PROCEEDINGS

of the

Indiana Academy of Science

Centennial Year

Founded December 29, 1885

•

Volume 94
1984

•

DONALD R. WINSLOW, Editor
Indiana University
Bloomington, Indiana

•

Spring Meeting
April 27, 28, 1984
Brookville, Indiana

•

Fall Meeting
November 1, 2, 3, 1984
Butler University
Indianapolis, Indiana

Published at Indianapolis, Indiana
1985

1. The permanent address of the Academy is the Indiana Academy of Science, 140 North Senate Avenue, Indianapolis, Indiana 46204.

2. **Instructions for Contributors** appear at the end of this volume.

3. **Exchanges.** Items sent in exchange for the *Proceedings* and correspondence concerning exchange arrangements should be addressed:

John Shepard Wright Memorial Library of the Indiana
Academy of Science
140 North Senate Avenue
Indianapolis, Indiana 46204

4. *Proceedings* may be purchased through the Library at $12.00 for each volume.

5. **Reprints of technical papers** often can be secured from the authors. They cannot be supplied by the Library nor by the officers of the Academy.

6. The Constitution and By-Laws reprinted from Vol. 74 are available to members upon application to the Secretary. Necrologies reprinted from the various volumes can be supplied to relatives and friends of deceased members by the Secretary.

7. Officers whose names and addresses are not known to correspondents may be addressed in care of the Library.

PUBLICATIONS AVAILABLE FROM THE ACADEMY

HISTORY OF THE INDIANA ACADEMY OF SCIENCE, Daily, W. A. and Daily, F.K.	$9.00 ppd
ECTOPARASITES OF MAMMALS OF INDIANA, John O. Whitaker, Jr.	$8.95 ppd
DISTRIBUTION OF THE MAMMALS OF INDIANA, Russell E. Munford	$3.00 ppd
VEGETATION OF THE LIFE ZONES IN COSTA RICA, John O. Sawyer & Alton A. Lindsey	$4.00 ppd
AMPHIBIANS & REPTILES OF INDIANA, Sherman A. Minton, Jr.	$6.00 ppd

Order from and make check payable to: Indiana Academy of Science. Send to Dr. Benjamin Moulton, Dept. of Geography and Geology, Indiana State University, Terre Haute, IN 47809.

TABLE OF CONTENTS

*Abstracts

Anthropology

Botany

*Abstracts

Cell Biology

Chemistry

*Abstracts

*Abstracts

Ecology

*Abstracts

Engineering

Entomology

*Abstracts.

Environmental Quality

Geology and Geography

History of Science

Microbiology and Molecular Biology

*Abstracts

Physics and Astronomy

*Abstracts

Plant Taxonomy

Psychology

*Abstracts

Science Education

Soil and Atmospheric Sciences

*Abstracts

Zoology

*Abstracts

Proceedings of the Indiana Academy of Science

Preface To The Centennial Volume

As President of the Indiana Academy of Science during this Centennial Year I am honored to introduce this volume of its Proceedings.

During this special year I found it valuable to think back over the last hundred years and to reconstruct what science must have been like over this period in general, but also more specifically within Indiana. How much scientific knowledge and insight do we take for granted today that did not exist even ten or twenty years ago, let alone in 1885? Moreover, what current methods and support resources simply were unknown or unavailable during the earlier days of our Academy?

Even more important than how much we have learned and grown is the realization that today each of us is related to the many scientists who have preceded us in the Academy. Moreover, all eleven hundred of us are the only link to the Academy's future. We join our past colleagues in the spirit of science and in the scientific endeavor at a time when our skills and dedication are needed more than ever throughout society. For science is an essential part of today's world, and will be in the future. Our knowledge and abilities can help alleviate many world problems, but they can also amplify them. Today we desperately need a continuously concerned scientific community as well as a scientifically literate society.

We stand on the threshold of the next hundred years of the Indiana Academy of Science. Let us dedicate ourselves even more deeply to advancing science in ways that also contribute to all the people of Indiana and the world!

Theodore J. Crovello,
President
Indiana Academy of Science

Indiana Academy of Science
Officers for 1984

President ..... Theodore J. Crovello
Department of Biology
The University of Notre Dame
Notre Dame, Indiana 46556
PHONE: (219) 239-7496
SUVON: ____ +736+7496

President-Elect ..... Benjamin Moulton, Professor Emeritus
Department of Geography & Geology
Indiana State University
Terre Haute, Indiana 47809
PHONE: (812) 234-3870
SUVON: ____+749+9+234-3870

Secretary ..... Richard L. Conklin
Department of Physics
Hanover College
Hanover, Indiana 47243
PHONE: (812) 866-2151, ext. 348
SUVON: ____+719+348

Treasurer ..... Duvall A. Jones
Department of Biology
St. Joseph's College
Rensselaer, Indiana 47978
PHONE: (219) 886-7111, ext. 214
SUVON: ____+741+214

Director of Public Relations ..... Walter A. Cory, Jr.
Coordinator for School Sciences
W. W. Wright 253
Indiana University
Bloomington, Indiana 47405
PHONE: (812) 335-5090
SUVON: ____+703+55090

Editor of *PROCEEDINGS* ..... Donald R. Winslow
School of Education 201A
Indiana University
Bloomington, Indiana 47405
PHONE: (812) 335-8658
SUVON: ____+703+58658

Committee Chairpersons and Special Appointments

I. Elected Committees

1. Academy Foundation Committee: WILLIAM A. DAILY, Chair (SUVON: ____+9+251-4719)
2. Bonding Committee: MARY LEE RICHESON, Chair (SUVON: ____+710+5546)
3. Research Grants Committee: UWE HANSEN, Chair (SUVON: ____+749+2429)

II. Standing and Ad Hoc Committees, and Special Appointments

4. Academy Representative to The American Association for the Advancement of Science: WALTER A. CORY, JR. (SUVON ____+703+55090)
5. Academy Representative to The Indiana Natural Resources Commission: DAMIAN A. SCHMELZ (SUVON: ____+8970)
6. Auditing Committee: JOHN A. RICKETTS, Chair (SUVON: ____+706+4607)
7. Biological Survey Committee: JOHN A. BACONE, Chair (SUVON: ____+9+232+4052)
8. Centennial Program Committee: JOHN B. PATTON, Chair (SUVON: ____+703+52862)
9. Constitution Committee: WILLIAM R. EBERLY, Chair (SUVON: ____+729+309)
10. Editorial Board for the Proceedings: DONALD R. WINSLOW, Chair (SUVON: ____+703+58658)
11. Emeritus Member Selection Committee: ROBERT H. COOPER, Chair (SUVON: ____+732+0+288-9068)
12. Fellows Committee: WILLIAM MELHORN, Chair (SUVON: ____+755+43277)
13. Financial Planning: FRANK GUTHRIE, Chair (SUVON: ____+739+312)
14. High School Teacher Research Fellows Committee: WALTER A. CORY, JR., Chair (SUVON: ____+703+55090)
15. Indiana Science Talent Search Committee: WALTER A. CORY, JR. Chair (SUVON: ____+703+55090)
16. Invitations Committee: DONALD J. COOK, Chair (SUVON ____+706+4601)
17. Junior Academy Council, Director: CHERYL MASON (PHONE: 219/924-7400)
18. Library Committee: LOIS BURTON, Chair (SUVON: ____+9+253+7798)
19. Membership Committee: DUVALL A. JONES, Chair (SUVON: ____+741+214)
20. Necrologist: FAY K. DAILY (SUVON: ____+9+251-4719)
21. Newsletter Editor: WALTER A. CORY, JR. (SUVON: ____+703-55090)
22. Nominations Committee: J. DAN WEBSTER, Chair (SUVON: ____+719+310)
23. Parlimentarian: CLARENCE DINEEN (SUVON: ____+743+4525)
24. Preservation of Natural Areas Committee: MARIAN T. JACKSON, Chair (SUVON: ____+749+2489)
25. Program Committee: PHILIP A. ST. JOHN (SUVON: ____+704+9411)
26. Publications Committee: BENJAMIN MOULTON, Chair (SUVON: ____+749+9+234-3870)
27. Resolutions Committee: WILLIAM DAVIES, Chair (SUVON: ____+710+5535)

28. Science and Society Committee: ALICE S. BENNETT, Chair (SUVON: ____ + 732 + 6875)
29. Speaker of the Year Selection Committee: RICHARD J. JENSEN, Chair (SUVON: ____ + 743 + 4674)
30. Youth Activities Committee: SUSAN M. JOHNSON, Chair (SUVON: ____ + 723 + 4043)

The Council

The Council consists of the officers plus the Chairperson of the Science and Society Committee.

Council Members for 1984:

THEODORE J. CROVELLO, President
BENJAMIN MOULTON, President-Elect
RICHARD L. CONKLIN, Secretary
DUVALL A. JONES, Treasurer
WALTER A. CORY, JR., Director of Public Relations
DONALD R. WINSLOW, Editor of *Proceedings*
ALICE S. BENNETT, Chair of Science and Society Committee

The Executive Committee

The Executive Committee consists of the past presidents, current officers, chairpersons of the sections, chairpersons of all committees, director of the Youth Activities Committee, and representatives of affiliated organizations.

For current Executive Committee membership, see parts of this Directory listing the above positions.

The Budget Committee

The Council:

THEODORE J. CROVELLO, President (and Chair of Budget Committee)
BENJAMIN MOULTON, President-Elect
RICHARD L. CONKLIN, Secretary
DUVALL A. JONES, Treasurer
WALTER A. CORY, JR., Director of Public Relations
DONALD R. WINSLOW, Editor of *Proceedings*
ALICE S. BENNETT, Chair of Science and Society Committee

Immediate Past President: ALICE BENNETT
Junior Academy Council Director: CHERYL MASON
Library Committee Chair: LOIS BURTON
Program Committee Chair: PHILIP A. ST. JOHN
Youth Activities Committee Chair: SUSAN M. JOHNSON

1984 Committees and Special Appointments

I. Elected Committees

1. Academy Foundation	William A. Daily, Chair (1985) John Ricketts (1984)
2. Bonding Committee	Mary Lee Richeson, Chair (1985) Donald Hendricks (1984)

3. Research Grants Committee
   Uwe J. Hansen, Chair (1985)
   Betty D. Allamong (1984)
   John H. Cleveland (1986)
   John O. Whitaker, Jr. (1987)
   James F. Newman (1988)

II. Standing and Ad Hoc Committees

4. Academy Representative to the American Association for the Advancement of Science: WALTER A. CORY, JR.

5. Academy Representative on the Indiana Natural Resources Commission: DAMIAN A. SCHMELZ.

6. Auditing Committee: JOHN A. RICKETTS, Chair (1984)
   ANDREW G. MEHALL (1983)

7. Biological Survey Committee: JOHN A. BACONE, CHAIR
   JAMES ALDRICH
   THEODORE J. CROVELLO
   JAMES R. GAMMON
   DONALD HENDRICKS
   PHILIP A. ORPUT
   VICTOR RIEMENSCHNEIDER
   HARMON P. WEEKS
   JOHN WHITAKER

8. Centennial Program Committee: JOHN B. PATTON, CHAIR
   ALICE S. BENNETT
   WALTER A. CORY, JR.
   FAY K. DAILY
   WILLIAM A. DAILY
   JOHN F. PELTON
   PHILIP A. ST. JOHN

9. Constitution Committee: WILLIAM R. EBERLY, CHAIR
   WILLIAM A. DAILY
   CLARENCE DINEEN

10. Editorial Board for the *Proceedings*
    DONALD R. WINSLOW, CHAIR
    HANS O. ANDERSEN
    RITA BARR
    ERNEST E. CAMPAIGNE
    DONALD P. FRANZMEIER
    JAMES R. GAMMON
    JAMES H. KELLAR
    BENJAMIN MOULTON
    JOHN F. PELTON
    CARL C. SARTAIN
    ALFRED SCHMIDT
    JOHN O. WHITAKER, JR.
    BERNARD S. WOSTMANN
    FRANK N. YOUNG

11. Emeritus Member Selection Committee:
ROBERT H. COOPER, Chair
HARRY G. DAY
HOWARD H. MICHAUD
WINONA H. WELCH

12. Fellows Committee:
WILLIAM MELHORN, (1985) CHAIR
STANLEY L. BURDEN (1986)
RICHARD CONKLIN (1984)
DELLA COOK ((1985)
CLARENCE DINEEN (1986)
JOHN J. FAVINGER (1984)
ROBERT HENRY (1985)
RICHARD JENSEN (1986)
JAMES G. LIST (1986)
ROBERT D. MILES (1985)
JOHN F. PELTON (1986)
RUSSELL K. STIVERS (1984)
EUGENE D. WEINBERG (1984)

13. Financial Planning Committee:
FRANK GUTHRIE, CHAIR
WILLIAM A. DAILY
DUVALL A. JONES
JOHN A. RICKETTS

14. High School Teacher Research Fellows Committe:
WALTER A. CORY, JR. Chair
ALICE S. BENNETT
ERNEST E. CAMPAIGNE
CHERYL MASON

15. Indiana Science Talent Search Committee:
WALTER A. CORY, JR., Chair
JO ANN JANSING
RICHARD A. MAYES
VAN A. NEIE
ALFRED SCHMIDT
HAROLD ZIMMACK

16. Invitations Committees:
DONALD J. COOK, Chair

17. Junior Academy Council:
CHERYL MASON, Director
WILLIAM T. ANDERSON, JR.
MICHAEL KOBE
VIRGINIA RHODES
CARROLL RITTER
LEOTA SKIRVIN
JANE TUCKER

18. Library Committee:
LOIS BURTON, Chair
JAMES A. CLARK
WILLIAM A. DAILY
JOHN F. PELTON

19.	Membership Committee:	Duvall A. Jones, Chair Robert H. Cooper Walter A. Cory, Jr. Marion Jackson Susan Johnson Jackson L. Marr William Melhorn
20.	Necrologist:	Fay K. Daily
21.	Newsletter Editor:	Walter A. Cory, Jr.
22.	Nominations Committee:	J. Dan Webster, Chair Alice S. Bennett William R. Eberly
23.	Parliamentarian:	Clarence Dineen
24.	Preservation of Natural Areas Committee:	Marion T. Jackson (1984), Chair James Aldrich (1986) John A. Bacone (1985) Carl H. Krekeler (1984) Carrolle Markle (Honorary) George Parker (1986) Victor Riemenschneider (1984) Robert C. Weber (1985) William Weeks (1986) Winona H. Welch (Honorary)
25.	Program Committee:	Philip A. St. John, Chair
26.	Publications Committee:	Benjamin Moulton, Chair Lois Burton Donald J. Cook Walter A. Cory, Jr. William Eberly Willis H. Johnson J. Dan Webster John O. Whitaker
27.	Resolutions Committee:	William Davies, Chair Edward C. Miller
28.	Science and Society Committee:	Alice S. Bennett, Chair William Beranek, Jr. Stanley Burden Lois Burton Walter A. Cory, Jr. Jon R. Hendrix Gene Kritsky Elden Ortmann John Pelton James Shuler Edwin R. Squiers Philip A. St. John Charles Wier Howard R. Youse

29. "Speaker of the Year" Selection Committee:
RICHARD J. JENSEN, Chair
STANLEY L. BURDEN
ROBERT E. HALE
THOMAS R. MERTENS

30. Youth Activities Committee:
SUSAN M. JOHNSON, Chair
LLOYD ANDERSON
JERRY COLGLAZIER
WALTER A. CORY, JR.
KARL KAUFMAN
MICHAEL L. KOBE
CHERYL MASON
VIRGINIA RHODES
JOHN A. RICKETTS
STANLEY SHIMER
LEOTA SKIRVIN
JANE TUCKER

IAS 1984 Section Chairpersons and Chairpersons-Elect

Chairpersons	Chairpersons-Elect
Anthropology	
DONALD COCHRAN Department of Anthropology Ball State University Muncie, Indiana 47306 (317) 285-4927	DIANE BEYNON Department of Anthropology Indiana University—Purdue University at Fort Wayne 2101 Coliseum Boulevard East Fort Wayne, Indiana 46805 (219) 482-5391
Botany	
PHILLIP E. POPE Department of Forestry Purdue University West Lafayette, Indiana 47907 (317) 494-3590	AUSTIN E. BROOKS Department of Biology Wabash College Crawfordsville, Indiana 47333 (317) 362-1400 ext. 350
Cell Biology	
RALPH JERSILD Department of Anatomy Indiana University School of Medicine Indianapolis, Indiana 46202 (317) 264-8730	ROBERT STARK Department of Zoology DePauw University Greencastle, Indiana 46135 (317) 653-4776
Chemistry	
SHANNON LIEB Department of Chemistry Butler University Indianapolis, Indiana 46208 (317) 283-9410	DENNIS G. PETERS Department of Chemistry Chemistry Building, Room A112 Indiana University Bloomington, Indiana 47405 (812) 335-9671

Ecology

Edwin R. Squiers
Department of Biology
Taylor University
Upland, Indiana 46989
(317) 998-2751 ext. 386

Richard W. Miller
Department of Zoology
Butler University
Indianapolis, Indiana 46208
(317) 283-9328

Engineering

David D. Chesak
Box 883
St. Joseph's College
Rensselaer, Indiana 47978
(219) 866-7111

William Stanchina
Department of Electrical Engineering
Notre Dame University
Notre Dame, Indiana 46556
(219) 239-5693

Entomology

Paul Robert Grimstad
Department of Biology
University of Notre Dame
Notre Dame, Indiana 46556
(219) 239-5493

James Haddock
Department of Biological Sciences
Indiana University-Purdue University
at Fort Wayne
2101 Coliseum Boulevard East
Fort Wayne, Indiana 46805
(219) 482-5254

Environmental Quality

William Beranek
Indiana Center for Advanced
Research
120 E. 38th Street
P.O. Box 647
Indianapolis, Indiana 46223
(317) 264-2827

Horst Siewert
Department of Natural Resources
Ball State University
Muncie, Indiana 47306
(317) 285-5790

Geology and Geography

Edward Lyon
Department of Geography
Ball State University
Muncie, Indiana 47306
(317) 285-1761

John Cleveland
Department of Geology/Geography
Indiana State University
Terre Haute, Indiana 47809
(812) 749-2833

History of Science

Gene Kritsky
Department of Biology
College of Mount St. Joseph
Mount St. Joseph, Ohio 45051
(513) 244-4401

Gerald Seeley
Department of Civil Engineering
Valparaiso University
Valparaiso, Indiana 46883
(219) 464-5120

Microbiology and Molecular Biology

J. R. Garcia
Department of Biology
Ball State University
Muncie, Indiana 47306
(317) 284-4045

Mary Lee Richeson
Department of Biological Sciences
Indiana University-Purdue University
at Fort Wayne
2101 Coliseum Boulevard East
Fort Wayne, Indiana 46805
(219) 482-5546

Physics and Astronomy

VINCENT A. DINOTO, JR.
Department of Physics
Indiana University Southeast
New Albany, Indiana 47150
(812) 945-2731 ext 390

RUTH HOWES
Department of Physics and Astronomy
Ball State University
Muncie, Indiana 47306
(317) 285-5494 or 285-6268—Dept.

