1991


Academy Editors

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MINUTES OF THE SEVENTY-FOURTH MEETING - APRIL 1991

FIRST BUSINESS MEETING

The meeting was called to order at 11:43 by President Watson.

1. Watson called for a representative of the Local Arrangements Committee or UAF to welcome the Academy; no response.

2. Watson recognized the Historian, H.W. Robison for a statement. This is the 75th Meeting of the Academy, the 12th time in Fayetteville. Observe the display of Academy history; Robison plans to set up this display at each annual meeting and still would like to have pictures and historical sketches.

3. Watson recognized the Secretary for the distribution of the minutes of last year’s meetings and opportunity for questions and corrections. Any corrections should be submitted to me Secretary in written form before the second business meeting. Secretary also requested any motions, announcements and resolutions to be submitted in written form.

4. Watson recognized the Treasurer, Robert Wiley, for distribution and explanation of the financial report. No questions or comments came forth. Watson appointed an Auditing Committee, Stan Trauth (ASU), David Saugey (USFS), and Maurice Kleve (UALR), who will examine Wiley’s books and report at the second business meeting.

ARKANSAS ACADEMY OF SCIENCE
ANNUAL FINANCIAL STATEMENT
(20 MARCH 1990 TO 20 MARCH 1991)

UNIVERSITY OF ARKANSAS, FAYETTEVILLE, AR

FUNDS

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance Approved by Audit on 7 April 1990</td>
<td>16,863.31</td>
</tr>
<tr>
<td>Total Income (Page 2)</td>
<td>13,970.40</td>
</tr>
<tr>
<td>Total Expenses (Page 3)</td>
<td>9,715.68</td>
</tr>
<tr>
<td>Balance for the Year</td>
<td>4,254.72</td>
</tr>
<tr>
<td>TOTAL FUNDS AS OF 20 MARCH 1991</td>
<td>21,118.03</td>
</tr>
</tbody>
</table>

DISTRIBUTION OF ACCOUNTS

<table>
<thead>
<tr>
<th>Account</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest Bearing Checking Account (Union Bank and Trust Co, Monticello, AR)</td>
<td>2,797.36</td>
</tr>
<tr>
<td>Dwight Moore Endowment (Heritage Federal Savings and Loan - Monticello)</td>
<td>1,730.68</td>
</tr>
</tbody>
</table>

Page 2.

INCOME: 20 March 1990 to 20 March 1991

1. INDIVIDUAL MEMBERSHIPS
   a. Regular                                                               2,700.00
   b. Sustaining                                                            240.00
   c. Sponsoring                                                           90.00
   d. Life                                                                  660.00
   e. Associate                                                             40.00
   Total                                                                  3,620.00

2. INSTITUTIONAL MEMBERSHIPS
   Total                                                                  2,100.00

3. PROCEEDINGS, LIBRARY SUBSCRIPTIONS                                     453.00

4. PROCEEDINGS, MISC. SALES (UAF)                                          2,174.46

5. PROCEEDINGS, PAGE CHARGES                                               2,750.00

6. ANNUAL MEETING: ARKANSAS STATE UNIVERSITY - 6-7 APRIL 1990             1,640.25

7. INTEREST
   a. Interest Bearing Checking Account                                     99.35
   b. Dwight Moore Endowment                                                116.78
   c. Life Membership Endowment                                             606.24
   d. AAS Endowment                                                         73.68
   Total                                                                  883.12

8. ENDOWMENT DONATIONS
   a. Dwight Moore Endowment                                                125.00
   b. AAS Endowment - Unrestricted                                          225.00
   Total                                                                  350.00

9. MISCELLANEOUS                                                           124.57

TOTAL INCOME                                                             8,144.90
Arkansas Academy of Science

Page 3. Financial Statement, Arkansas Academy of Science

EXPENSES: 20 March 1990 to 20 March 1991

1. AWARDS
   a. Theresa Hines (#556) $50.00
   b. D. Alcala (#557) $50.00
   c. John D. Peck, Plaque - Arkansas Science Talent Search (#568) $125.00
   d. Arkansas Junior Academy of Science (#568) $250.00
   e. Arkansas Science Fair Association (#566) $200.00

2. PROCEEDINGS
   a. Phillips Litho (Vol. 43) (#551) 107.90
   b. Phillips Litho (Vol. 43) (#509) 8,057.24
   c. Linda Lee, Editorial Consultant Vol. 43 (#552) 505.00

3. OFFICE EXPENSES
   a. Secretary's Office $468.78
   b. Treasurer's Office $25.00
   c. Postmaster (#560) 273.76

4. ANNUAL MEETING EXPENSES (ASU)
   a. Mr. Trophy (#563) $42.24

5. NEWSLETTERS
   a. University of Arkansas, Forest Research (#565) $63.36

6. SUBS
   a. National Association of Academies of Science (#564) $20.00

7. SERVICE CHARGE
   $11.90

8. MISCELLANEOUS (#562)
   $16.67

TOTAL EXPENSES $9,715.68

5. Watson recognized the Proceedings Editor, Harvey Barton, for a report. Individuals pick their copy of the journal and would represent each campus return with unclaimed copies sent to that campus. Editors should gather manuscripts at the conclusion of paper sessions. Motion: (Barton; 2nd A. Johnson) the Academy appropriate $500 for editorial assistance to prepare volume 45 (1991) of the Proceedings.

