or Distribution, Morphology, Life History)
- Schuder, Donald L. (Coccoidea—scale insects; cf. Taxonomy and/or Distribution)

ECOLOGY

- Daggy, Tom (Coleoptera—largely immature forms; cf. Taxonomy and/or Distribution)
- Drummond, Roger O. (Mites; cf. Taxonomy and/or Distribution)
- Eberly, William R. (Isopods—terrestrial, crayfish; cf. Taxonomy and/or Distribution; PP; PE; CP, I.U., limited; E; L; B, of state, extensive; *Isopods—A.M.N.H., crayfish—U.S.N.M.)
- Garner, Murvel R. (Soil earthworms—effect on soil; cf. Taxonomy and/or Distribution; PE; B)
- Krekeler, Carl (Cave Carabidae—Coleoptera; cf. Taxonomy and/or Distribution)
- Lewis, Robert Earl (Insects and mammals; cf. Taxonomy and/or Distribution)

Mumford, Russell E. (Birds & mammals—bats; cf. Taxonomy and/or Distribution & Life History)

Tasker, Roy C. (Amphibia & fishes—salamanders; cf. Life History & Histology)

Williams, Eliot C. (Symphyla; cf. Taxonomy and/or Distribution)

Young, Frank N. (Dystiscidae; cf. Taxonomy and/or Distribution)

EVOLUTION

Sonneborn, T. M. (Paramecium; cf. Taxonomy and/or Distribution & Genetics)

GENETICS

Ford, Lee (Collie dogs—cytogenetics, breeding; PE; CP, Butler, Ind.)

Rifenburgh, S. A. (Vertebrates; cf. Anatomy)

Sonneborn, T. M. (Paramecium; cf. Taxonomy and/or Distribution & Evolution)

HISTOLOGY

Tasker, Roy C. (Amphibia and fishes—salamanders; cf. Life History & Ecology)

LIFE HISTORY

Cable, R. M. (Trematoda and their larvae; cf. Taxonomy and/or Distribution)

Mizelle, John D. (Trematodes, Nematodes, Cestodes; cf. Taxonomy and/or Distribution, Morphology, Control)

Mumford, Russell E. (Birds & mammals—bats; cf. Taxonomy and/or Distribution; Ecology)

Tasker, Roy C. (Amphibia & fishes—salamanders; cf. Ecology & Histology; CP, Buck. U., small; E; L; B)

Ward, Gertrude L. (Spiders, reptiles, snails & clams; cf. Taxonomy and/or Distribution)

MORPHOLOGY

Mizelle, John D. (Trematodes, Nematodes, Cestodes; cf. Taxonomy and/or Distribution, Life History & Control)

NATURAL HISTORY

Cooper, Robert H. (Locustidae—Serpentes; cf. Taxonomy and/or Distribution)

Minton, Sherman A., Jr. (Reptiles and Amphibians; cf. Taxonomy and/or Distribution)

PARASITOLOGY

Feldman, Harrison Lee (Helminths, Protozoa—drug screening & cultivation of several protozoa)

TAXONOMY AND/OR DISTRIBUTION

Allyn, William P. (Reptiles & salamanders—amphibians; cf. Conservation)

Ash, Charles R. (Insecta—Tingoidea—Hemiptera; PP in press; CP, U. of C., limited; E; L; B, limited; * Dr. Carl J. Drake, formerly of U. of Ia.)

Barnes, William B. (Game birds and mammals; cf. Conservation)

Barrett, John P. (Indiana Diptera only)