Plant Taxonomy

MARION T. JACKSON
Department of Life Sciences
Indiana State University
Terre Haute, Indiana 47809
(812) 232-6311

VICTOR RIEMENSCHNEIDER
Department of Biology
Indiana University South Bend
South Bend, Indiana 46615
(219) 272-8262

Psychology

ROBERT FISCHER
Department of Psychological Sciences
Ball State University
Muncie, Indiana 47306
(317) 285-1713

Science Education

LINDA HAMRICK
The Canterbury School
5601 Covington Road
Fort Wayne, Indiana 46804
(219 432-7776

GARY DOLPH
Department of Botany
Indiana University at Kokomo
Kokomo, Indiana 46902
(317) 453-2000

Soil and Atmospheric Sciences

DAVID R. SMITH
Department of Geosciences
Purdue University
West Lafayette, Indiana 47907
(317) 494-3285

CHARLES L. RHYKERD
Department of Agronomy
Purdue University
West Lafayette, Indiana 47907
(317) 494-8101

Zoology

THOMAS FOGLE
Department of Biology
St. Mary's College
Notre Dame, Indiana 46556
(219) 284-4675

JAMES R. LITTON, JR.
Department of Biology
St. Mary's College
Notre Dame, Indiana 46556
(219) 284-4669 or 4671

HIGHLIGHTS OF THE SPRING MEETING

Photo courtesy of Whitewater Publications, Inc.

Members of the Indiana Academy of Science toured Brookville historical sites. John Newman, former Brookville High School teacher, (far left) conducted the tour.

Indiana Academy of Science
CENTENNIAL YEAR
HISTORICAL HIKE OF BROOKVILLE
Friday, April 27, 1984

At the forks of the Whitewater river, early in Indiana history, were located millstones. From these grew a town, strategically located to control and process produce coming down the forks from interior farms. Thus by August, 1808, Brookville was platted by Amos Butler and Jesse B. Thomas. Soon John Allen and Amos Butler were platting additions. Why such rapid growth? The forks of the Whitewater served as "roads" to hinterlands from Cincinnati in which settlers could venture north past the National Road, or west, towards Indianapolis. Brookville's location quickly drew Hoosier leaders and a Federal Land office. One can judge the prosperity of a town by its homes and public buildings. By 1819 log structures were being replaced by brick made at a factory located on the site of the high school, instead of being burned for each individual project. Yet with the removal of the land office to Indianapolis in 1825 depression hit Brookville; much land, and even James Brown Ray's home, was in the hands of the Bank of the United States at Philadelphia or in the hands of speculators. With the passage of the Internal Improvements Act in 1836, prosperity returned to Brookville with the building of the Whitewater Canal—new homes and businesses "*of permanent improvements.*" Such development began to wane by 1855 when the exodus of younger members of families for the "West" offset progress. The Civil War brought

industrialization to the United States and several new factories to Brookville, as barrel and paper making. The days of Scotus Gaul Picti, whose members believed that "Brookville was the greatest town on earth," caused the last business building boon in Brookville between 1890 and 1915. With the growth of urbanization, Brookville has more and more been left with her last greatest resources, her history.

To tour Brookville, then, is to do so on her terms—leisurely and curiously. Not to wonder why Governor James Brown Ray ever lived in Brookville, but to imagine his coming out of his home to greet you. Or not to mumble about the lack of parking places in town, but to wonder at the anger of the president of the Brookville National Bank for the livery stable customers next door who took all the bank customers' spaces at the hitching rail. Only then can Brookville's secrets unlock to reveal her uniqueness, fame and beauty.

1. *BRACKEN HILL*, in back of St. Michael's Church, was the site of a cabin built by John Allen, a co-settler of Brookville. Part of his second home, built about 1808, is still standing. Brick home was built by the Price family in 1837 and remodeled in 1937 by Al C. Brown. This home was long the residence of the Bracken family, William being a veteran of the Civil War and a regional politician.

2. *BIRTHPLACE OF LEW WALLACE*—Lew Wallace, soldier, statesman, and author was born in a home on this site, April 10, 1827. David Wallace, his father, was Governor of Indiana from 1837 to 1840. His mother, Esther Test, was the daughter of John Test, first Circuit Judge and Congressman. Marked by the Brookville Kiwanis Club.

3. *ST. MICHAEL'S CATHOLIC CHURCH,* First Catholic Church on this site in 1845. Present church dedicated March 25, 1862. St. Michael's School was founded in 1855. First school building, 1875. Present structure erected in 1913. Remodeled in 1956.

4. *SITE OF NOAH NOBLE HOME,* 353 High, was the residence of Noah Noble, governor of Indiana from 1831 to 1837. The original home became the Catholic rectory in 1863 and was moved across the square when the present rectory was built in 1882-1883. Later his home was torn down.

5. *JAIL AND SITE OF OLD YELLOW TAVERN*, 459 Main, in 1808 a blockhouse was erected which in 1811 was converted into a "tavern" and hotel by James Knight. After his death his wife, Mary, ran the tavern for many years. This structure was torn down in 1861 and in 1882-1884, the present jail was built here.

6A. *COURTHOUSE*, Fourth & Main, is the second brick and fifth courthouse used in Franklin County. The first was the "Yellow Tavern," on the site of the jail, then a log courthouse on the public square, then in 1816-17 James Knight built a brick structure which burned in February, 1852. The Lutheran Methodist Church on Fourth St. was rented as a courthouse until the present one was completed in 1855. This structure was extensively remodeled in 1912.

6B. *VALLEY HOUSE*, 450 Main, is on the site of the "Brookville Hotel," operated by Andrew Wallace, father of Governor David Wallace. This frame structure was destroyed by fire in 1852, and the present structure, the Valley House, was opened in December, 1852. This hotel is reputed to be the oldest continuously operating hotel in Indiana.

7. *COURT STREET*, in the rear of the Courthouse, contains buildings dating back to circa 1819. Many law offices, the office of the *Indiana American*, and a marble works, were located here in the 1840s through the 1870s.

8. *HISTORY OF LOT 37*, a business block burned out in February 1852. The buildings which burned give an idea of the development of Brookville in 1852.

9. *SITE OF OLD WHITE CORNER*, 501 Main, was the site of the store of Nathan D. Gallion, an early merchant of Brookville and competitor of Tyner.

10. *RICHARD TYNER HOME* AND SITE OF OLD GRINDSTONE CORNER, 512 Main, was the store and residence of Richard Tyner, an early merchant in Brookville. Since he continuously advertised grindstones, he acquired this name for this corner.

11A. *HITT-HOWLAND-FARQUHAR-GOODWIN* home - Probably built by John W. Hitt, father of George Hitt, Indianapolis newspaper editor, prior to 1840. Owned by John Howland, father of Hewitt Howland, former editor of *Harpers*; John H. Farquhar, Congressman and Lincoln elector in 1860; and three generations of the Goodwin family, John R., Charles F., and John P. Goodwin. Originally it was a story and a half house.

11B. *WILLIAMS-BUTLER HOME*, 911 Main, was built about 1820 for M.T. Williams. It is an excellent example of Federal style structure, with a recently added circular porch. It has long been the home of W.W. Butler, a leading naturalist and prison reformer in Indiana.

12. *O'BYRNE HOME*, 912 Main Street, was built in the late 1850s for Judge Wilson Morrow. This home is known as the home of three judges; in addition to Morrow, Judge Ferdinand F. Swift and Judge Roscoe C. O'Bryne have lived here.

13. *MATSON HOME*, 914 Main, was built in 1842-43 for John A. Matson, a businessman and Whig candidate for Governor in 1849. Matson lost the election locally since he described himself as a poor man (oh, those ideals of frontier democracy!) which contradicted the splendor of this home. His son, Courtland Matson, was a Democratic candidate for governor in 1888. Note the leaded glass in the doorway.

14. "*JAIL HOME*," 1032 Main, was built in 1852-55 by Henry H. Remy, of brick taken from the first brick courthouse, 1816, which burned in 1852, and the stone from the old stone jail. An unusual feature is a stone with a ring in it, to which prisoners were chained.

15. *RYAN-STOUT HOME*, 1038 Main, was built about 1878 in neo-Federal style. This building excellently preserved, reveals the prosperity of Brookville in the 1870s and 1880s with a large residence, a stone "cellar," a shed and carriage house stable.

16. *WILLHITE TOURIST HOME*, 1049 Main, was built in 1909 and is noted for its "Stained Glass Windows" on the North. There is cherry woodwork and doors which have hand carved designs on them. The home is also furnished with beautiful antiques.

17. *HEASOM-COOKSEY HOME*, 1001 Cliff was built for A.J. Heasom in 1881. Heasom, a Civil War veteran, was a local politician and merchant in Brookville. Note the footstone at the back door and the carriage house in the rear. A.J. Cooksey, a noted woodcarver and contractor, lived here from about 1906 to 1955.

18. *WILSON HOME*, 1023 Cliff Street, this property was originally platted June 23, 1875 by Mrs. Jane McCarty. In 1916 it was purchased by Furman W. Hathway who was a cigar manufacturer. In 1928 Fred and Ethel Rusterholz bought it and owned it until August 22, 1975 when it was purchased by the present owners.

19. *CHURCH OF CHRIST*, Tenth & Franklin. This church was built in 1917. This denomination was organized in Franklin County by Alexander Campbell in 1866.

20. *SITE OF THE BROOKVILLE COLLEGE*, Tenth & Franklin, on this site in 1819 was a brick factory. Later this two-acre site was transferred to the regents of Brookville College who built a three story brick on the site of the present older high school building between 1852 and 1855. This school was in use by the Methodists from

1855 to 1873, when it was sold to the town of Brookville for a public school building, and the building was razed in 1912.

21A. *JAMES BROWN RAY HOME*, Tenth & Franklin, was built probably in 1821, as Ray sold his home in September 1921 to William Noble: Lot 59: "on which stands the house in which I now live." Noble sold this property to the Bank of the United States in 1822, which James B. Lile, a teacher of the Franklin County Seminary, and later of Centerville, bought, in 1833, "one lot of land with an old frame building thereon called the Brookville Hotel on the north part of lot numbered thirty seven . . . and the other lot of land with the old frame house on it called the Ray home . . . being the same premises formerly occupied by Governor Ray and conveyed by him by deed dated 1-September 1821 to William Noble." The aristocratic frills on the building nearly cost Ray the election in 1825.

21B. *OLD BROOKVILLE CHURCH AND CEMETERY*, Tenth Street — was built in 1820-21 by the Methodists who held the property until 1830, selling it to the Presbyterians who controlled it until 1848, when the Lutheran congregation bought it. It was abandoned in 1923 and in the 1950s the Baptists held service in this church. The bell tower was added in 1873. In the 1960s this edifice was restored by the Franklin County Historical Society. The cemetery was first used in 1816 and was the only one until 1883 when Maple Grove Cemetery was opened.

22. *FRANKLIN COUNTY SEMINARY*—Fifth & Mill Streets, built in 1828-1831, is one of four such county seminaries still standing of sixty-five buildings erected in Indiana. It has been purchased by the Franklin County Historical Society for a museum.

23. *LUTHERAN METHODIST CHURCH*, Fourth & Franklin, was built in 1849 and was used as the courthouse from 1852 to 1855.

24. *VALLEY CHRISTIAN CHURCH*, 173 East Fourth Street, the first Christian denominations came to Franklin County at the turn of the century. The Valley Christians were established seventeen years ago and the present structure replaced a structure which burned in 1981.

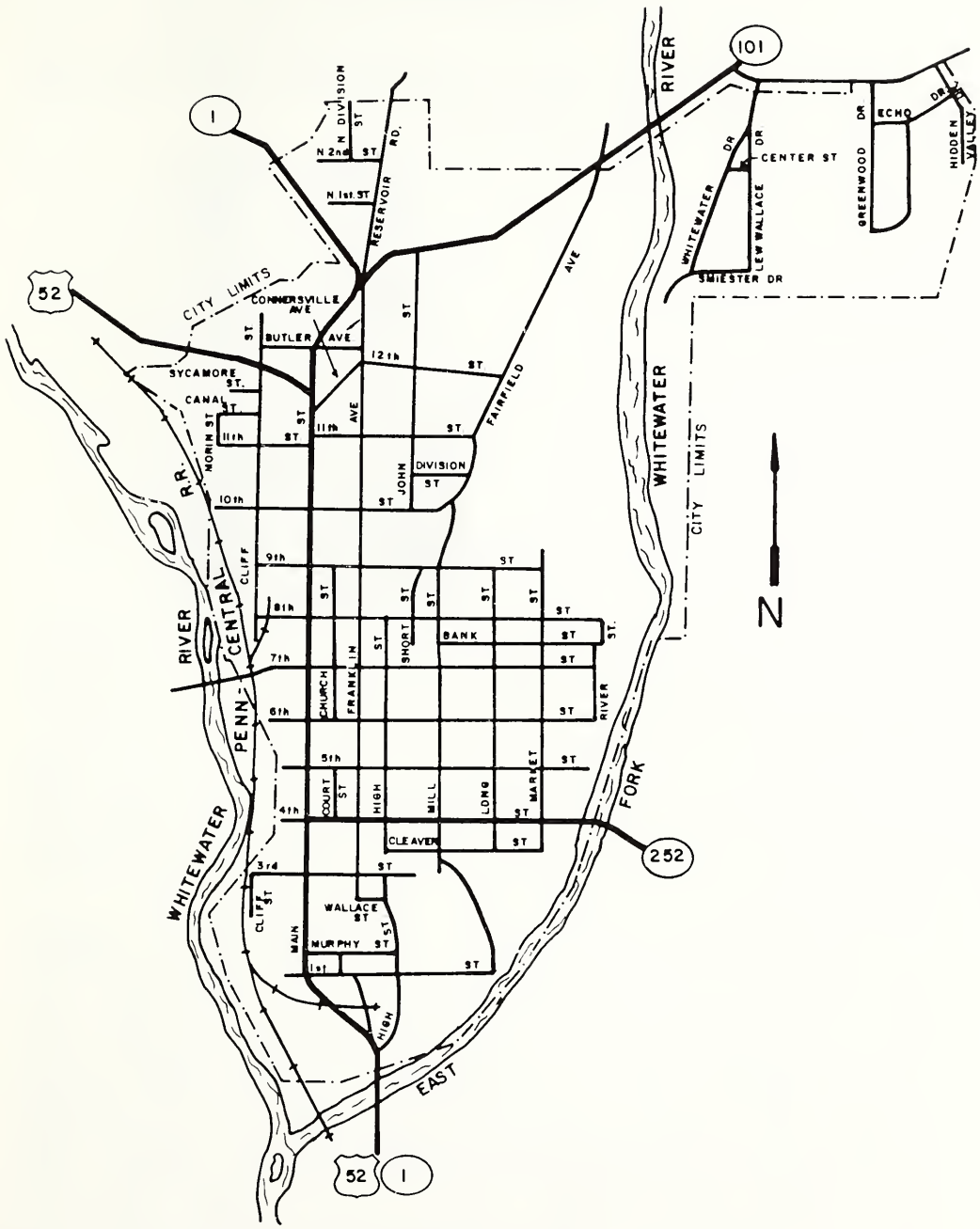
25. *FIRST CHRISTIAN CHURCH*, 123 East Sixth Street. The Christian denominations came to Franklin County at the turn of the century. The present structure was built in 1848 by the Methodists and sold to the Presbyterians and since 1960 has been renovated and used by the Disciples of Christ (First Christians) until the present time.

26. *BROOKVILLE UNITED METHODIST*, 150 East Eighth Street — The Goodwin family was instrumental in founding the Methodist denomination in Franklin County The present building was built in 1866 with an addition to 1927.

27. *ST. THOMAS LUTHERAN CHURCH.* Ninth & Franklin, built in 1920 and dedicated in 1924. The Lutherans first organized their church in Franklin County in 1848.

28. *LITTLE CEDAR GROVE BAPTIST CHURCH*—Oldest church on original site in Indiana. First services held August 1, 1812. Tradition says that a blockhouse was erected for protection while the church was being built. Clay for the bricks kneaded by oxen on this site. Restored by Franklin County Historical Society, the National Society of Colonial Dames of Indiana, and Franklin County, 1952-1955.

29. *THE HERMITAGE*, in back of the ball park, tour of the house and grounds. Oldest part was built by James Speer in 1817 and the wings were added about 1898. James Speer had a mill just to the southeast which was torn down in 1905. The Hermitage was the center of a Franklin County art colony, under the direction of J. Otis Adams and Theodore Steele at the turn of the century. Home was badly damaged in the 1913 flood.


101
1
52
252
CITY LIMITS
CONNERSVILLE AVE
BUTLER AVE
SYCAMORE ST.
CANAL ST
MORRIN ST
R.R.
CLIFF
RIVER
CENTRAL
PENN-
WHITEWATER
RESERVOIR RD.
FAIRFIELD AVE
JOHN
DIVISION ST
BANK
SHORT
FRANKLIN
CHURCH
COURT ST
HIGH
MILL
LONG
MARKET
CLEAVER
WALLACE ST
MURPHY ST
MAIN
EAST
FORK
WHITEWATER RIVER
CITY LIMITS
CENTER ST
WHITEWATER DR
LEW WALLACE DR
SMIESTER DR
GREENWOOD DR
ECHO DR
HIDDEN VALLEY
N

Our Brookville Bond

Fay Kenoyer Daily
Butler University
Box 169
Indianapolis, Indiana 46208

To start our centennial year, a return to the place where our society was conceived seemed appropriate to honor our founder, Amos Butler (Figure 1), who lived here, and to enjoy the beauty of this region.

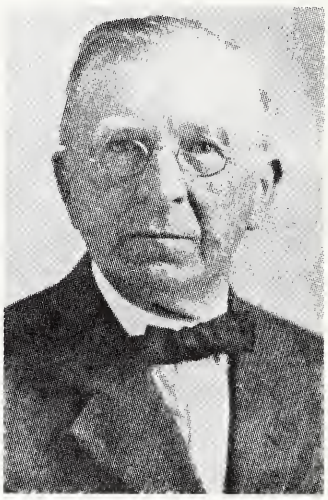


Figure 1. Amos William Butler.

Brookville was settled in 1804 by Amos Butler, Senior. His cabin was built just north of the Hermitage site, and he soon built a flour mill on the river bank nearby. In 1908, he platted Brookville with the help of Jesse B. Thomas. Many prominent men have lived here including Amos W. Butler, grandson of the senior A. Butler.

Amos William Butler was born in Brookville in 1860 and was educated in local schools. He attended Brookville College, Hanover College and Indiana University where he received an A.B. in 1894, M.A. in 1900, and L.L.D. in 1922. He received an L.L.D. from Hanover also in 1915. The Brookville College mentioned above used to be located on Main Street now the site of the Franklin County High School.

Butler was influenced early in life by the well-known naturalist, Dr. Rufus Haymond. As time passed, Butler found other members of the community interested in scientific subjects including Edgar Quick, Oscar Meynke, Charles F. Goodwin, Rev. David R. Moore and Clifford R. Case. The Rev. Moore arranged for lectures, some of which were scientific, in his Presbyterian Church. The lectures were so successful that Amos Butler discussed with the Rev. Moore the subject of forming a scientific society. Several people met at the residence of Rev. Moore in 1881 and formed the Brookville Natural History Society. The Rev. Moore was chosen president; Charles Goodwin, a banker, was vice-president; Amos Butler, secretary; Edgar R. Quick, editor of the *Franklin Democrat*, was correspondent; and John T. Rehme was treasurer. The group met over the stove store of Emerson Rockafellar for awhile. Evidently, Butler was co-owner of a tinning business with Rockafellar and Goodwin was influential in obtaining the Waltz Mansion for their later use. The Brookville National Bank owned the mansion and donated the parlor for a museum and meeting room. Many prominent Indiana scientists came to lecture at meetings. Among them were David S. Jordan, professor of zoology at Indiana University; John M. Coulter, Wabash College professor of botany; David Worth Dennis, professor of biology at Earlham College; John

P.D. John, president of Moore's Hill College; Barton W. Evermann, naturalist furthering his education at Indiana University at the time; and Stanley Coulter, botanist and conservationist, lawyer and teacher at Coates College.

Amos Butler did not confine himself to these scientific activities, however; he attended American Association for the Advancement of Science meetings where his circle of scientific friends expanded. It was at one of these meetings that he called a conference to discuss forming a state-wide organization. He had been corresponding with other Indiana scientists to see how they felt about it. In his words (2), "In my endeavor to obtain information on zoological subjects, I corresponded with a number of scientific men in the state. The results were often very unsatisfactory. I found the experience of other men the same; so I began thinking of some way to bring those interested in science in the state together to get acquainted and exchange experiences. To that end, correspondence was undertaken with John M. Coulter, Charles R. Barnes, Daniel Kirkwood, T.A. Wylie, David Starr Jordan, Stanley Coulter, R.B. Warder, Philip S. Baker, O.P. Jenkins, David W. Dennis, J.P.D. John, Richard Owen and others. Most of these gave favorable responses."

At an 1885 AAAS meeting, Butler met with a number of scientists who decided that the Brookville Natural History Society, as the most active society in the state, should call a state meeting of scientists. A committee should be appointed by the Brookville society to attend to the details of planning. The Rev. Moore, S.P. Stoddard and Amos Butler were appointed to the committee. Our Academy came into being December 29, 1885, at the Marion County Courthouse in Indianapolis, Indiana, with Dr. J.P.D. John of DePauw University presiding and Amos Butler as secretary. At the meeting, David Starr Jordan was elected president; J.M. Coulter, J.P.D. John and Rev. Moore as vice-presidents; Amos Butler, secretary; O.P. Jenkins, treasurer; and J.N. Hurty, librarian. Amos Butler presented a constitution which he had written. A faded pencil-written copy of it can be found in the Indiana Academy of Science files in our library housed at the State Library Building. The constitution was adopted with a few changes and charter members signed a roster attached finally to a typed copy of it. It was decided at the meeting that those persons who signed their names, had their names signed to the constitution and by-laws at this meeting or had requested that they be considered original members should be considered charter members. Evidently 46 persons attended the meeting judging by the signatures. Mr. W. de M. Hooper signed for Dr. Henry Jameson making 47 signatures at the meeting. Seven signatures were added by the treasurer with a notation, "by order of the executive committee" making 54 names of charter members. No later changes in this decision for determining charter members could be found in the minutes. The constitution and by-laws with the list of signatures were sent to the secretary, Amos Butler, on January 4, 1886, (less than a week after the meeting) by O.P. Jenkins, treasurer, with a letter signifying that these were the charter members. The letter became separated from the signature list and constitution. These and the minute books were unavailable for a period. They were all brought together and the charter members verified during the recent writing of an Academy history. The materials are all in the State Library Indiana Section archives now.

The first Indiana Academy of Science field meeting was scheduled the following May 20-21, 1886. In Butler's words (1), "It was fitting that the first 'Field Meeting' of the Indiana Academy of Science should be held at Brookville. There the idea of such an organization originated. There the steps were taken through the Brookville Society of Natural History by which scientific investigators of the state were brought together at Indianapolis, December 29, 1885, to adopt articles of association and effect an organization."

The Brookville field meeting participants assembled in the town hall for evening

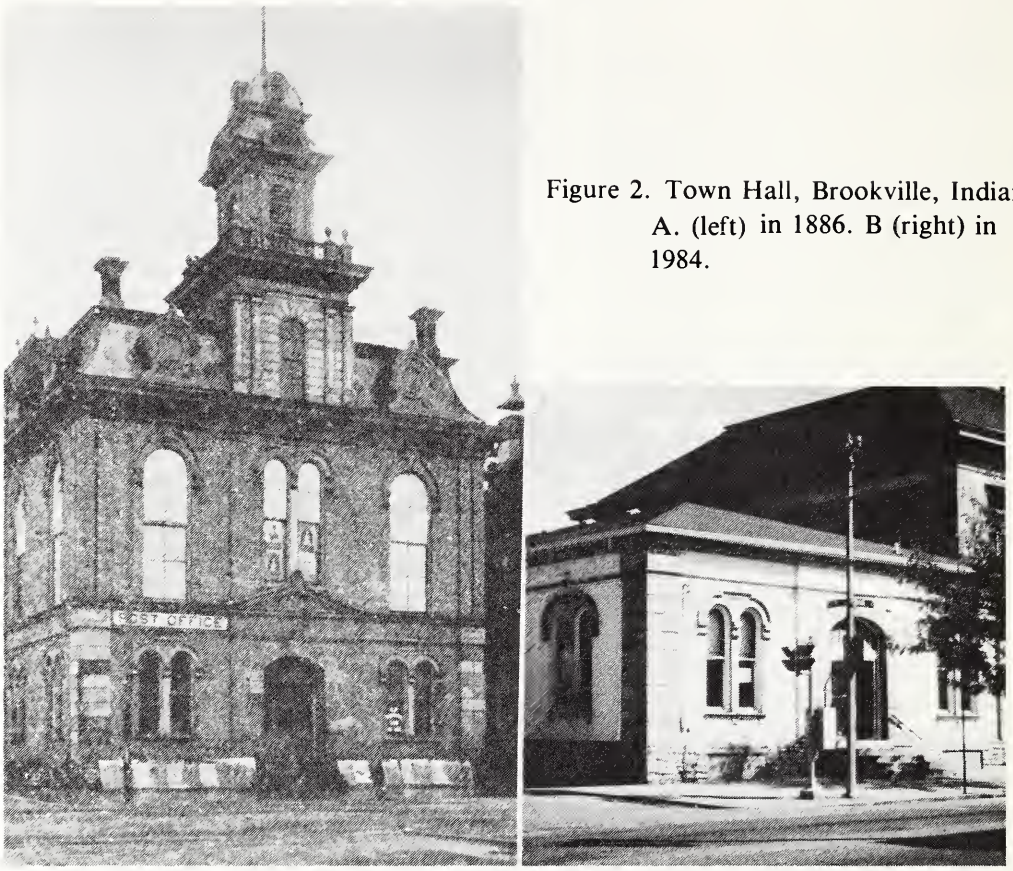


Figure 2. Town Hall, Brookville, Indiana. A. (left) in 1886. B (right) in 1984.

meetings. The hall as it appeared then is shown in Figure 2A. Figure 2B shows its present appearance without the upper story and steeple. It is located on Main Street by the courthouse between Fourth and Fifth Streets. It gave me a feeling of awe as I stepped into the halls to think that some of our charter members assembled there almost 98 years ago for a meeting. Amos Butler lists 33 people registered at that first spring meeting of our society. Among them were 15 charter members. With 7 new members taken in at that meeting, the Academy had 61 members at that time. Of that meeting Butler (2) wrote, "Some of us recall a few events of the first meeting—how disappointed we were that John Coulter was unable to be present for one of the principle addresses; how well his place was filled by David W. Dennis; that Evermann and others of the Indiana University crowd drove through in a carriage and on the way made a collection of fishes in the western part of Franklin County. We had no Kiwanis Club to make such splendid arrangements—but the Brookville Society of Natural History and its friends did the best they could. . . ."

Perhaps the next speaker will tell you more about that first field meeting as much of it involved our first president, David Starr Jordan. Suffice it to say, the meeting was a great success as was the second spring meeting in Brookville in 1923.

Some of the men mentioned here, many of whom were very young when the Academy was organized, became internationally known. Their fellowship and shared enthusiasm for their work and this organization, undoubtedly, had much to contribute to this. Amos Butler was not only known for his scientific pursuits, but they were interwoven into social work on the State Board of Charities. In the Academy, he served as secretary for the first eight years and later was president. In Dean Stanley Coulter's (3) memorial tribute to him, it was stated that, "The Indiana Academy of Science

came into being and was kept alive during its earlier years because he refused to allow it to die. It would not have been born, nor would it have lived, without Butler's genius for organization—."

Amos Butler was president in a number of other scientific organizations as well as the Academy. He not only was founder of this organization and the Brookville Natural History Society, but also eight more including the Indiana Audubon Society. There is a good biography of him by Dr. Barton W. Evermann (4) in the Indiana Audubon Society 1932 Yearbook dedicated to Amos Butler. His bibliography is included.

Our society did not return to Brookville for a meeting after 1923. With the growth of the society and lack of adequate facilities in Brookville, we came down as far as the Mary Gray bird sanctuary instead. We just had to strengthen our bond of fellowship, our Brookville bond, if you will, by returning here in our centennial year.

As Amos Butler said so eloquently at the end of his talk to members of the Academy the first time we returned here for a meeting in 1923, "Here we are back to the place where it originated—to Brookville—hail all hail." Or if you prefer today's vernacular, Hello out there, Brookville, we have returned!

Literature Cited

1. BUTLER, AMOS W. 1892. Field Meetings. Proc. I.A.S. (for 1891) 1: 9-13.
2. BUTLER, AMOS W. 1924. Early history of the Indiana Academy of Science. Proc. I.A.S. 33: 14-18.
3. COULTER, STANLEY. 1938. Memorial tribute to Dr. Butler delivered at the general session of the Academy, November 5, 1937. Proc. I.A.S. 47: 25.
4. EVERMANN, BARTON WARREN. 1932. AMOS WILLIAM BUTLER. Indiana Audubon Soc. Yearbook.

Gary A. Sojka and Fay K. Daily

The Making of David Starr Jordan

GARY A. SOJKA*
President, Bucknell University
Marts Hall, Lewisburg, Pennsylvania 17837

On May 21, 1886, the field meeting of the Indiana Academy was called to order at the town hall in Brookville. David Starr Jordan presided. At that meeting, Jordan presented two papers: one on Darwin and the other on "How To Go Fishing." In a later address, his presidential speech to the American Association for the Advancement of Science in 1910, Jordan talked on "the making of Darwin." He listed the elements that came together to influence Darwin and helped to prepare him for his great work. Among these were observations on Darwin's genetic makeup or his "inherent self," his contact with nature, and, finally, the influence of an inspiring teacher.

In discussing "the making of Jordan," I will examine these same elements. His

*At the time of this address, Gary Sojka was Dean, College of Arts and Sciences, Indiana University, Bloomington, Indiana 47405.

genetic and family background, of course, is no longer easy to analyze; consequently, I will place more emphasis on the events and mentors that shaped and influenced this pioneer educator, scientist, internationalist and pacifist.

Jordan was born in 1851 in Gainesville, New York, and was christened simply David Jordan. The Starr came later. He was the fourth of five children born of Puritan stock, originally from Devon. His grandfather fought in the Revolutionary War and his father, Hiram Jordan, was born in 1809, the same year as Lincoln and Darwin. He worshipped his older brother, Rufus Bacon Jordan, who was 13 years his senior. Rufus went off to Washington to enlist in 1862 and immediately contracted "Army Fever" and died. Jordan experienced deep and intense feelings of loneliness for years afterwards. He later stated that it was at the moment of hearing of his brother's death that he realized the terrible tragedy of war. Those feelings stayed with him throughout his life and he dedicated his 1907 book, *The Human Harvest*, which dealt with the biological effects of war, to his late brother.

In his childhood he invented for himself an imaginary hero that he named David Emanuel Starr. It was as a young adult that he added the middle name Starr—an act that gives some insight into the level of Jordan's self-esteem. As a boy growing up in a rustic environment, he developed interests in natural history. His earliest scientific observations were of the stars. He mapped the celestial bodies and endeavored to learn their names. By the age of 13 he had a complete set of handdrawn star charts. He next turned to terrestrial geography. He was fascinated by maps, and as a result, he longed to travel at a very early age. Apparently his first interest in zoology grew from his responsibility around the Jordan farm to tend the flocks. From his experience in caring for diseased sheep and from his brother's death, he developed a strong interest in the disease process and in infection. His first scientific notes were published in The Cornell newspaper, followed quickly by a botanical paper in the *American Naturalist* and a paper on hoof rot in sheep in the *Prairie Farmer*, all in 1871. In addition to his interest in microbiology and zoology, botany fascinated the young Jordan. While yet quite young he developed a scientific as well as an esthetic interest in the flora that surrounded him. He combined his cartographic and botanical interests and began to observe, record, and map the biota of different locales on and about the Jordan homestead.

At age 14, in his own words, "being considered a youth of promise and otherwise apparently harmless," he was admitted to the female seminary of Gainesville run by two young women recently come from Mount Holyoke. There he learned French, but his primary literary interest, not surprisingly, was Thoreau. It was during this time that Jordan first developed his life-long interest in baseball. The boys of the town organized a ball club called the Gainesville Suaves. They dressed the part with bright red pantaloons and accompanying oriental panache. It was in a baseball game that Jordan broke his nose in a violent collision while chasing a flyball. This accident produced his most distinctive physical feature as later portraits show. Baseball remained an important part of Jordan's entire life. He was involved early and seriously in the question of whether a curve ball actually changed its direction of flight or was an optical illusion. He also took great pride in being able to hit with what he considered remarkable power.

Jordan originally had planned to go to Yale University. However, he won a Cornell scholarship and he entered that new school on March, 1869, with $75.00 in his pocket. Cornell University was seven years old at that time. Significantly, he had the same $75.00 upon graduation three years later, thus proving that wealth was not needed to complete an education at Cornell as it would have been at other eastern schools of that era. This fit, of course, with Ezra Cornell's desire that a young man should be able to work his way through school, either through manual labor or help to the university.

By 1870, at the age of 19, he already had become a lecturer in botany. He was also a very clubby person. He lived at the Grove Boarding Club, became an early member

of Delta Espilon, and later joined the AAAS and Sigma Xi, which was founded at Cornell in 1896 with Jordan as a charter member. In his autobiography Jordan goes into considerable detail discussing the merits of the college fraternity system.

The early days at Cornell were marked by crude facilities and cramped quarters, but Jordan noted that they were characterized by a kind of enthusiasm and pioneer spirit that are hard to maintain in days of prosperity. "At the time we were all young together, freshman students, freshman professors, freshman president, without experience or tradition to guide or impede, but we had youth and we had truth and not even the gods have those," he observed in his autobiography. But, whatever were the conditions at Cornell, Jordan met the two persons who would prove to be his most influential teachers: Louis Agassiz from Harvard, a non-resident professor and the most famous naturalist of his time, and Andrew Dixon White, the young and vigorous president of the institution. Jordan later went to study with Agassiz who molded his views in science. White, the enthusiastic and energetic administrator, probably had a greater influence than any other person on Jordan as an educator. White's view on co-education and curriculum design greatly impressed Jordan. He became noted in these areas at both Indiana and Stanford, where one can still see the influence of White. White also put great emphasis on attracting outstanding scholars. Those he could not get on the Cornell payroll, he brought in as non-resident professors. Among them, in Jordan's time, were Agassiz and James Russell Lowell. Jordan appreciated the effect that such persons had on the young, serious scholar, so he endeavored to "bring in the masters" whenever he was in charge. The concept of developing strong and autonomous academic departments also derived from his Cornell experience.

Jordan majored in botany and minored in geology and zoology. He became competent in French, German, Italian and Spanish. He later added Norwegian and, in his own words, "some Chinese." Again, we see the interest in things international, for this language preparation would later make him a facile traveler in Europe. He left Cornell in 1872 with a Master of Science. His Master's thesis was on the "Wildflowers of Wyoming County in New York." In 1886, he also was awarded the Doctor of Laws degree from Cornell, which he declined because he didn't believe in honorary degrees.

Upon graduation he had to make a career choice between botany or sheep husbandry. He chose the former and took a $1,300 per year appointment at Lombard College in Galesburg, Illinois. This institution was later absorbed by the much larger and better endowed Knox College. On the way to Galesburg, he attended his first scientific society meeting. The AAAS was meeting in Dubuque, Iowa. One of America's great scientists, Asa Gray, was in attendance. Jordan was mightily impressed by the social and intellectual atmosphere. As noted, he later became the President of the AAAS, but it was this first meeting which clearly indicated to him that scientific meetings were a valuable exercise and ought to be regularly attended.

Jordan did not do well at Lombard, which he felt suffered from small and narrow thinking. He was probably fired, but, in any case, he left after one year. He next went to Appleton Collegiate Institute as principal. It was there that he turned to the study of fishes because of their relative abundance and ease of study. Appelton Collegiate Institute was then absorbed by the much larger Lawrence University.