- Bell, Robert L. (Microsporidian; CP, home address, microscope slides; L)
- Biological Survey Committee of the Ind. Acad. Sci., Chairman (General; B, incomplete)
- Bushey, Clinton J. (Land gastropoda; PE; CP; CI, T.U., local; E; L; B, incomplete; * U.S.N.M., U.M.)
- Cable, R. M. (Trematoda and larvae; cf. Life History; PP; PE; CP, P.U.—not open for inspection but E & L, limited; B, incomplete; *U.S.N.M.)
- Cooper, Robert H. (Locustidae—Serpentes; cf. Natural History PP; PE; CP & CI, B.S.T.C., broad; * U.S.D.A.)
- Cope, James B. (Bats, Chickadees; PE; CI; E.C., large; E; L; B, as complete as possible; * C.N.H.M.)
- Daggy, Tom (Coleoptera—largely immature forms; cf. Ecology; PP; PE; CP; Davidson, N.C.; 20,000 beetles; E; L)
- Deay, Howard O. (Homoptera—Hemiptera; cf. Control; PP; PE; CI, P.U., Corixidae, Cicadellidae, Coreidae; L?; B, insects and partly complete for other families; * U.S.N.M., I.N.H.S., U.K.)
- Downie, N. M. (Coleoptera; CP, home address, 20,000+ specimens from U.S.A.; E; L; B, limited; *P.U.)
- Drummond, Roger O. (Mites, tree hole fauna at Shades St. Pk.; cf. Ecology; CP, with Dr. E. C. Williams, W.C.)
- Eberly, William R. (Isopods—terrestrial, crayfish; cf. Ecology)
- Garner, Murvel R. (Soil earthworms; cf. Ecology)
- Gerking, Shelby D. (Fishes; PP; PE; CI, I.U., all species of state; E; L; B, Indiana fishes; *all large museums of country)
- Goodnight, Clarence J. (Arachnids—Opiliones; cf. Biology; PP; PE; CI, A.M.N.H., world; E; L; B, inclusive; * M.C.Z.)
- Krekeler, Carl H. (Cave Carabidae—Coleoptera; cf. Ecology; CP, Valparaiso; E; L; B; *U.S.N.M., U. of A.)
- Lewis, Robert Earl (Insects and mammals; cf. Ecology; CP; CI, E.C., mammals; L; B, zoology)
- Macklin, Jerry M. (Arthropods—Hexaptera)
- Martin, Sister M. Celine (Flowering plants and insects; cf. Botany, Taxonomy and/or Distribution)
- Minton, Sherman A., Jr. (Mostly N.A. reptiles & amphibians; cf. Natural History; PP; PE; CP, reptiles and amphibians; E, limited; L; B, midwest herpetology; *U.M., C.N.H.M., U. of I. Nat. Hist. Mus., Chi. Acad. Sci.)
- Mizelle, John D. (Trematodes, Nematodes, Cestodes; cf. Morphology, Life History, Control; PP; PE; CP, N.D.U., monogenetic trematodes; E; L; B, parasitology; * U.S.N.M.)
- Mockford, Edward L. (Psocids—insects; PP; PE; CP, U. of F. temporarily, world; E; L; B, Psocids; * U.S.N.M., I.N.H.S.)
- Montgomery, B. Elwood (Odonata; cf. Biology; PP; PE; CP, home address, world; E; L; B, complete for world Odonata with specific and generic index; * U.M.—E. B. Williamson col.)

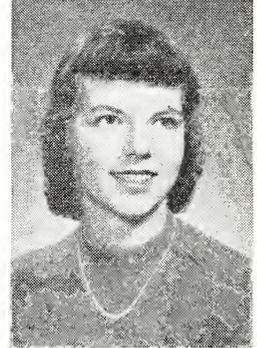
- Mumford, Russell E. (Birds & mammals—bats; cf. Ecology & Life History; PE; CP; CI, P.U., E.C., U.S.N.M.; E; L; B, as complete as possible; * U.S.N.M., P.U., C.N.H.M., E.C.)
- Schuder, Donald L. (Coccoidea—scale insects; cf. Control; PP; PE; CI, P.U.; E; B, Coccoidea; * I.D.C.)
- Sonneborn, T. M. (Ciliata—Paramecium; cf. Evolution, Genetics: PE: CP, I.U., world—living cultures of Paramecium: E: *Edinburgh, Scotland; Miami, Fla.; Los Angeles, Cal.; Philadelphia, Pa.; Oak Ridge, Tenn.)
- Ward, Gertrude L. (Spiders, reptiles, snails & clams; cf. Life History; PP; CP; CI, E.C.; E; L; B, limited; * C.N.H.M., A.M.N.H.)
- Williams, Eliot C., Jr. (Symphyla; cf. Ecology; CP, W.C., world; E; L; B, as complete as possible)
- Young, Frank N. (Dystiscidae; cf. Ecology; PP; PE; CP; CI, I.U., general; E; L; *U.M.)