From Appleton, he went to the high school in Indianapolis to be in charge of natural science. The following are his first impressions of the city of Indianapolis. "The capital of Indiana at first sight seemed singularly monotonous, being perfectly level and laid out in regular squares around a central circle. The streets, moreover, were lined with silver maple, a second-rate shade tree, which do not appeal to me. The people said I would learn to love the town; as a matter of fact, I did! Among other reasons because it contained an unusual number of clear-headed and broad-minded citizens." Among those good citizens were William Henry Harrison, James Whitcomb Riley, and Dr. William B. Fletcher,

a pioneer in the humane treatment of mental disorders.

In the summer of his first year at the Indianapolis high school, he was elected without warning, according to him, to the professorship of biology at the nascent Northwestern Christian University at Irvington. Before it even opened its doors, it was renamed Butler University. In 1878-79, a schism occured at Butler between those who wanted a progressive scholarly insitution tied to the main trends in American scholarship and those who wanted closer ties to the Christian Church. As a consequence, faculty began to leave. Jordan's colleague, A.W. Brayton, tried to secure a post at Indiana University. Jordan may have done a "Miles Standish" on his colleague by going to Bloomington to testify on his behalf. As a result of his efforts on behalf of his friend, Jordan, rather than Brayton, was offered the position at Indiana University. Jordan was very critical of what he found in Bloomington. He had little good to say of the clergymen who headed the place. It was rural and backwoodsy and suffered from a fixed curriculum. There were a few things that appealed to him, however. He had great respect for four of the faculty: Daniel Kirkwood, Theophilus Wiley, Elisha Ballantine, and Richard Owens. He also appreciated the "Bates School of Philosophy." It seemed there existed a unique and quaint situation in Bloomington for Henry S. Bates, the local shoemaker, who, though possessing little formal education, loved literature and philosophy and talking with students. Indiana University students could be found gathering around his shoeshop at various hours of the day and early evening discussing natural philosophy and literature among themselves and with the cobbler, "Professor" Bates. From the time Jordan joined the Indianapolis high school until the time he left for Stanford, he spent 17 years in Indiana. In that time he visited each of the 92 counties and claimed friends and acquaintances in each of them.

In the summer between his leaving Galesburg and the beginning of his appointment in Appleton, he went to Penikese Island to study with Agassiz, who had a wonderful, revolutionary idea for a summer school of science for teachers of science and natural history. The summer session was one response to the perception that there was a crisis in the schools concerning math and science education. This was the first educational experiment of its kind in the United States, and Jordan was privileged to be a part of it. The Penikese experiment was called the Anderson School of Natural History. The first class was composed of 35 men and 15 women living together in make-shift quarters and separated from each other simply by sheets and other cloth materials hung in the middle of the room. Agassiz felt that this was a missonary work of the highest importance because he believed he had gathered around him people who had great influence on the young of the nation.

Agassiz was a gifted observer and naturalist; he was not a Darwinian evolutionist, but rather a natural theologist. He tried to build a bridge between religion and science. He felt that his own studies were "just glimpses into divine plans," and that, as he noted in 1887, "Our task is complete as soon as we have proved His existence." Agassiz died the first winter after the Penikese summer. The Anderson School opened again the following summer, but this time under the direction of Louis Agassiz's son, Alexander. Jordan was again present. Mottos and slogans of Agassiz were printed on bed sheets and hung on the walls of the crude shelterhouse in an effort to try to make the presence of the master a little more real. Some of these slogans, such as "study nature, not books," "strive to interpret what really exists," "be not afraid to say I don't know," hung around the room. After the second summer, the Anderson School closed forever. Interestingly, 15 years later Jordan's student, Carl Eigenmann, took those banners from the walls of the crude shelterhouse to Woods Hole, the natural successor to the Penikese experiment.

It seems strange to us today that Jordan, so prominently remembered among the early Darwinists as a contributor to the modern evolutionary theory, should have been so keenly influenced by Agassiz, a believer in theistic evolution. However, at that time, there was a number of differing views on the formation and mutability of species, Darwin's

natural selection theory being only one of them. Natural selection was interpreted by the Darwinists of that time as gradual preferential survival of creatures with slight positive variations. Theistic evolution, as espoused by Agassiz and his followers, stated that variation occurs; however, it is not random but rather directed toward some purposeful end by a creator's will. Probably the greatest intellectual challenge to Darwinian natural selection at that time was Lamarckism. Only one aspect of Lamarck's earlier theory applies, of course, that being the inheritance of acquired characteristics. Interestingly, Lamarck's theory was put forth in the year 1809, the same year that Darwin, Lincoln and Jordan's father were born. In this theory, characteristics acquired in the lifetime of the organism are supposed to be passed on in some way to the offspring. Another prevalent idea of the day was orthogenesis—evolution consistently directed along a single path by forces originating within the organisms themselves. These involuntary trends were thought to unfold without reference to the demands of the environment. And, finally, there was the so-called mutation of significantly new forms. The mutations occur at random and are non-adaptive. In the late 19th century, mutations were thought to create new populations instantaneously which were separate and distinct from the originals, a rather different interpretation than we have today.

The following quotation describes the influence that Agassiz's teaching had on Jordan's intellectual development with regard to biological evolution:

> Agassiz had no sympathy with the prejudices exploited by weak and foolish men in opposition with Darwin's views. He believed in the absolute freedom of science and that no authority whatever can answer beforehand the questions we endeavored to solve. An attitude strikingly evidenced by the fact that everyone, especially trained by him, afterward joined the ranks of the evolutionists. He taught us to think for ourselves not merely to follow him. This, though I accepted his philosophy regarding the origin and permanence of species when I began serious studies in zoology, as my work went on there impermanence impressed me more and more strongly. Gradually, I found it impossible to believe that the different kinds of animals and plants had been separately created in their present forms. Nevertheless, while I pay tribute to Darwin's marvelous insight, I was finally converted to the theory of divergence through natural selection and other factors, not by his arguments but rather by the special facts unraveling themselves before my own eyes. The rational meaning of which he had plainly indicated. I sometimes said that I went over to the evolutionist with the grace of a cat the boy leads by its tail across the carpet.

All of Agassiz's students passed through a similar experience and most of them came to recognize that in the formation of every species, at least four elements were involved, those being the resident or internal factors of heredity and variation and the external or environmental ones of selection and segregation. Actually, by 1869, or 10 years after the publication of *The Origin of the Species*, acceptance of evolution was widespread and firmly established. What was in doubt, and still is, is the precise mechanism of evolution. Darwin favored sympatric natural selection: slow, gradual selection of better fit individuals in the population until a new species finally emerges, formed alongside the original which may or may not then become extinct. The modern synthesis with Mendelian genetics gave a mechanism for the insertion of variation into the scheme. However, the fossil record does not accord easily with his model since it appears more abrupt or punctuated. Darwin himself decried that fact and tried to explain it away by pointing out that the fossil record was probably incomplete. It was some of Jordan's work on minnows and darters and other non-migratory fish that first suggested the importance of geological isolation as a crucial factor of allowing the buildup of differentiating factors in the speciation process. This concept, which later became known as "Jordan's Law," has been incorporated in the modern theory of punctuated equilibrium.

In his years at Indiana University, Jordan continued to do field work on fishes. He involved students in his work and considered this as part of his teaching. Significantly, he never gave up that enterprise during his years as President at Indiana or Stanford. He always taught and carried on research. His interest in travel continued while at Indiana University. He spent a good deal of time on the West Coast doing a systematic study of the fishes of the Pacific Coast for the United States government. He also began to go regularly to Europe with students. His command of languages and his training as a naturalist made him an excellent tour guide for students. On one of his trips he and some of his students climbed the Matterhorn. This adventure gave him a popular subject for the numerous lectures that he gave around the state of Indiana. These frequent European visits also convinced him of the foolishness of protective tariffs. He tended to believe in a world community and once wrote a satiricial essay about protective tariffs. He attended international scientific meetings whenever possible, and ultimately brought great distinction to the fledgling Indiana University when he won the gold medal at the First International Fishes Congress, held in London in 1883, for his collective writings on the "Taxonomy of Fishes."

In 1884, Lemaul Moss resigned and Ballantine was made the acting president of Indiana University. Jordan succeeded him in 1885. He had to find money for new buildings, he had to battle the legislature for funds, and he had to convince the population of a backward state that a college education was worth having. Some things change only slowly.

Much of what he liked best about Cornell he brought about at Indiana. In 1881 as a faculty member, he tried to introduce a new curriculum with electives but he failed. In 1886, as President, he did away with a fixed curriculum and introduced a strong departmental system, electives and a major professor system for indepth study in the last two years. He often pointed with pride to Carl Eigenmann, who took biology instead of Latin in this new system, as one of the successful examples of his educational initiatives. Jordan made a major effort to expose students to the masters. He worked hard to assemble a fine faculty in Bloomington and, later, he hurt Indiana University badly when he took most of the best with him when he left for Stanford. He also tried to bring impressive and important personages to campus, not the least of those being the young naturalist, Theodore Roosevelt.

In the foregoing, I have made a modest attempt to find the elements in Jordan's background and experience that equipped him for his role as scientist, internationalist, antiwar advocate, and pioneer educator. There can be little doubt that both Stanford and Indiana Unviersity benefitted from the influence exerted on the young Jordan by Andrew Dixon White in his years at Cornell. It is also clear that Agassiz, though holding opposing views himself, set Jordan on the path to important scientific contributions. Jordan's early experiences with social and scientific societies made him a willing and able leader and developer of the important scientific and educational institutions springing up around him.

Perhaps one of the best indications of the power of these early influences on Jordan's subsequent career comes from an oft-told Jordan anecdote. It is said that Jordan always recognized the students at Indiana and called them by their given names. Some years after Jordan left Bloomington to be President at Stanford, an Indiana University graduate from the Jordan era was visiting in Palo Alto. As they strolled around the Stanford campus, Jordan nodded and smiled at the Stanford undergraduates as they passed by but he did not acknowledge them by name. When the I.U. man inquired about this, Jordan reportedly replied, "Every time I remember the name of an undergraduate, I forget the name of a fish." I wonder if Jordan also remembered an Agassiz quotation emblazoned on one of those bed sheets that Eigenmann later carried to Woods Hole: "The memory must not be kept too full or it will spill over."

Reference Materials

Days of A Man
The Eclipse of Darwinsim
Archives of Indiana University

Geology field trip, April 28, 1984
CURTIS H. AULT AND JOHN R. HILL, Leaders

About 15 geology enthusiasts traveled by car and van through the valley of the Whitewater River, along the historical Whitewater Canal, and among the wooded hills from Brookville westward past the old milltown of Metamora to view and examine the landforms and rocks that form the scenic region near Brookville. Bold topographic relief, the result of differential erosion of glacial deposits and bedrock, gives the Brookville area a rugged appearance that reflects the character and self reliance of both the founders and the present-day population of Franklin County.

Examination of the rocks exposed in the Derbyshire Quarry, about 15 miles west of Brookville, revealed qualities of the local bedrock that has given the region its reputation for durable building stone since the early 1800s. The flaggy limestone of the Laurel Member of the Salamonie Dolomite (Silurian) is now being quarried at Derbyshire for building stone that is used for veneer in Indiana and Ohio, and for crushed-stone aggregate for local use. Limestone of the underlying Osgood Member of the Salamonie, and the Brassfield Limestone (Silurian), which has a distinctive brassy color and coarse chrystallinity, are also quarried at the Derbyshire operation.

The overlying glacial deposits were evident along the field trip route, particularly as valley-train terraces flanking the Whitewater valley. About 15 feet of Illinoian or older till, containing at least one and probably two paleosols, are exposed above the bedrock in the Derbyshire quarry.

The small Derbyshire Falls, which was recognized in the early literature, is visible from the quarry, but the valley containing the falls appears to be in imminent danger of flooding or burial with waste overburden from the quarry. Participants of the field trip had the opportunity to ponder the alternative of placing the quarry at this locality to the eventual detriment of the scenic setting of the falls versus the possible greater cost of importing crushed stone from more distant points.

Mr. Charles Holzhause, a second-generation stone merchant, discussed the value and the use of a variety of building stone that he sells from his stone yard at Metamora. His building stone included several varieties of the Laurel limestone that we examined in the Derbyshire Quarry. Mr. Holzhause emphasized the use of a large number of rock types for different kinds of construction and to satisfy individual personal tastes. We expanded our concepts of how veneer and other building stone could be used and displayed and gained an appreciation for the effort and expense that go into this type of masonry.

All participants of the trip became avid paleontologists at the last stop, where a wide variety of fossils had weathered out of a 100-foot section of Dillsboro Formation (Ordovician). The fossiliferous Dillsboro is exposed at the Brookville Lake dam on the north side of Brookville and consists of thin blue limestone flags interbedded with shale. The limestone contains numerous fossils, and the common brachiopods *Rafinesquina* and *Platystophia*, the bryozoan *Hallopora*, and the cup coral *Streptelasma* are present in great abundance. Fragments and whole specimens of trilobites such as *Isotelus* are much less common but more exciting to find.

Heavily laden with fossil-bearing rocks, we reached the end of this most-satisfying centennial Academy field trip just as the rain began to fall. The timing couldn't have been better.

Ornithology field trip, April 28, 1984
WILLIAM H. BUSKIRK, Leader

The Ornithology walk at the Spring Meeting of the Indiana Academy of Science at Brookville ran from 6:00 to 8:00 a.m. and was attended by nine people. The trip visited an area along the scenic drive on the southeast side of the Brookville Reservoir. Numbers of migrant birds were seen or heard. This included Indigo Buntings, Ovenbird, Black-throated Green Warbler, etc. A highlight was the simultaneous sighting of both Scarlet and Summer Tanagers!

Zoology field trip, April 28, 1984
SHERMAN A. MINTON, Leader

The zoology field trip made 28 April in conjunction with the Brookville meeting was chiefly concerned with herpetology. The group assembled about 9 a.m. near Derbyshire Quarry and proceeded down Silliman's Hollow. Two-lined salamanders (*Eurycea bislineata*) and northern dusky salamanders (*Desmognathus fuscus*) were plentiful along the small rocky streams. Eggs of the former species were found. Long-tailed salamanders (*Eurycea longicauda*) were also noted in this habitat. Redbacked salamanders (*Plethodon cinereus*) were numerous in adjacent woodland along with smaller numbers of slimy salamanders (*Plethodon glutinosus*). Of special interest was the collection of a specimen of the ravine salamander (*Plethodon richmondi*). This species is known from only a few sites in extreme southeastern and east central Indiana and had not previously been recorded from Franklin County. Another interesting find was an adult salamander of the *Ambystoma jeffersonianum* complex. It has not been determined if it represents the diploid species, *jeffersonianum*, or the all-female triploid form, *platineum*. A large adult of the small-mouth salamander (*Ambystoma texanum*) also was taken. A few frogs, probably the green frog (*Rana clamitans*), were noted along the main stream in the hollow. Calls of the American toad (*Bufo americanus*) and spring peeper (*Hyla crucifer*) were heard. Box turtles (*Terrapene carolina*) were plentiful, and a pair was observed courting. Snakes observed included one adult and a juvenile black racer (*Coluber constrictor*), two adult ringneck snakes (*Diadophis punctatus*), an eastern garter snake (*Thamnophis sirtalis*), and a small juvenile of the banded watersnake (*Nerodia sipedon*). Most of these amphibians and reptiles were merely observed or released at site of capture after identification or photography. A few specimens were retained by John Iverson and Sherman Minton for deposition in museum collections.

Indiana Academy of Science
SPRING MEETING
OF THE EXECUTIVE COMMITTEE
April 27, 1984

MINUTES

President Theodore J. Crovello called the meeting to order at 4:00 PM in the Knights of Columbus Hall, Brookville, Indiana.

Minutes of the Executive Committee meeting of October 27, 1983, were approved as distributed.

TREASURER'S REPORT

Treasurer Duvall Jones distributed a report of the Academy's finances as of April 26, 1984:

1984 Income	$15,844.24
1984 Expenditures	13,787.23
Balance	
Academy Accounts	10,668.86
Administered Accounts	16,007.43
Total	$26,676.29

REPORTS OF ELECTED COMMITTEES

Academy Foundation Committee

William A. Daily, chairman, reported that on March 31, 1984, the Invested Income Account had a total market value of $118,548.84, of which $4,727.25 was spent on April 4 to assist in publication of the *Proceedings*. On March 31 the market value of the Foundation Account was $40,812.38 and the market value of the John S. Wright Fund was $716,729.99.

Research Grants Committee

Benjamin Moulton presented the report for Uwe Hansen, Chair. Academy Research Grants in the amount of $10,335 have been awarded. A list of the grants is appended to these minutes.

REPORTS OF STANDING COMMITTEES

Academy Representative to the AAAS

Walter Cory will attend the annual meeting of the AAAS and requests suggestions for ways the national organization might assist the Indiana chapter.

Academy Representative to Indiana Natural Resources Commission

Damian Schmelz reported some examples from the 77 items on the agenda of the April meeting of the Commission.

Constitution Committee

William Eberly, Chair, requested input from all committees and officers on ways that current practice differs from statements in the Constitution. The Committee plans to have a proposed revision of the Constitution in the hands of members 30 days before the Fall meeting of the Academy.

Emeritus Members Selection Committee

Robert Cooper, Chair, recommended that the following members be granted Emeritus status:

Dr. Francis D. Hole, Madison, WI
Dr. R. Emerson Niswander, North Manchester, IN

The recommendation was approved.

High School Teachers Research Fellows Committee

Walter Cory, Chair, reported that two Fellows have been accepted for Summer 1984. They are being encouraged to present papers at the Fall meeting.

Indiana Science Talent Search Committee

Walter Cory, Chair, reported that of 42 entrants, 25 were selected as finalists and 13 of those were declared winners. Kappa Kappa Kappa provides funding for the finals in the competition and for two $1000 scholarships.

Invitations Committee

Walter Cory reported that the 1985 meetings will be hosted by Indiana University, Bloomington. The Spring meeting will be at Brown County State Park on April 26-27. The Fall meeting will be on the Bloomington campus on November 15-16.

No meeting sites have been selected for 1986 and beyond.

Junior Academy Council

Susan Johnson reported that the Spring meeting of the Junior Academy is in progress at Hammond.

Cheryl L. Mason has replaced Leota Skirvin Smith as Director of the Junior Academy.

Library Committee

Lois Burton, Chair, reported that Volume 92 of the *Proceedings* has been distributed to 683 Academy members and science clubs. 205 copies have been sent to libraries, institutions, and scientific societies.

The "Requisition for Printing" for Volume 93 was submitted to the Department of Administration on March 20. 825 cloth bound and 525 paper bound copies will be printed. The amount to be paid by the State will be $8900.

Membership Committee

Duvall Jones, Chair, reported 604 paid memberships as of April 26, with 420 on file from 1983 not paid for 1984. 111 members and clubs were dropped for nonpayment of 1983 dues; some of these have now been reinstated.

A member has asked if the $300 dues for Life Membership might be paid in three $100 annual installments. There was no immediate objection, but a discussion ensued of that question and the related one concerning the use of Life Membership dues as sources of income through interest. President Crovello recommended that the matter be referred to the Financial Planning Committee.

The question of exchanging membership lists with other organizations as a possible way of promoting membership was raised. Current policy is that this is not done unless in some specific case it is deemed advantageous.

Newsletter Editor

Walter Cory reported that the Spring Newsletter had not appeared because of administrative problems in his office. Absence of the Newsletter has led to confusion among the Section Chairs concerning the Call for Papers for the Fall meeting.

It was agreed that instructions should be given to a person as soon as he or she becomes Chair-*Elect*. A meeting for incoming Chairs and Chairs-Elect should be considered as part of the agenda for the Fall meeting.

Program Committee and Centennial Committee

Philip St. John, Program Chair, reported that details of speakers and program for the Fall meeting at Butler University are in progress. Edwin Squiers, Ecology Chair, said that his section is planning a poster session describing graduate programs offered by universities in Indiana, and suggested that other sections might consider this. As part of the Centennial observation, sections are encouraged to solicit papers about the histories of their disciplines in Indiana.

Publications Committee

Benjamin Moulton, Chair, reported that Academy monograph sales have been responding to promotional efforts. The Centennial volume is at the publisher, and a special cover has been designed.

Jones and Burton asked if the price of back issues of monographs should be increased to cover increased costs of production and mailing.

Resolutions Committee

President Crovello called for suggestions for special resolutions in connection with the Centennial observance.

Science and Society Committee

Alice Bennett, Chair, presented the report.

The Committee is implementing its responsibility to relate to State government through the participation of several of its members on the Task Force on Science and Education. Its goal is to provide recommendations for ways of improving scientific literacy and capabilities of Indiana citizens.

The second responsibility of the Committee is to provide a means for the dissemination of information to the people in Indiana. It is planning to arrange for the Fall meeting a symposium on the topic of Artificial Intelligence. If possible, the proceedings will be published in cooperation with the Publications Committee.

Gene Kritsky of the History of Science section is preparing an important collection of portraits of Charles Darwin. It is possible that funds from the Science and Society budget might be used to assist in the preparation and display of the collection, and that it be exhibited at the Fall meeting.

Youth Activities Committee

Susan Johnson, Chair, reported on the Junior Academy and the Science Talent Search, and participation in the International Science Fair. The Committee is pursuing plans for public recognition of outstanding science teachers and for a workshop for science teachers on the topic of science clubs and research in the schools.

The meeting was adjourned at 5:15 p.m.

* * * * * * * * *

Following a buffet dinner two talks appropriate to the Centennial theme were presented:

Fay Kenoyer Daily told of the group of scientists who gathered in Brookville one hundred years ago to found the society that grew into the Indiana Academy.

Dean Gary A. Sojka of Indiana University traced the life of David Starr Jordan, a giant in the early history of the Academy and the University.

A good number of people joined on Saturday in field trips into the surrounding countryside.

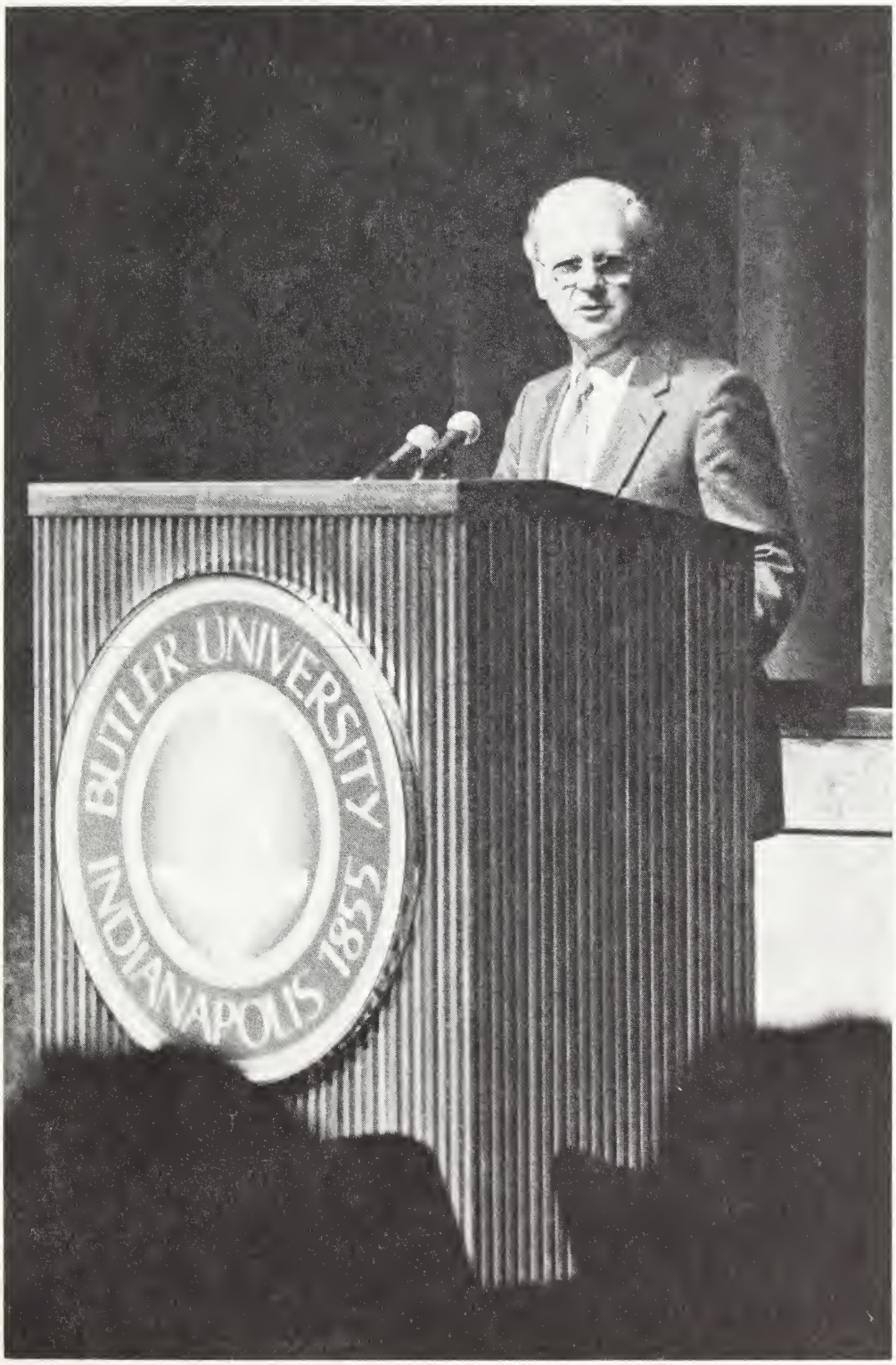
Respectfully submitted,
Richard L. Conklin, Secretary

Indiana Academy of Science
Spring, 1984, Grant Applications Funded

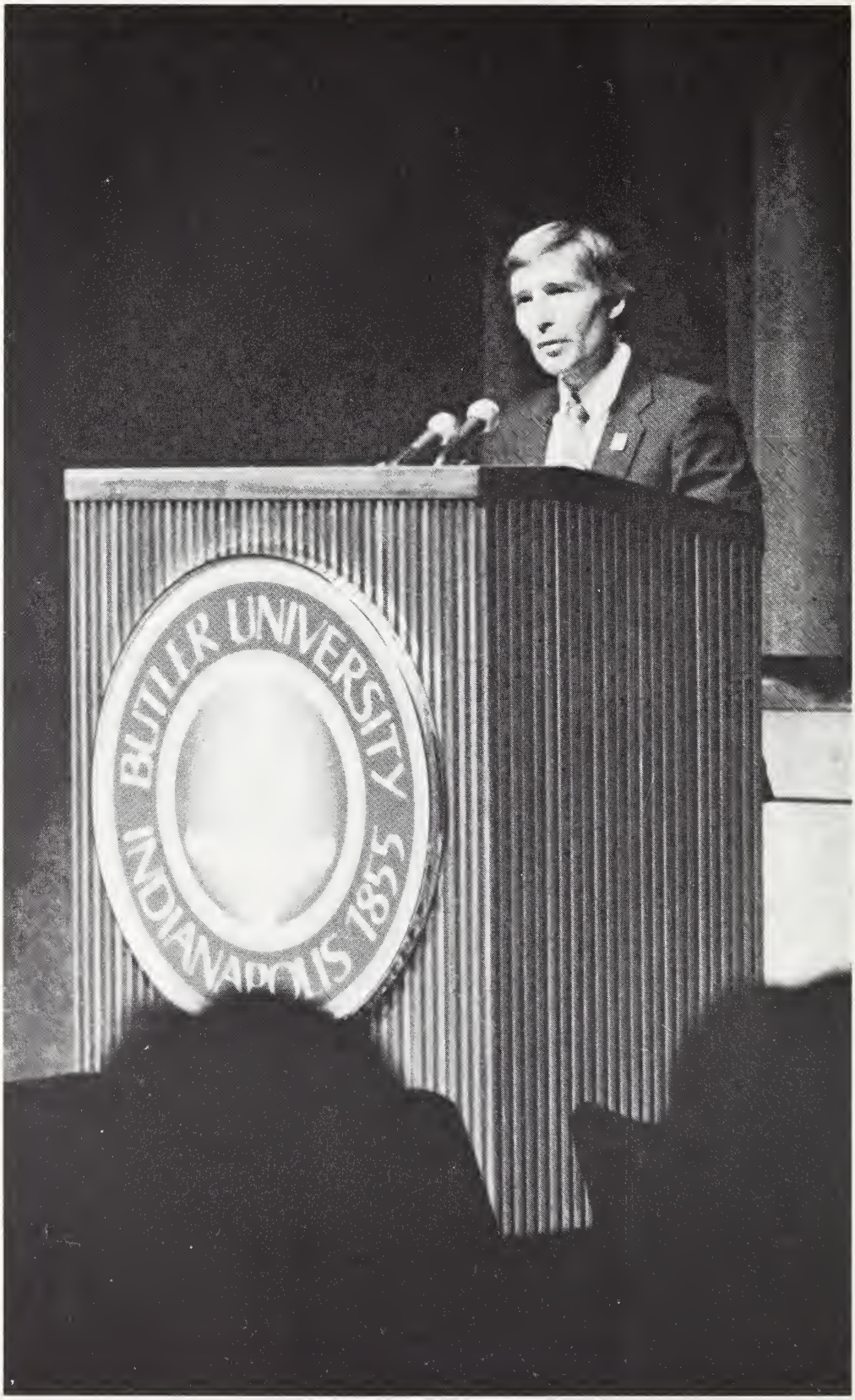
Research Grants Committee Actions

No.	Principal Investigator/ Institution & Dept.	Title	Funded
1	Mark Binkley ISU Geography	Base Study for the Development of a Synoptic Climatology . . .	$ 500.00
2	S. Cortwright IU Biology	The Role of Predation and the Meta-community in the Community . . .	550.00
3	S.W. Dhawale IU East Chemistry	Corrosion of Some Copper Alloys and Metals in Thiosulfate . . .	550.00
4	R. Faflak ISU Geology	Quaternary Stratigraphy and Chronology of Terraces . . .	470.00
5	H. Feldman IU Geology	Spatial Distribution of Macrofauna & Paleoenvironmental . . .	370.00
6	S. R. Ferson State U of NY	Ecotones between Eastern Hemlock Communities and Surrounding . . .	600.00
7	B. Fuchs ISU Life Sc.	Beta-Adrenergic Receptors in Muric Splenic T Lymphocytes	750.00
8	J. Hengeveld IU Biology	The Adaptive Significance of Brood Reduction . . .	700.00
9	M. A. Hughes IU Biology	Cold-Temperature Activity in Two Freshwater Turtles . . .	400.00
10	Ralph Joyner BSU Chem.	Insertion Reactions of Tin and Germanium Phthalocyanines	450.00
11	R. Doug Lyng IUPU Ft. Wayne Bio	A Preliminary Investigation on Using Cultured Mouse . . .	570.00
12	Robert Pinger BSU Bio	Serology Survey of Selected Indiana Vertebrates . . .	650.00
13	A. Roux Notre Dame Bio	Microdistribution of Trichoptera Populations in Juday Creek	650.00
14	Curtis Tomak In Dept Highway	Archaeological Research at Alton Site	900.00
15	Rod Walton IU Biology	Factors Influencing the Distribution of the Goldenrod . . .	450.00
16	Wm. Wilson ISU Geology	Lithologic and Base Level Controls on Cavern Positions . . .	800.00
17	Licia Wolf IU Biology	Biparental Care in the Monogamous Dark-eyed Junco; . . .	975.00
		TOTAL	$10,335.00

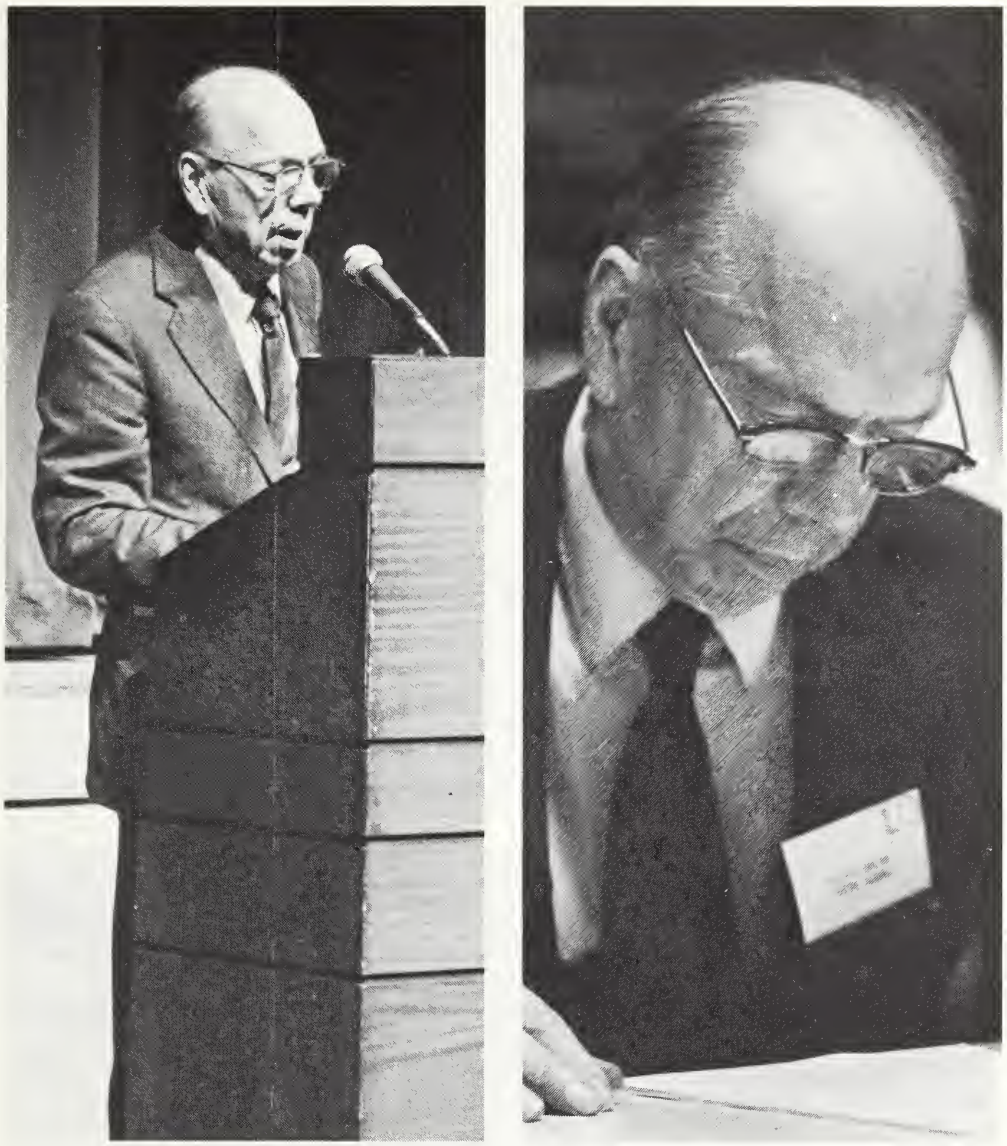
PICTORIAL HIGHLIGHTS
OF THE FALL MEETING



Welcome to Butler University, Clowes Hall. John G. Johnson, President, Butler University.

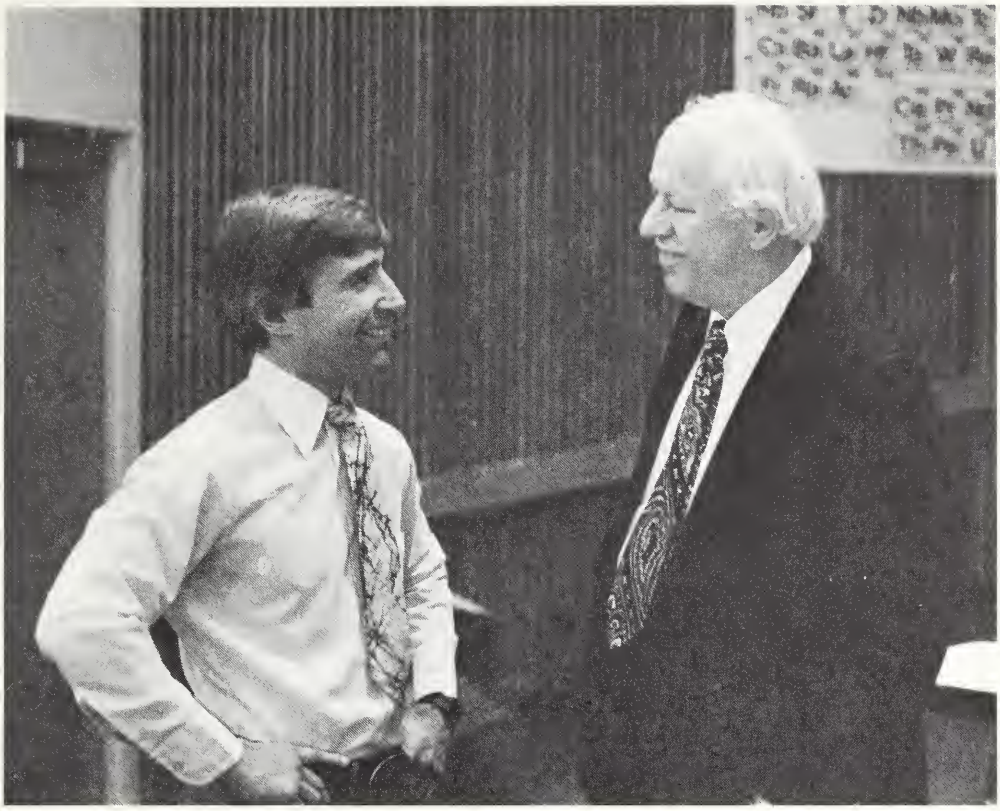


Welcome to the Fall Meeting. Theodore J. Crovello, President, Indiana Academy of Science.