LEROY KINSEY
Vice-President
Howe High School



JAMES DINCOLO
President
Adams High School



JANET GOLBA
Secretary
Adams High School

INDIANA JUNIOR ACADEMY OF SCIENCE

OFFICERS FOR 1954

President: JAMES DINCOLO, Adams Walton Club, John Adams H. S., South Bend.

Vice-President: LARRY KINSEY, Science Club, Howe H. S., Indianapolis.

Secretary: JANET GOLBA, Adams Walton Club, John Adams H. S., South Bend.

Members of the Council: Harold Stewart, Bloomington (1950-1954); Arthur L. Smith, South Bend (1951-1955); Charles E. Karst, Mishawaka (1952-1956); Edith Wallace, Gary (1953-1957); Jerry Motley, Indianapolis (1954-1958).

PROGRAM OF THE TWENTY-SECOND ANNUAL MEETING

Joint Meeting With the Purdue Sci-Math Assembly

October 16, 1954

Memorial Union Building

Purdue University, Lafayette, Indiana

- 8:30-10:00 a. m. Registration and Placement of Exhibits, South Ballroom, Memorial Union Building.
- 10:00 a. m. Career Conferences for High School Students. Science consultants available from biology, chemistry, mathematics, physics, agriculture, engineering, home economics and pharmacy of the Purdue University staff.
- 10:30 a. m. Project Clinic. Room 231. Opportunity for students to receive help from scientists on special projects.
- 11:00 a. m. Junior Academy of Science Business Meeting. Room 350, Memorial Union Building.
- 10:00 a. m.-12:00 a. m. Visits to Campus Laboratories and Shops.
- 1:30 p. m. The Assembly Program

Biological Sciences Section, James Dincolo, presiding.

1. A Diet Study of the Long-Eared Owl. Geoff Baker, New Castle High School, New Castle.
2. Breeding Bird Population Study. Lewis Nading, Shortridge High School, Indianapolis.
3. Biography of a Royal Moth. Joan Compton, Elkhart High School, Elkhart.
4. The Effect of Hormones on Root Production in Geranium Cuttings. Barbara Webster, Howe High School, Indianapolis.
5. Poisonous Snakes of Indiana. Bill Mitchell, Lew Wallace High School, Gary.
6. Preparing Mounted Skeletons. Jane Vogt and Luanne Schneider, Howe High School, Indianapolis.
7. Artificial Parthenogenesis of the Bull Frog. Nancy MacIvor, Adams High School, South Bend.
8. Medical Mycology. Robert Little, Howe High School, Indianapolis.
9. "The Acres," A Conservation Project. Raymond Kern, Central High School, Fort Wayne.
10. Urinalysis. Fred Green, Howe High School, Indianapolis.
11. A Comparison of Waters and Water Life of Southeast Ontario and Southern Indiana. John Clayton, University High School, Bloomington.

Mathematics Section, Allen Waltz, Linden High School, presiding.

1. Number Systems Other Than the Decimal System. Nancy Coleman, Bosse High School, Evansville.
2. Magic Squares and How to Make Them. Jerry Smith, Eastern School, Greentown.
3. Some Unusual Problems in Geometry. Larry Maxey, Duane Barts and James Rannie, Elston High School, Michigan City.

4. Primitive Pythagorean Triplets. Gary Gilmore, Griffin High School, Griffin.
5. Some Topological Twists. Tom White, Arsenal Technical High School, Indianapolis.
6. The Four-Dimensional Earth. Stanley Kaminski, Hammond High School, Hammond.
7. Curves Traced by a Compound Pendulum. Alex Alexandrow, Central High School, Fort Wayne.
8. The Binary Number System. Lisa Barrett, Hammond High School, Hammond.

Physical Sciences Section, Larry Kinsey, presiding.

1. Secondary School Program at the Roscoe B. Jackson Memorial Laboratory. Edward Lollis, Howe High School, Indianapolis.
2. Proposed Experiments with a Cathode Ray Tube. Thor Semler, New Castle High School, New Castle.
3. Effects of Heat on Strength and Microstructure of Steel. David Rasmussen, Howe High School, Indianapolis.
4. Twin-Elliptic Pendulum. Alex Alexandrow, Central High School, Fort Wayne.
5. Conquest of Space. Larry Rothrock, Bloomington High School, Bloomington.
6. Principle and Construction of a Van de Graff Generator. Robert Fassnacht, Central High School, South Bend.
7. Meteorology and Weather. Robert Shomo, Mishawaka High School, Mishawaka.
8. The Future Development of Science. William Rand, Chesterton High School, Chesterton.
9. The Solar Eclipse of June 30, 1954. Roger Cuffey, University High School, Bloomington.