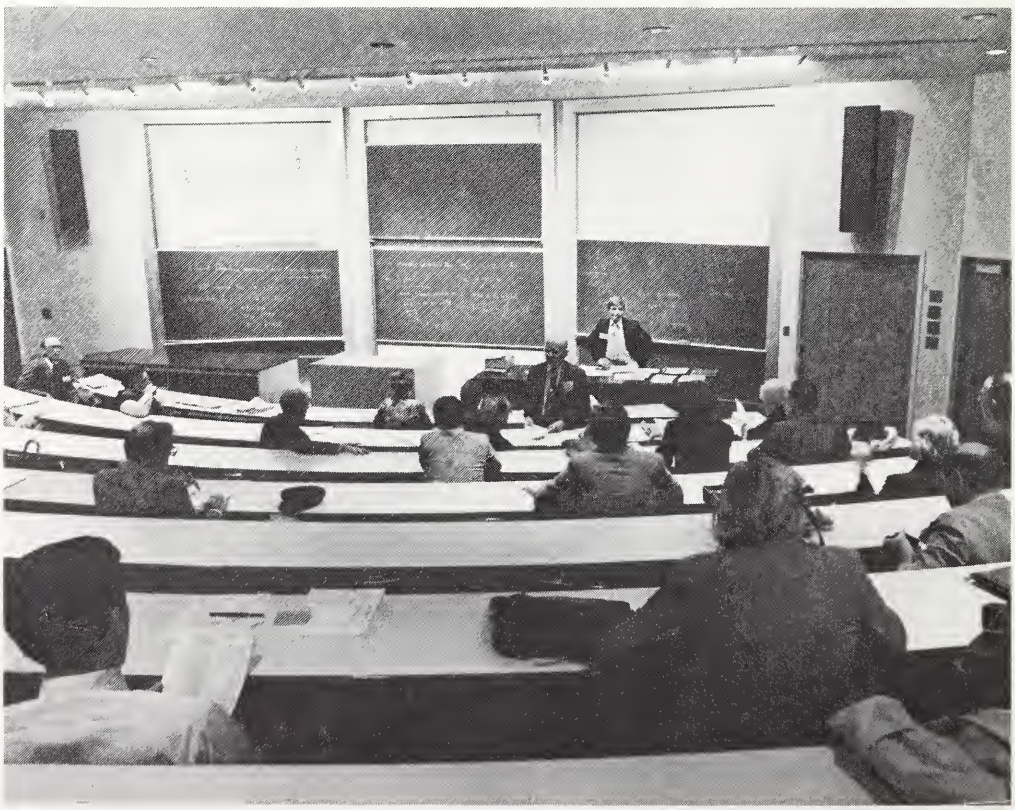


Centennial Address: *Past and Future Roles of Interdisciplinary Societies.* Philip H. Abelson, Editor, *Science.*

Dinner for Senior Academy Officers, Officers Elect, Committee and Section Chairs and their guests. Krannert Room, Clowes Hall.

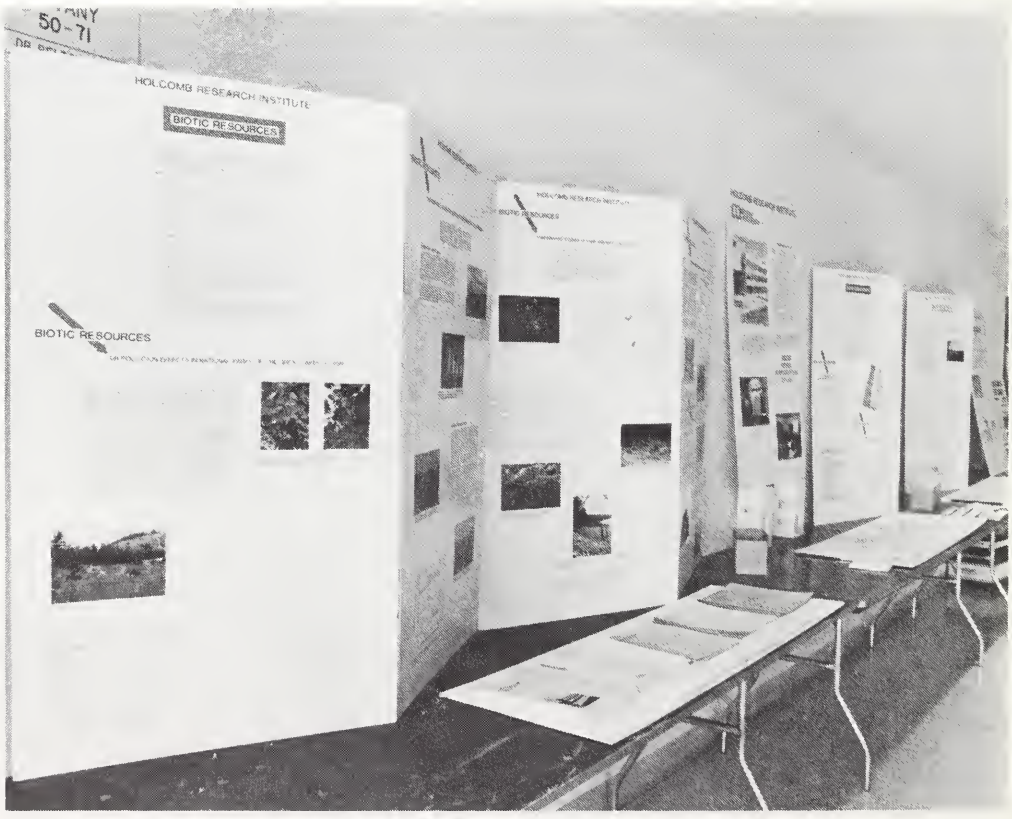


Executive Committee Meetings often generate problems.



Participants sometime provide solutions.

Gymnasiums provide space for informal luncheons.



Poster Sessions are becoming increasingly popular.

The Junior Academy sessions provide opportunities for student interactions.

SPECIAL ACKNOWLEDGMENT

Indianapolis, Indiana
November 2, 1984

During the Centennial Meeting, the Academy membership acknowledged those who have been members for 50, or more, years. The 1984 membership roster included the following 49 members who have an accumulated service to the Indiana Academy of Science of 2,653 years.

Name and Address	Section	Year Joined	Number of Years
Adams, William B. 703 Anita Street Bloomington, IN 47401	B	1919	65
Aldred, Jacob William H. R.R. 5, Box 8 Florence, AL 35630	C	1929	55
Baldwin, Ira 1806 Van Hise Hall University of Wisconsin Madison, WI 53706	CBR	1919	65
Bochstahler, Lester I. 422 Davis Street Evanston, IL 60201	CGP	1920	64
Brubaker, Ralph Box 141 Leesburg, IN 46538	SGE	1932	52
Campbell, Mildred F. 29 North Hawthorne Lane Indianapolis, IN 46219	AZB	1931	53
Caylor, Harold D. 303 South Main Street Bluffton, In 46714	ZCR	1931	53
Cooper, Robert H. R.R. 9, Box 298 Muncie, IN 47302	RBC	1934	50
Deray, M.H. George 715 Meridian Street West Lafayette, IN 47906	ACG	1929	55
Dunham, David H. 230 Connolly Street West Lafayette, IN 47906	RBZ	1920	64
Fidlar, Marion M. 1040 Vista View Drive Salt Lake City, UT 84108	CG	1931	53
Fulford, Margaret Department of Biological Sciences University of Cincinnati Cincinnati, OH 45221	B	1929	55

Name and Address	Section	Year Joined	Number of Years
GEISLER, FLORENCE E. 3717 North Riley Avenue Indianapolis, IN 46218	BG	1925	59
GETTLEFINGER, W.C. 9 Lincoln Road Indianapolis, IN 40223	BP	1928	56
GIRTON, RAYMOND E. 47 Cordone Drive San Anselmo, CA 94960	BOH	1928	56
GOULD, GEORGE E. 848 Kent Avenue West Lafayette, IN 47906	EZ	1934	50
GRAY, NINA E. Trust Department First National Bank of Normal Normal, IL 61761	BZ	1928	56
GUARD, ARTHUR T. 1845 Woodland Avenue West Lafayette, IN 47506	BTL	1929	55
HAAS, FLORA A. 1010 Lafayette Road Crawfordsville, IN 47933	BT	1914	70
HAZLETT, DONALD C. Russellville, IN 46175	G	1930	54
HEADLEE, W. HUGH 762 North Riley Avenue Indianapolis, IN 46201	BEZ	1926	58
HENNION, GEORGE F. 141 East Lasalle Avenue South Bend, IN 46617	C	1928	56
HOUGHAM, NAOMI M. 300 North Water Street Franklin, IN 46131	BZG	1922	62
JOHNSON, WILLIS H. Department of Biology Wabash College Crawfordsville, IN 47933	Z	1928	56
JORDAN, ESTHER K. 400 Circle Avenue Kerrville, TX 78028	ZY	1931	53
LANG, MAUD O. R.R. 2 Richland, IN 47634	RB	1933	51
LEMON, LOLA M. Box 113 Larwill, IN 46763	B	1929	55

Name and Address	Section	Year Joined	Number of Years
McCORMICK, ROBERT N. 211 Stradling Road Muncie, IN 47304	ZRC	1931	53
MATHIAS, HARRY R. 123 East Evers Avenue Bowling Green, OH 43402	M	1925	59
MELLON, MELVIN G. 338 Overlook Drive West Lafayette, IN 47906	C	1921	63
MICHAUD, HOWARD H. 301 East Stadium Avenue West Lafayette, IN 47906	BZH	1929	55
MINER, WILLIAM B. 710 Normal Road Dekalb, IL 60115	P	1928	56
MURRAY, MERRITT J. 2718 Oakland Drive Kalamazoo, MI 49008	BZT	1929	55
PAYNE, ELMER C. 440 River Road Chatham, NJ 07928	E	1933	51
PLASTERER, EIFFEL G. R.R. 5, Box 245 Huntington, IN 46750	PC	1929	55
RICHTER, ARTHUR 8872 Westfield Boulevard Indianapolis, IN 46240		1926	58
ROEHM, JOHN C. 102 Harold Drive Hot Springs, AR 71901	GY	1924	60
ROTHROCK, HENRY S. 3 Red Oak Road Wilmington, DE 19806	C	1926	58
SHOCK, NATHAN W. 6505 Maplewood Road Baltimore, MD 21212	OY	1927	57
SLUSSER, MACK W. 611 North Lebanon Street, Apt. 1 Lebanon, IN 46052	C	1930	54
SMITHBERGER, ANDREW T. 53085 Oakmont Park East Drive South Bend, IN 46637		1927	57
SPERRY, THEODORE M. 1413 South College Pittsburgh, KS 66762	BLT	1928	56

Name and Address	Section	Year Joined	Number of Years
Tallman, Arthur W. 207 Applecore Avenue Hendersonville, NC 28739	RC	1928	56
Thompson, Harold B. 8501 Wicklow Cincinnati, OH 45236	P	1934	50
Webb, Harold D. 812 West Delaware Street Urbana, IL 61801	P	1930	54
Welch, Winona H. 102 West Poplar Street Greencastle, IN 46135	BR	1924	60
Welcher, Frank 7340 Indian Lake Road Indianapolis, IN 46236	C	1934	50
Wickwire, Grant T. 43 Fenwood Grove Road Saybrook, CT 06475	G	1928	56
Willer, William Arnold 3890 Hartman Road Sodus, MI 49126	BZZ	1929	55
Witmer, Samuel W. 1325 Greencroft Drive, Apt. 385 Goshen, IN 46826	BZ	1921	63
Wolfe, Harold E. 2611 East Second Street, Apt. 16 Bloomington, IN 47401	M	1920	64

Indiana Academy of Science
FALL MEETING
OF THE EXECUTIVE COMMITTEE
November 1, 1984

MINUTES

President Theodore J. Crovello called the meeting to order at 3:30 p.m. in Gallahue Hall 108, Butler University, Indianapolis, Indiana.

TREASURER'S REPORT

Treasurer Duvall A. Jones reported the Academy finances as of October 31, 1984:

Current Assets

Checking Account	$ 7,822.96
Savings Accounts	$19,566.07
	$27,389.03

These are assigned to:

Academy Accounts	$13,229.80
Administered Accounts	$14,159.23
	$27,389.03

The total membership as of October 31, 1984, was 1,040.

It was moved, seconded, and voted that the Treasurer's report be accepted.

REPORTS OF ELECTED COMMITTEES

Academy Foundation Committee

William A. Daily, Chair, reported that on October 26, 1984, the Foundation Account had a market value of $42,424.53 and had earned $2,956.68 during the past year. The John S. Wright Fund had a market value of $678,504.03; its income was $37,580.08. The Invested Income Account, with assets of $125,143.65 had earned income of $8,853.11 and income transfer from the Wright Fund of $33,579.98.
The report was approved.

Bonding Committee

No report.

Research Grants Committee

Benjamin Moulton, reporting for Uwe Hansen, Chair, distributed a list of Academy Research Grants in the amount of $9,600 and High School Research Grants in the amount of $1,152. A list of the individual grants is appended to these minutes.

Report of Constitution Committee

The *ad hoc* committee on the revision of the Constitution and By-laws of the Academy, William Eberly, Chair, William Daily, and Clarence Dineen was represented by Dr. Eberly. He presented a four-page report listing suggested revisions. There was some discussion of the wisdom of discussing revisions without being able to see them in the context of the entire document. It was agreed that the changes would be discussed and that members should be able to see the entire revised document before being asked for final approval.

In the ensuing discussion several editorial changes were suggested which will be incorporated in the document to be presented to the membership. These minutes will report only those points where there was substantial discussion and/or issues were unresolved.

In Article 1, Section 3, the committee recommended empowering the Council, rather than the Executive Committee to act as an advisory body. There was some objection to this.

The committee recommends deleting *Member* from the list of membership categories. Consideration should be given to making it possible for Senior Members to indicate that they do not wish to receive the *Proceedings*.

The committee recommends that the sponsor of a science club be required to be a Senior Member of the Academy. It was suggested this might be an imposition because their commitment to Junior Academy activities precludes participation in Academy events.

By a show of hands, a majority of those present expressed preference for the word *chair* to replace *chairman* wherever it appears.

There was considerable discussion of Article V, Section 1, Part (1) concerning Trustees of the Academy Foundation. The resulting recommendation was that there be three elected members with rotating three-year terms, plus the Treasurer of the Academy as an ex-officio member without vote.

There was no discussion of Article V, Section 2, which describes the standing committees appointed annually.

Inclusion of the Science and Society chair on the Budget Committee by a revision of Article VI, Section 4, was questioned.

J. Dan Webster moved that the Executive Committee table the entire report of the Constitution Committee until the next meeting of the Executive Committee. The motion was seconded and carried.

REPORTS OF STANDING COMMITTEES

Speaker of the Year

Dr. Charles E. Heiser, Distinguished Professor of Botany, Indiana University, Bloomington, is Speaker of the Year.

Editor

Donald Winslow, Editor, reported that Volume 92 (1982) of the *Proceedings* was delivered from Western Newspaper Publishing Co., Inc. The issue was 825 hard bound and 525 paper copies, at a total cost of $15,332.49. The State of Indiana paid $8,400 and the Academy $6,932.49.

Copy for Volume 93 (1983) was in the hands of the printer on July 2, 1984. Section chairs are reminded of the December 1 deadline for copy, which has not been honored by several, resulting in the late submission to the printer. The volume is still in production and should appear early in 1985.

The Academy offered an honorarium for the best research papers in biological and physical sciences but the Editorial Board felt that none of the papers submitted for Volume 93 met the criteria.

The biennial budget request was submitted to the State Budget Agency in August. The request for Fiscal Year 1985-86 is $9,200; for 1986-87 it is $9,400. The 1984-85 appropriation is $8,900.

Committee on Emeritus Members

Dr. John Christian, School of Health Science, Purdue University, was granted Emeritus Membership.

Nominating Committee

J. Dan Webster, chair, reported the slate of officers who will be nominated for election at the General Meeting. His motion to nominate these people was approved.

Committee on Fellows

Wilton S. Melhorn, chair, presented the names of seven members to be placed in nomination at the General Meeting. They were approved for presentation to the membership at the General Meeting.

Youth Activities Committee

Susan M. Johnson, chair, presented the report.

The Committee has identified leading science teachers through a statewide search process. The two finalists and six semi-finalists will be recognized at the General Meeting.

A grant proposal to the AAAS for the support of research projects by secondary school students has been funded for $1200.

The committee proposes the establishment of a Science Olympiad, a series of contests by which middle and junior high school students would be encouraged to become interested in science-related activities.

Dr. Johnson moved that the Academy support the exploration of establishing an Indiana Science Olympiad. The motion carried.

Invitations Committee

Donald Cook, chair, reported that the 1985 host will be Indiana University at Bloomington, but that no invitations have been received for 1986 and beyond.

Junior Academy of Science

Cheryl Mason, Director, is studying the history of the Junior Academy and hopes to make its activities parallel those of the Academy. Suggestions can be sent to her at 216 Chemistry Building, Purdue.

Publications Committee

Benjamin Moulton, chair, reported that the inventory of past publications ranges from 1300 to 2000 copies for each of the past four monographs. Storage areas must be found.

Progress is continuing on three monographs.

400 copies of *The History of the Indiana Academy of Science* by William and Fay Kenoyer Dailey will be available for distribution after the General Meeting. The Academy owes a debt of gratitude to the Dailys for their completion of this five-year task.

A booklet summarizing the Symposium on Artificial Intelligence has been published and is being distributed at this meeting and about the state.

Library Committee

Distribution of the Academy *Proceedings*, Volume 92, has been completed by shipping 304 volumes to foreign exchange agencies. 176 volumes from the library's journals were bound commercially. 27 volumes and 23 microfiche have been added to the library collection, making the total number of volumes in the library 10,760.

The "Advice of Allotment" ($8900) has been received from the State Budget Agency to be applied to the cost of printing Volume 93 of the *Proceedings*. Budget requests for the next biennium have been delivered to the State Budget Agency: $9200 for 1985/86 and $9400 for 1986-87.

Mrs. Holly Oster of the Indiana State Library has been appointed to succeed Mrs. Lois Burton as librarian in charge of the Academy library.

Membership Committee

Duvall Jones pointed out that new brochures are necessary but membership categories are not clear pending revision of the Constitution.

Alice Bennett moved that the Executive Committee authorize publication of a brochure that does not include the "Member" category. The motion carried.

Representative to the Natural Resources Committee

Damian Schmelz circulated a report that said the Commission met in the field three times and at the State Museum. Agenda items pertain to oil and gas, water and floodways, forestry and wildlife, coal mining and reclamation.

Resolutions Committee

William Davies, chair, moved approval of a resolution he will present at the General Meeting, expressing appreciation to Butler University. Approval was granted.

Duvall Jones has suggested seven resolutions concerning education in Indiana. They were not discussed, but some modification of them may be presented by Jones on the floor of the General Meeting.

Science and Society Committee

Alice Bennett, chair, reminded members of the Saturday Symposium and called attention to a Darwin exhibit prepared by Gene Kritsky of the History of Science section.

NEW BUSINESS

Frank Guthrie moved that the initiation and reinstatement fee for members be set at zero dollars for 1985. The motion was seconded and carried.

Fay Kenoyer Daily, speaking on behalf of Lois Burton, presented Holly Oster, who is taking care of Academy affairs at the State Library. She has been voted by the State Library to succeed Mrs. Burton as our representative there. In order to cement this relationship and because of her devotion and excellent handling of our affairs and excellent qualifications, Fay Daily moved that Holly Oster be elected an Honorary Member of the Academy. The motion was seconded and carried.

Adjournment: 5:45 p.m.

Respectfully submitted
Richard L. Conklin, Secretary

Indiana Academy of Sciences
Fall 1984 Grant Application Funded

Research Grants Committee Actions

Principal Investigator —Institution	Title	Funded
C. M. Anslinger ISU	Thermoluminescent Determination of Chert Tools and Debitage from the Wint Site	$ 800
N. C. Behforouz Ball State U	The Role of Prostaglandin E_2 in the Immune Response to *Leishmania tropica*	$1,000
M. B. Berg/R. Hellenthal Notre Dame	The Role of Chironomids (Diptera: Chironomidae) in Stream Insect Productivity	$ 500
A. K. Berndtson/ R. Hellenthal Notre Dame	Plasma and Follicular Proteolytic Enzymes in the Ovulation of Brooktrout . . .	$ 650
D. DeManno/K. Tweedell Notre Dame	The Role of Adenylyl Cyclase in Brook Trout Oocyte Final Maturation	$ 750
B. B. Dusa/W. Brett ISU	Murine Natural Resistance to *Trypanosoma Lewisi*	$ 850
T. E. Klingler/D. Smith Purdue	Field Observations and Objective Analysis of Severe Weather in Indiana	$1,000
O. Kukal/J. Duman Notre Dame	Control of Cold Hardiness in Arctic Insects	$ 500
K. C. Kuo/T. West Purdue	Compression Strength Testing of the Springfield Coal, Pike County	$ 750
C. L. Mason/J. Kahle Purdue	Renovation and Updating the Biology Classroom	$1,000
J. Neven/J. Duman Notre Dame	Freeze Tolerance in Insects	$ 500
G. K. Podila/W. Brett ISU	In Vitro Translation and Gene Analysis of Double Stranded RNA Mycovirus	$ 600
C. M. Rogers/ V. Nolan, Jr. IU-Bloomington	Genetic and Environmental Components of Winter Fat Storage in the Dark-Eyed Junco	$ 700
	Total	$9,600

FALL 1984
Secondary School Research Grants

Name/Sponsor	Institution	Funded
Loretts Baker	East Noble	$ 150.00
(V. Rhodes)	Kendallville	
Sally Bloom	East Noble	100.00
(V. Rhodes)	Kendallville	
Eric Bonfield	Marquette	110.00
(D. Christakis)	Michigan City	
Julie Goldman	Gage Institute	175.00
(M. Goldberg)	Indianapolis	
John Hendricks	Marquette	100.00
(D. Christakis)	Michigan City	
Sima Medow	John Adams	57.00
N. Longenecker)	South Bend	
Michele Mengel	John Adams	70.00
(N. Longenecker)	South Bend	
Jerome W. Naylor	John Adams	70.00
(N. Longenecker)	South Bend	
Mark D. Owens	Marquette	50.00
(D. Christakis)	Michigan City	
Tammy Sibert	East Noble	170.00
(V. Rhodes)	Kendalville	
Ann R. Thorvik	Marquette	100.00
(D. Christakis)	Michigan City	
	Total:	$1,152.00

Indiana Academy of Science
Minutes of the General Meeting
November 2, 1984

The General Meeting of the Indiana Academy of Science was called to order by President Theodore J. Crovello at 1:20 p.m. on Friday, November 2, 1984, in Clowes Hall, Butler University, Indianapolis.

President Crovello opened this one-hundredth meeting of the Academy with reflections on the value of scientific disciplines working together as they have in Indiana since 1885 and moving forward together into the second hundred years.

President John G. Johnson of Butler University welcomed the Academy on behalf of the University. Dr. Crovello presented to him and the University a copy of the *History of the Indiana Academy of Science*.

Secretary Richard L. Conklin gave a summary of the Executive Committee meeting.

J. Dan Webster, Nominating Committee chair, moved the election of the following persons as officers and members of elected committees for 1985.

President: Benjamin Moulton
President-Elect: Ernest E. Campaigne
Treasurer: Duvall A. Jones
Director of Public Relations: Alfred Schmidt
Editor: Donald R. Winslow
Academy Foundation Committee member (2 year term): John A. Ricketts
Bonding Committee member (2 year term): Donald Hendricks
Research Grants Committee member: Austin Brooks

The motion was seconded and carried, and those named were declared to be elected.

Resolutions Committee Chair William Davies presented the following resolution:

WHEREAS: The Indiana Academy of Science is deeply grateful to Butler University for its invitation to hold our 100th annual meeting on their campus; and

WHEREAS: The administration, faculty, and students alike have cooperated in providing us their facilities for this Centennial Meeting; be it

RESOLVED: That the Academy members here assembled express their sincere appreciation to Dr. John G. Johnson, President of Butler University, for all the courtesies that have been extended to the Academy during this meeting. We are especially grateful to Dr. Philip St. John, his staff, and other participating members of the Butler University faculty, for the arrangements of the entire program and the comfort and conveniences provided the membership. We also express our sincere thanks to all members who organized and participated in all aspects of the Centennial Program.

The resolution was adopted unanimously.

Richard Conklin, member of the Committee on Fellows, moved that the following persons, whose nomination had been approved by the Executive Committee, be elected to the rank of Fellow:

Ernest M. Agee, Purdue University
Lois Burton, Indiana State Library
Thaddeus J. Godish, Ball State University
William R. Gommel, Indiana Central University
Henry H. Gray, Indiana Geological Survey
John H. Meiser, Ball State University
David M. Sever, St. Mary's College

The motion was seconded and carried. Congratulations and certificates of recognition were extended to those newly-elected Fellows who were present.

Holly Oster of the Indiana State Library, who was elected an Honorary Member of the Academy by the Executive Committee, was introduced. She acted on behalf of Lois Burton in accepting a plaque recognizing Mrs. Burton's years of service to the Academy as Director of the John S. Wright Library.

Recognition copies of the *History of the Indiana Academy of Science* were presented to its authors, Fay Kenoyer Daily and William Daily. Benjamin Moulton announced that copies would be distributed to members after the meeting.

Secretary Richard Conklin moved that the Indiana Academy of Science continue its affiliate relationship with the American Association for the Advancement of Science. The motion was seconded and carried.

Duvall Jones presented the following resolutions:

WHEREAS members of the Indiana Academy of Science are seriously concerned about having adequate numbers of well-qualified science teachers for the schools of Indiana

BE IT RESOLVED that the Indiana Academy of Science recommends that certification through a teaching minor in a science (or mathematics) be limited to those persons with a major concentration of courses in another natural science (or mathematics), and

WHEREAS science education at the elementary level is important to the development of attitudes toward science,

BE IT RESOLVED that the Indiana Academy of Science favors the increased requirements for science education in the elementary schools, and recommends support for science workshops and science consultants to assist elementary school teachers at the regional or local level.

After a brief discussion, the resolutions were approved by a majority of those present, as indicated by a show of hands.

Fay Kenoyer Daily, Necrologist, reported the deaths of the following Academy members who deaths had been recorded during the past year:

Bryon G. Bernard
Walter I. Brumbaugh
David H. Dunham
Elmer C. Payne
Edward W. Shrigley
Ruth Wimmer

Susan M. Johnson, Youth Activities Committee Chair, presented awards to the semifinalists and finalists in the 1984 Presidential Awards for Excellence in Science Teaching:

Semifinalists:

Gene P. Buzzard, Snider High School, Ft. Wayne
Ronald E. Divelbiss, Leo Junior/Senior High School
Gladysmae Good, Arlington High School, Indianapolis
Carole Goshorn, East High School, Columbus
Michael Kobe, Clay High School, South Bend
John J. Portle, North High School, Bloomington

Finalists:

Nevin Longenecker, John Adams High School, South Bend
Virginia Rhodes, East Noble High School, Kendalville

Mr. Longenecker spoke briefly about his reaction to the White House presentation of the Presidential Awards.

The Speaker of the Year, Dr. Charles B. Heiser, Jr., Distinguished Professor of Botany, Indiana University, Bloomington, gave an abbreviated version of the lecture he will be presenting in that capacity, "The Contributions of the Nightshade Family (*Solanaceae*) to Human Welfare."

The meeting adjourned at 2:40 p.m.

Respectfully submitted,
Richard L. Conklin, Secretary

Indiana Academy of Science

Budget Committee Meeting
December 1, 1984

Members Present: Alice Bennett, Richard Conklin, E. E. Campaigne, Walter Cory, William Daily, Frank Guthrie, Uwe Hansen, Duvall Jones, Susan Johnson, Cheryl Mason, Benjamin Moulton (President), Holly Oster, Donald Winslow.

Called to Order: 10:10 a.m., in Room 159A, Indiana State Library, Indianapolis.

President Moulton opened the meeting with a brief statement of his hope to work within the budget being set for 1985, guided by the findings of the Finance Committee which should be reported at the Spring Meeting. He plans to write letters to the past twenty presidents of the Academy asking their opinions on the role and operation of the Academy in its second century.

There was some discussion of financial decisions that must be made by the Publications Committee: Shall the price of the *Proceedings* be increased, given the fact that only $7.00 from dues are available to pay the $11.37 cost per copy. The *History* of the Academy cost about $5.50 per copy. It is being distributed free to members but a price needs to be set for copies sold to non-members. Guthrie suggested $7.50 for additional copies to members, $10.00 for non-members. Jones wondered if the *History* could be used as an incentive in the forthcoming membership campaign. Several combinations of years of membership and copies of the *History* with package rates were suggested. Other monographs might also be used.

Jones moved that publication cost of the brochure describing the Fall, 1984 Symposium on Artifical Intelligence be taken from the Income Trust Fund. The motion was seconded, and carried after some discussion about whether such publications could be more appropriately charged to Science and Society or Publications. The motion carried.

The Treasurer presented the proposed budget for 1985, which is attached herewith. After it had been discussed line by line, Hansen moved approval of the operating budget. The motion carried.

The following amounts were proposed for items paid from the Trust Fund:

Research grants	$23,200	
Research fellowships	3,000	
Publications	20,000	(Butterflies of Indiana)
	15,000	(Climate of Indiana)
	1,500	(Symposium Brochures)
	15,000	(History of the Academy)

Cory moved approval of the budget for Trust Fund and Administered Accounts. The motion carried.

The Bonding Committee will be instructed to discuss the necessity of bonding the Treasurer and the Trustees.

Bennett moved that the Academy designate Chase Manhattan Bank as a depository of Academy funds. The motion was seconded by Mason and approved.

Guthrie presented a suggested revision of membership categories and dues. It was discussed briefly but no action was taken.

Mason recommended that a liaison person from the host institution at the Fall meeting be appointed to work with the Junior Academy.

Winslow raised the question of late abstracts delaying publication of the *Proceedings*. He was encouraged to send a letter to persons presenting papers asking them to press their section chairs to submit the abstracts on time.

The meeting was adjourned at 12:30 p.m.

Respectfully submitted,

Richard L. Conklin
Secretary

Indiana Academy of Science
1985 Budget

Academy Accounts	Budgeted Income	Budgeted Expenses
Dues	9,250	
Reprints: Vol. 92 & 93	2,750	2,500
Interest	2,700	
Transfer from Administered Account		
Reserve funds for Centennial	2,000	
Meetings		
Program, Printing, and Mailing		
Registration Fees & Hospitality		
Meals	2,000	
President's Contingency Fund		250
Secretary		400
Treasurer		750
Editor's Expenses		400
General Office Expenses		450
Officer Travel		150
AAAS Representative		400
Biological Survey Committee		1,000
Centennial Committee		2,000
Finance Committee		250
Junior Academy of Science		1,000
Membership Committee		500
Newsletter		900
Public Relations		150
Program Committee		2,000
Speaker of the Year		700
Youth Activities Committee		1,250
Section Chairmen's Expenses		50
CPA Fees for Tax Returns		550
Miscellaneous		100
Transfers to Administered Accounts		
Library Binding		1,500
Proceedings; Mailing		700
Science and Society		750
TOTALS	$18,700	$18,700

Indiana Academy of Science
Financial Report
1 January—31 December 1984

I. ACADEMY ACCOUNTS

	Income	Budgeted	Expenditures	Budgeted
Dues	$ 9,192.00	$ 8,000.00		
Reprints: Vol. 92 & 93	1,773.20	3,250.00	$ 1,943.18	$ 2,850.00
Interest	2,859.75	2,000.00		
Transfer from Administered Accounts	434.58	434.58		
Reserve funds for Centennial		3,200.00		
President's Contingency Fund			21.76	1,000.00
Secretary			276.55	600.00
Treasurer			626.84	750.00
Editor's Expenses			262.06	700.00
General Office Expenses			210.21	250.00
Officer Travel			150.00	150.00
AAAS Representative			299.50	300.00
Biological Survey Committee			0.00	1,000.00
Centennial Committee			1,053.90	2,600.00
Finance Committee			0.00	450.00
Junior Academy of Science			998.49	1,000.00
Membership Committee			40.00	800.00
Newsletter/Public Relations			1,050.00	1,050.00
Program Printing & Mailing			1,554.24	2,000.00
Speaker of the Year			700.00	700.00
Youth Activities Committee			700.75	1,650.00
Section Chair's Expenses			50.00	50.00
CPA Fees for Tax Returns			500.00	500.00
Miscellaneous			0.00	100.00
Transfers to Administered Accounts				
Library Binding			1,500.00	1,500.00
Proceedings: Mailing			775.00	775.00
TOTALS for Academy Accounts	$14,259.53	$16,884.58	$12,712.48	$20,775.00
Administered Account (for budgetary purposes only)				
Meeting Fees and Hospitality	1,983.00	1,500.00	1,172.97	1,500.00
TOTALS for Budgetary Purposes	$16,242.53	$18,384.58	$13,885.45	$22,275.00

II. ADMINISTERED ACCOUNTS

	1 January Balance	1984 Transfers & Income*	1984 Transfers & Expenditures	31 December Balance
Junior Academy	434.58	$ 0.00	$ 434.58 (T_3)	0.00
J.S. Wright Library Fund	134.28	0.00	0.00	134.28
Lilly III Library Fund	2,619.76	0.00	0.00	2,619.76
Lilly V Library Fund	4,500.20	0.00	0.00	4,500.20
Library Binding	3,000.65	1,500.00 (T_1)	2,088.45	2,412.20
Proceedings: Printing	1,952.89	4,727.25 (T_2)	4,727.25**	1,952.89
Proceedings: Mailing	550.09	775.00 (T_1)	577.51	747.58
Publications: Printing &	3,435.35	901.26 (I)	14,235.90	4,282.61
Sale		14,181.90 (T_2)		
Research Fellowships	149.25	2,520.00 (T_2)	2,520.00	149.25
Research Grants & Awards	-5,210.76	20,435.00 (T_2)	20,660.70	-3,936.46
AAAS		1,200.00 (I)		
Life Membership		300.00(I)		
Science & Society	1,295.09	0.00	1,035.42	259.67
Science Talent Search	948.24	2,525.74 (I)	2,209.37	1,264.61
Meeting Fund	0.00	3,821.25 (I)	2,946.07	875.18
TOTALS	$13,809.62	$52,887.40	$51,435.25	$15,261.77

*I: Income from external sources.
T_1: Transfer from Academy Accounts.
T_2: Transfer from Academy Trust Funds
T_3: Transfer to Academy Accounts

** The State of Indiana paid an additional $8,400.00 toward printing of the *Proceedings*

III. SUMMARY

	Academy Accounts	Administered Accounts	TOTAL
Balance: 1 January 1984	$10,809.66	$13,809.62	$24,619.28
1984 Income	14,259.53	52,887.40	67,146.93
1984 Expenditures	12,712.48	51,435.25	64,147.73
Balance: 31 December 1984	12,356.71	15,261.77	27,618.48

IV. BANK BALANCES (as of 31 December 1984)

Super NOW Account	
Northwest National Bank, Rensselaer, IN	$4,810.68
Money Market Checking Account	
Chase Manhattan Bank, Acct #581-1-703239	9,063.58
Savings Accounts	
Farmers National Bank, Remington, IN-CD #2408862	2,000.00
#302641	2,000.00
State Bank of Rensselear, IN-CD #S 11766	9,744.22
TOTAL	$27,618.48

V. SUMMARY OF TRUST FUNDS

A. Foundation Account (0043-00-0)			
1. Income Account			
Income Cash Balance (1/1/84)		$ 0.00	
Dividends and interest for 1984		3,016.64	
Investments sold		500.00	
Disbursements for 1984			
Investments purchased	$ 2,000.00		
Research grants	300.00		
Transfer to principal cash	1,216.64		
	$ 3,516.64	$-3,516.64	
Income cash balance (12/31/84)		$ 0.00	$ 0.00
2. Principal Account			
Principal cash balance (1/1/84)		475.81	
Total receipts for 1984		6,200.00	
Transfer from Income Account		1,216.64	
Total disbursements for 1984			
Investments purchased	$ 7,700.00	-7,700.00	
Principal cash balance (12/31/84)		$ 192.45	$ 192.45
Market value of investments (12/31/84)			40,979.33
Total value of account (12/31/84)			41,171.78

*Carrying value of investments (12/31/84) is $34,828.68.