MINUTES

The twenty-second annual meeting of the Indiana Junior Academy of Science was held as a combined session with the Purdue Sci-Math Assembly Saturday, October 16, 1954. Approximately 1,600 students, teachers and friends attended the day's science program in the Memorial Union Building of Purdue University.

A large collection of science projects and exhibits by high school students was displayed in the south ballroom of the Memorial Union Building.

At 10:00 a. m. Dean W. L. Ayres of the Purdue University School of Science, Education and Humanities addressed the students briefly in the exhibit hall. Dean Ayres encouraged students to continue their interest in science and mentioned some of the possibilities for scientific careers.

Following the talk students were given the opportunity to visit with specialists of the Purdue staff in various mathematics and science fields. Students were encouraged to ask questions and gain further information on careers in science.

The project clinic was another feature of the morning activities. High school students and sponsors were given an opportunity to discuss present and proposed science projects with university staff members.

Instructional and research laboratories of the University were open to visiting teachers and students from 10:00 a. m. to 12:00 noon. Members of the various departments were on hand to answer questions and explain procedures.

The annual business meeting of the Junior Academy of Science was held at 11:00 a. m. with President James Dincolo presiding.

Mr. Harold A. Stewart, chairman of the Junior Academy Council, announced that Robert Fassnacht, Central High School, South Bend, was named "best boy," and Nancy MacIvor, John Adams High School, South Bend, was chosen as "best girl" in science for 1954. The winners of these awards are selected on the basis of information submitted each year by sponsors of the Junior Academy clubs. Each of the students is given a year's membership in the American Association for the Advancement of Science.

The following officers were elected for the year 1955. President, Bob Conway, Science Club, Shortridge High School, Indianapolis; Vice-President, Paul Justus, Phy-Chem Club, Elmhurst High School, Fort Wayne; Secretary, Luanne Schneider, Science Club, Howe High School, Indianapolis.

Mr. Howard H. Michaud, State Sponsor, Purdue University, reported the selection of Mr. Jack Munsee, Science Club Sponsor, University High School, Bloomington, as a member of the Junior Academy Council. Mr. Munsee will replace Mr. Harold A. Stewart, Bloomington High School, whose term expired in 1954.

Mr. Michaud also mentioned briefly the splendid progress that has been made by the Junior Academy during the past year. Six new science clubs were added to the Junior Academy in 1954 as follows: Science Club, Chesterton High School, Chesterton, Mr. Robert McCord, Sponsor; The Alchemists, Edinburg High School, Edinburg, Mr. S. C. Harrell, Sponsor; Science Club, Hamlet High School, Hamlet, Mr. Lawrence Cushman, Sponsor; Phi-Chi Club, New Haven High School, New Haven, Mr. Keith Hunnings, Sponsor; Science Club, Rossville High School, Rossville, Mr. Martin Silverthorn, Sponsor; and the Up and Atom Club, Sandborn High School, Sandborn, Mr. Paul D. Carter, Sponsor.

There are approximately fifty high school science clubs enrolled in the Junior Academy and it is hoped that at least ten new clubs will be added in 1955.

The business session was adjourned at 12:00 noon.

The afternoon assembly program, starting at 1:30 p. m., was divided into three sections including biological sciences, mathematics and the physical sciences. The biological sciences section met in Room 350 of the Purdue Memorial Union building. James Dincolo, president of the Junior Academy, presided. Allen Waltz, Linden High School, served as chairman of the mathematics section in Room 363 and Larry Kinsey, Vice-President of the Junior Academy, conducted the physical sciences section in Room 340. A total of twenty-seven papers were read in three sections.

The joint meeting of the Junior Academy and the Purdue Sci-Math Assembly was the most extensive program ever offered to high school science clubs in Indiana. The large attendance proved that there is a growing interest in science.

The Junior Academy will hold its twenty-third annual meeting at Notre Dame University, October 15, 1955. Plans will be undertaken immediately to provide another worth-while program. High school science clubs and sponsors are urged to cooperate and participate by preparing papers and exhibits for the annual session.

INDIANA JUNIOR ACADEMY OF SCIENCE CLUBS

Fall 1954

<i>Town</i>	<i>School and Club</i>	<i>Sponsor</i>
1. Attica	H. S., Sci-Math (1949)	J. Claude Daugherty
2. Bedford	H. S., Science (1951)	Elmer Wright
3. Bloomington	H. S., National Scientific Honor Society (1931)	Harold A. Stewart
4. Bloomington	University H. S., Jr. Academy (1938)	Jack Munsee
5. Chesterton	H. S., Science (1954)	Robert McCord
6. Clayton	H. S., Jr. Academy (1951)	Howard C. Lewis
7. Crawfordsville	H. S., Up-N-Atom (1950)	David Wells
8. Edinburg	H. S., The Alchemists (1954)	S. C. Harrell
9. Elkhart	H. S., Jr. Academy (1940)	Mrs. Evelyn Wag- oner Miller
10. Fort Wayne	Central H. S., Biology (1940)	Iva Spangler
11. Fort Wayne	Central Catholic H. S., Albertus Magnus Science Club (1952)	Sister Mary Agnita S.P.
12. Fort Wayne	Elmhurst H. S., Phy-Chem (1935)	Ruth Wimmer
13. Fort Wayne	North Side H. S., Nature (1936)	Vesta Thompson
14. Gary	Calumet Twp. H. S., Science (1952)	Mrs. Catherine Dale
15. Gary	Edison H. S., Beaker Breakers (1949)	Mrs. Martha B. Connor
16. Gary	Lew Wallace H. S., Biology (1935)	Lola Lemon
17. Gary	Lew Wallace H. S., Klub Kem (1941)	Mrs. Helen McKen- zie
18. Gary	Tolleston H. S., Biology (1952)	Edith Wallace

<i>Town</i>	<i>School and Club</i>	<i>Sponsor</i>
19. Gary	Tolleston H. S., Future Scientists of America (1949)	Arthur Kline
20. Gary	Wirt H. S., Biology (1945)	Mrs. Frances Huddleston
21. Gas City	Mississinewa Joint H. S., Science (1936)	Roy McKee
22. Griffith	H. S., Science (1953)	George M. Bunce
23. Hamlet	H. S., Science (1954)	Lawrence Cushman
24. Hammond	Morton Jr. H. S., Science (1949)	Nancy Lou Ritter
25. Hobart	H. S., Science (1952)	Lola Stewart
26. Indianapolis	Shortridge H. S. Naturalist's Club (1947)	Max Forsyth
27. Indianapolis	Shortridge H. S., Science (1931)	Mrs. Henrietta A. Parker
28. Indianapolis	Technical H. S., Nature (1932)	Howard L. Cook
29. Indianapolis	Howe H. S., Science (1949)	Jerry Motley
30. Indianapolis	Washington H. S., Science (1931)	Estil Van Dorn
31. Lebanon	H. S., Jr. Explorers of Science (1953)	Helen E. Reed
32. Marion	Martin Boots Jr. H. S., Biology (1953)	John Clevenger
33. Mishawaka	H. S., Science (1936)	Darl F. Wood
34. New Albany	H. S., Science (1935)	L. S. Rose
35. New Castle	H. S., Science (1947)	Mary Rankin
36. New Haven	H. S., Phi-Chi (1954)	Keith Hunnings
37. Richmond	H. S., Science (1950)	Kathryn Coulter
38. Rossville	H. S., Science (1954)	Martin Silverthorn
39. Sandborn	H. S., Up and Atom (1954)	Paul D. Carter
40. South Bend	Central H. S., Jr. Izaak Walton (1939)	A. L. Smith
41. South Bend	John Adams H. S., Adams Walton (1953)	Ernest Litweiler
42. Sullivan	H. S., Camera (1939)	Ruth Hinkle
43. Terre Haute	State H. S., Senior Science (1939)	Russell McDougal
44. Valparaiso	H. S., Science (1931)	Gerald Doeden