B. John S. Wright Fund (00430-01-9)			
1. Income Account			
Income cash balance (1/1/84)		$ 0.00	
Dividends and interest for 1984		38,751.07	
Disbursements for 1984			
Commission and fees	$ 4,000.10		
Transfer to 00430-02-8	33,113.63		
Investments purchased	$ 4,600.00		
	$ 41,713.73	$-41,713.73	
Income cash balance (12/31/84)		$- 2,962.66	$ -2,962.66
2. Principal Account			
Principal cash balance (1/1/84)		$ 2.19	
Total receipts for 1984		189,088.65	
Total disbursements for 1984		-189,085.89	
Principal cash balance		$ 4.95	$ 4.95
Market value of investments (12/31/84)			722,499.43
Total value of account (12/31/84)			$719,541.70

*Negative balance due to computer error; corrected 1/2/85.

**Carrying value of investments (12/31/84) is $367,882.23.

C. J.S. Wright Invested Income Account (00430-02-8)

1. Income Account		
Income cash balance (1/1/84)	$ 0.00	
Total interest for 1984	12,212.01	
Investments sold	11,500.00	
Disbursements for 1984		
Investments purchased	-11,100.00	
Distributions (grants)	-2,520.00	
Transfer to Principal account	-6,877.34	
Income cash balance (12/31/84)	$ 3,214.67	$ 3,214.67
2. Principal Account		
Principal cash balance (1/1/84)	$ 5,475.21	
Funds transferred from Account 00430-01-9	33,113.63	
Investments sold	108,200.00	
Disbursements for 1984		
Investments purchased	-109,319.16	
Distributions (Grants and *Proceedings*)	-39,044.15	
Transfer from Income account	6,877.34	
Principal cash balance (12/31/84)	$ 5,302.87	$ 5,302.87
Carrying value of investments (Income account) (12/31/84)		4,100.00
Carrying value of investments (Principal account) (12/31/84)		101,404.39
Total value of account (12/31/84)		$114,021.93

D. Total Assets of Trust Accounts (12/31/84)

	Income Cash	Principal Cash	Market Value of Investments	Total
Account 00430-00-0	$ 0.00	$ 192.45	$ 40,979.33	$ 41,171.78
Account 00430-01-9	-2,962.66	4.95	722,499.43	719,541.72
Account 00430-02-8	3,214.67	5,302.87	105,504.39*	114,021.93
Totals (12/31/84)	$ 252.01	$ 5,500.27	$868,983.15	$874,735.43

*Carrying value of investments

VI. NOTES

Membership as of 31 January 1985: The Treasurer's records show that the Academy has 1112 paid memberships for 1984: 51 sustaining, 2 sustaining family, 508 senior, 33 senior family, 255 regular, 13 regular family, 110 student, 106 emeritus, 3 honorary, 4 life, and 27 club memberships.

6 members deceased (included in totals above)
101 members on file from 1983, but not paid for 1984.
143 new members for 1984 (included in totals above).
13 previous members reinstated in 1984 (included in totals above).
7 persons resigned.
105 individuals dropped for nonpayment of 1983 dues.

Dues structure for 1984:

$ 2.00	for student memberships
5.00	for memberships and club memberships
10.00	for senior memberships
25.00	for sustaining memberships
2.00	additional for family memberships
300.00	for life memberships
150.00-500.00	corporate memberships
50.00-100.00	institutional memberships

Reprints: All authors of papers in Volume 92 of the *Proceedings* have paid for the reprints which they ordered. Cost of the reprints to the Academy was $1,943.18. Authors paid the Academy $2,044.25 for reprints.

Publications: Sales of reprints, monographs and *Proceedings* in 1984 totaled $2,618.46.

Research Grants: Funds totaling $21,087.00 have been awarded to: M. Binkley (Indiana State), H-W Chang (Indiana U.), S. Cortwright (Indiana U.), S.W. Dhawale (Indiana U.), R. Faflak (Indiana State U.), H. Feldman (Indiana U.), S.R. Ferson (State U of NY), B. Fuchs (Indiana State U.), J. Hengeveld (Indiana U.), M.A. Hughes (Indiana U.), R. Joyner (Ball State), C. Kirkner (Notre Dame), J.M. Kwolek (Indiana U.), R. Lyng (IUPU—Ft. Wayne), M. Mandracchia (Notre Dame), R. Pinger (Ball State), S. Ropski (ISU Life Sc.), A. Roux (Notre Dame), C. Tomak (IN Dept. Highw.), Vierma & Feldman (Indiana U.), R. Walton (Indiana U.), Wm. Wilson (Indiana State U.), L. Wolf (Indiana U.), C.M. Anslinger (Indiana State U.), N.C. Behforouz (Ball State U.), M.B. Berg/R. Hellenthal (Notre Dame), A.K. Berndtson (Notre Dame), D. DeManno (Notre Dame), B.B. Dusai (Indiana State U.), T.E. Klinger (Purdue), O. Kukal (Notre Dame), K.D. Kuo (Purdue), C.L. Mason (Purdue), L. Neven (Notre Dame),

G.K. Podila (Indiana State U.), C.M. Rogers (Indiana U.), L. Baker (East Noble H.S.), T. Barker (East Noble H.S.), S. Bloom (East Noble H.S.), E. Bonfield (Marquette H.S.), J. Goldman (Gage Institute), J. Hendricks (Marquette H.S.), S. Medow (John Adams), M. Mengel (John Adams), J. Naylor (John Adams), M.D. Owens (Marquette H.S.), T. Sibert (East Noble H.S.), A.R. Thorvik (Marquette H.S.).

Grants Received: Kappa Kappa Kappa Sorority made $2,500 available for awards and expenses for the Science Talent Search for Indiana high school students.

The American Association for the Advancement of Science granted $1,200 to be used by high school students for research.

VII. BUDGET FOR 1985

The following budget was approved by the Budget Committee in the meeting of 1 December 1984.

Anticipated Income			
Academy Accounts			
Dues		$ 9,250.00	
Interest		2,700.00	
Reprint Charges to Authors: Vol. 93 & 94		2,750.00	
Centennial expenses (from reserves)		2,000.00	
Administered Accounts			
Meeting Fees		2,000.00	
	Total	$ 18,700.00	$ 18,700.00
Budgeted Expenditures			
Academy Accounts			
Reprints		$ 2,500.00	
President's Contingency		250.00	
Secretary		400.00	
Treasurer		750.00	
Editor's Expenses		400.00	
General Office Expenses		450.00	
Officer Travel		150.00	
AAAS Representative		400.00	
Biological Survey Committee		1,000.00	
Centennial Committee		2,000.00	
Finance Committee		250.00	
Junior Academy of Science		1,000.00	
Membership Committee		500.00	
Newsletter/Public Relations		1,050.00	
Program Printing & Mailing		2,000.00	
Speaker of the Year		700.00	
Youth Activities Committee		1,250.00	
Section Chairmen's Expenses		50.00	
CPA Fees for Tax Returns		550.00	
Miscellaneous		100.00	
Transfers to Administered Accounts			
Library Binding		1,500.00	
Proceedings: Mailing		700.00	
Science and Society		750.00	
Total for Academy Account		$ 18,700.00	
Administered Account			
Meeting expenses		$ 1,500.00	
	Total	$ 20,200.00	$ 20,200.00
Budgetary Deficit			$ -1,500.00
Trust Funds			
Anticipated Income and Expendable Funds			
IAS Foundation (00430-00-0)		$ 2,500.00	
J. S. Wright Fund (00430-01-9)		35,000.00	
Invested Income Account (00430-02-8)		114,000.00	
TOTAL		$151,500.00	

Approved Expenditures	
Fiduciary Fees	4,000.00
Research Grants for Senior Academy Members	22,500.00
Research Fellowships for Secondary School Teachers	3,000.00
Publications	
Proceedings—Volume 93	5,000.00
Climate of Indiana	15,000.00
Butterflies of Indiana	20,000.00
Symposium booklet (Science and Society)	1,500.00
Brochure on research grants	700.00
Awards for outstanding research papers	300.00
TOTAL	$ 72,000.00

****

Restricted Accounts (accounted for elsewhere)	
Anticipated Income	
AAAS Funds for High School Student Research Grants	$ 1,200.00
Tri-Kappa funds for Science Talent Search	2,500.00
Meeting fees	2,000.00
Sale of Publications	1,000.00
Income from Foundation Account	300.00
TOTAL	7,000.00
Anticipated Expenditures	
Research Grants Committee—Junior Academy Grants	$ 1,200.00
Science Talent Search	2,500.00
Meeting expenses (Hospitality)	1,500.00
Publications	300.00
Awards for outstanding research papers (Funds from Foundation Account)	300.00
TOTAL	$ 5,800.00

Respectfully submitted,
Duvall A. Jones, Treasurer

We, the undersigned, have audited the Treasurer's records for the Indiana Academy of Science for the year of 1984 and have found them to be accurate and in order.

Andrew G. Mehall

_____, 1985

John Ricketts

_____, 1985

INDIANA JUNIOR ACADEMY OF SCIENCE

Senior Division Presentation Schedule

November 2, 1984 — Butler University

Life Science

9:30	Student:	Tim Burgess
	School:	Center Grove High School (Greenwood)
	Title:	"An Examination of the Phytotoxic Effects of Sulfur and Nitrogen Dioxides on Jack Pine Trees (Pinus banksiana) and Alfalfa (Medicago sativa)"
9:45	Student:	Richard Berry
	School:	Donald E. Gavit High School (Hammond)
	Title:	"Determining the Concentration at which 2,4,5 Trichlorophenoxyacetic Acid Changes from an Herbicide to a Plant Growth Stimulant on Hydroponically Grown *Pisum sativum*"
10:00	Student:	Sally Bloom
	School:	East Noble High School (Kendallville)
	Title:	"A Study of Histoplasma Culture and Treatment in Vitro"
10:15	Student:	Ted Couillard
	School:	Highland High School (Highland)
	Title:	"Cortical Bone Thickness in Chirikiv Island Eskimos"
10:30	Student:	Scott Seay
	School:	Center Grove High School (Greenwood)
	Title:	"The Importance of Vitamin A"
10:45	Student:	Loretta Baker
	School:	East Noble High School (Kendallville)
	Title:	"Studies on Gossypol: II. Antifertility Effects in Nutritionally Deprived Male Hamsters, *Mesocricetus auratus*
11:00	Student:	Tonette Atkins
	School:	Paoli Junior-Senior High School (Paoli)
	Title:	"Synergism Identification of Antibiotic Combinations Phase II: Toxicity Determination Utilizing Tissue Culture Techniques"
11:15	Student:	Valerie Lamos
	School:	Canterbury High School (Fort Wayne)
	Title:	"Wholeist Versus Serialist Learners: A Classroom Applicable Diagnostic Tool for Learning Preference with Variables of Lobe Dominance, Scanning Approach and Age"
	Alternate Student	Robert Beglin
	School:	Marquette High School (Michigan City)
	Title:	"Electrical Cell Hybridization and the Discovery of a New Cell Line"

Physical Science

9:30	Student:	Peter Hershberger
	School:	Canterbury High School (Fort Wayne)
	Title:	"Computers in the Workplace: Radiation Dosage in Millirads among Personnel Involved in Office Cathode Ray Tube Work as a Function of CRT Year of Manufacture"
9:45	Student:	Anne Tseng
	School:	Highland High School (Highland)
	Title:	"Manipulation of DNA with Restriction Enzymes"

10:00	Student:	Gene DeFelice
	School:	Donald E. Gavit High School (Hammond)
	Title:	"An Inexpensive Method for Drawing Space-Fill Molecules"
10:15	Student:	Annie Carson
	School:	Bishop Chatard High School (Indianapolis)
	Title:	"Extraction, Separation, and Purification of Anthocyanins for Use as a Natural Food Colorant"
10:30	Student:	Mark Owens
	School:	Marquette High School (Michigan City)
	Title:	"Holographic Interferometry: Determination of Pressure Mediated Nanometric Deformation as Applied to Reinforced Plastic Configurations"

Junior Division Presentation Schedule

November 2, 1984 Butler University

Biological Science

9:35	Student:	Jennifer Dawes
	School:	Canterbury Middle School (Ft. Wayne)
	Title:	"A Microphotographic Investigation of Chloroplastid Concentration and Chlorophyll Density as a Function of Water Turbidity of Selected Area Rivers and Streams"
9:47	Student:	Janette DeFelice
	School:	Donald E. Gavit Middle School (Hammond)
	Title:	"The Effects of Pharmaceutical Vitamins on the Green Bean Plant"
10:11	Student:	Laura Mannion
	School:	Donald E. Gavit Middle School (Hammond)
	Title:	"The Effects of an Acid Rain-Like Solution on Ivy and Petunia Plants"
10:35	Student:	Brett Bologna
	School:	Marquette HS, (Michigan City)
	Title:	"The Etiology of Cancer: Bacterial Assaying for the Potential Carcinogenicity of Nicotine and Chewing Tobacco"
10:47	Student:	Chris Bardol
	School:	Marquette HS, (Michigan City)
	Title:	"The Preventative Effect of Vitamin E on Crown Gall Tumors in *Helianthus annus*"

Physical Science

9:59	Student:	Mark Skoog
	School:	Highland High School (Highland)
	Title:	"Kirlian Photography"
10:23	Student:	Meghan Cast
	School:	The Canterbury School, (Ft. Wayne)
	Title:	"Precipating Sulfides: A Comparison of Three Metals as Sulfide Salts in Relation to Physical Differences in Structure"

Senior Division Paper Presentation Winners

Biological

Place	Name	Grade	School
1st	Loretta Baker	12	East Noble HS

2nd	Tonette Atkins	12	Paoli HS
3rd	Rich Berry	12	Gavit HS
	Physical		
1st	Anne Tseng	12	Highland HS
2nd	Gene DeFelice	11	Gavit HS
3rd	Mark Owens	12	Marquette HS

Junior Division Paper Presentation Winners

	Biological		
1st	Chris Bardol	9	Marquette HS
2nd	Brett Bologna	9	Marquette HS
3rd	Jennifer Dawes	8	Canterbury MS

Outstanding Jr. Scientist Nominees

Nominee	School	City
Mark Owen	Marquette HS	Michigan City
Anne Tseng	Highland HS	Highland
Chris Moses	Canterbury HS	Ft. Wayne
Annie Carson	Bishop Chattard HS	Indianapolis
Loretta Baker	East Noble HS	Kendalville
Richard Berry	Gavit HS	Hammond
John Satanele	E. C. Roosevelt	East Chicago

Outstanding Jr. Scientist Award

	Name	Grade	School
Winner	Mark Owen	11	Marquette HS
Alternate	Anne Tseng	12	Highland HS

A.A.A.S. Winners

	Name	Grade	School
Top Female	Anne Tseng	12	Highland HS
Top Male	Mark Owen	11	Marquette HS

Senior Division Polemic Winners

Name	Grade	School
	1st Place	
Tim Burgess	11	Center Grove HS
Rich Prall	11	(B Team)
Lorie Knobel	11	
Doug Peters	11	
	2nd Place	
Lisa Parsons	12	Marquette HS
Colby Parsons	10	(B Team)
Eric Todd	10	
Ann Thorvik	10	

	3rd Place	
Charlie Wolven	11	Highland HS
Lynda Chick	10	(B Team)
Alan Adad	12	
Ted Couillard	12	

Junior Division Polemic Winners

Jenny Dawes	8	Canterbury MS
Anne Hayhurst	8	(A Team)
Katie Posther	8	
Brad Keoun	8	
	2nd Place	
Pat Abram	9	Marquette HS
Charles Welborne	9	(A Team)
Heidi Bonfield	9	
Gina Palmer	9	
	3rd Place	
Chris Sessions	8	Canterbury MS
Selena Hariharan	8	(B Team)
Chris Cranz	8	
Elisa Spindler	8	

Aerodynamic Contest

Senior Division

Place	Name	Distance
1st	David Caseldine	62.0 ft
2nd	Sean Eviston	55.0 ft
3rd	Luke Adams	47.2 ft
	Junior Division	
1st	John Puke	35.0 ft
2nd	Nanelle Digdigan	33.2 ft
3rd	Mark Skoog	32.8 ft

Minutes of the
Indiana Junior Academy of Science
52nd Annual Planning Meeting

On August 23, 1984, there was an Indiana Junior Academy meeting held for council members, officers, and club representatives. The meeting was held at Purdue University in West Lafayette, Indiana. The purpose of the meeting was to plan the fall meeting and to take under consideration constitution revisions suggested by the Gavit Science Club. It was decided at this meeting that each club would have one delegate for voting purposes at the annual fall meeting. This would eliminate a lot of the confusion that has existed in the past during vote tabulation.

Two days later on August 25, 1984, a meeting was held at Mr. Kobe's home in Munster, Indiana. The club delegates in attendance at this meeting made revisions to the constitution and submitted these revisions for club approval at the annual fall meeting.

Respectively submitted
Kimberly M. Canady
Indiana Junior Academy Secretary

On November 2nd 1984 the Indiana Junior Academy of Science held its 52nd annual meeting at Butler University in Indianapolis, Ind. The meeting was opened by President Petra Fuerhaupter.

Thom Barker, our I.J.A.S. representative to the A.J.A.S., gave a report of the A.J.A.S. meeting that he attended during the summer in New York City, NY.

The Senior Academy recognized Jr. Academy Director Cheryl Mason and Council Members Michael Kobe and Virginia Rhodes for their contributions toward the Indiana Junior Academy of Science.

Keith Hunnings, director of the I.J.A.S. for ten years, was presented a plaque for his outstanding efforts as past director.

Dr. James Paul George of De Pauw University distributed chemistry lab papers to those who were interested.

The constitution changes proposed by the Gavit HS Science club, and the subsequent alteration re-written by committee were unanimously approved by the membership.

Respectively submitted
Kimberly Canady
I.J.A.S. Secretary