6. Watson recognized the Newsletter Editor, Dick Kluender, for a report. The cost to the Academy was postage ($63.35); the Department of Forest Resources (UAM) supports the printing. Thanks R. Wiley for proofreading and J. Rickett for providing mailing labels. Motion: (Kluender; 2nd D. Saugey) the Academy appropriate $650 to support production of the Newsletter in case the next editor cannot find in-house support to this extent.

7. Watson recognized the Director of Science Fairs, Mike Rapp, for a report.
   a. Science Fairs: reported on the participation by students and teachers in seven regional fairs and the International Science Fair. Motion: (Rapp; 2nd A. Johnson) the Academy appropriate $320 to support the Arkansas Science Fair Association. Rapp also moved the Academy officially commend the seven regional science fair directors (2nd H. Barton) (letter attached).
   b. Junior Academy of Science (for Pat Knighten): Motion: (Rapp; 2nd H. Barton) the Academy appropriate $250 to provide scholarship awards to winners at the Junior Academy of Science Meeting late this month.

8. Watson recognized the Director of the Junior Science and Humanities Symposium, Tom Falco, for a report. The meeting was held 15-17 March, and 114 students and 35 teachers submitted 73 papers, 15 of which were selected to be presented orally. The highlights of the meeting was a four-hour barge trip on the Arkansas River sponsored by the U.S. Corps of Engineers. Last year's national competition was won by an Arkansas, Jesse Sang, Little Rock Central High School, who received a two-week trip to London, England. This year's Arkansas representative to the national competition will be Edith Apple from North Little Rock with the paper, "Hierarchy of Navigation in Red Ants."

9. Watson gave a report from the Nominating Committee; George Harp was submitted as nominee for Vice-President. Opportunity was provided for nominations from the floor, but none came.

10. Watson relayed the report from Leo Paulissen of the Biota Survey Committee. New addenda are being prepared, but none are available at this time.

11. Watson gave a report on the new composition of the Science Education Committee -- 12 members, three year terms, four members rotate off each year. There will be a meeting this afternoon after the paper sessions. New members are Tom Lynch, Chair; Bonnie Moody (Henderson State University); Rudy Timmeman (Rich Mountain Community College); and Dalena Tull (University of Central Arkansas). Watson asked Luch to read the list of the other members.

12. Motion: (Rickett; 2nd T. Falco) the Executive Committee at the Fall 1990 meeting approved the raising of "Associate" membership dues from $5 to $10. But the category name should be also be labelled as undergraduate. This will be voted on during the second business meeting.

13. Watson appointed a Resolutions Committee consisting of Robert Wright, Mike Pammen and John Sorensen.

14. Watson announced the acceptance by the Executive Committee of the invitation from the University of Central Arkansas to host the 1992 meeting. We have not received an invitation for the 1993 meeting.

15. Watson encouraged the section chairpersons to keep their paper presentations on time.

16. Watson announced that the Arkansas Science Teachers Association is meeting in conjunction with the Academy. We welcome them and hope their efforts are productive.

17. Watson, in lieu of a representative of the Local Arrangements Committee, announced the banquet. Dr. Terry Cole (NASA) will
Secretary's Report

Speak after dinner. Sigma Xi is sponsoring the banquet speaker. Everyone is invited to the social hour prior to the banquet.

18. Watson reported on the background and mechanics of the "logo contest." No interest shown yet, but it is still open. Wiley knows a graphic designer who might help us design a new logo. Watson also brought some samples of logos from other states.

19. Watson called for new business and hearing none, adjourned the meeting at 12:20.

SECOND BUSINESS MEETING

President Watson called the meeting to order at 12:10 pm.

1. Watson called for corrections to and approval of minutes from last year's business meetings. No corrections were offered, and approval was by voice vote.

2. Watson recognized Stan Trauth for a report from the Auditing Committee. The committee found the Treasurer's books in order and moved the approval of the Treasurer's report for the year immediately past. Motion carried by voice vote.

3. Watson recognized Treasurer, Robert Wiley for a follow-up on his report in the first business meeting. No further questions came, and Wiley summarized by stating the Academy's financial status as secure as it has been in recent years. Report approved by voice vote.

4. Watson recognized Secretary, John Rickett for a re-statement of the five motions for continued support:
   a. H. Barton, editorial assistance: $500
   b. D. Klaender, Newsletter: up to $650
   c. M. Rapp, Science Fairs: $320
   d. M. Rapp (for P. Knighten), Junior Academy: $250
   e. M. Rapp (for John Peck), Westinghouse Talent Search: $150

Motions approved as a group by voice vote.

5. Watson recognized the Secretary for a re-statement of the motion to raise "Associate" (Undergraduate) Membership category dues from $5 to $10. Motion passed by voice vote.

6. Watson recognized the Nominating Committee's submission of George Harp for Vice-President and opened the floor for further nominations. R. Spears moved G. Harp be elected by acclamation (2nd H. Barton). Motion carried by voice vote.

7. Watson recognized R. Wright for a report from the Resolutions Committee, who then read the following resolutions:

   Be it resolved that: the members of the Arkansas Academy of Science recognize Dr. Robbin Anderson for his dedicated service as chair of the Science Education Committee. His constant alertness to legislative issues, government programs and regulations regarding science education has served us well. If he occasionally told us more than we wanted to hear, we probably needed to know it. Ever the gentleman, he has been our distinguished ambassador for science education. We thank him for his service.

   Be it resolved that: the members of the Arkansas Academy of Science recognize Dr. Paul Krause for his work as Director of the Junior Academy of Science. Organizing and carrying out the annual meeting is a little like being the local arrangements chair for the Academy of Science year after year. And he has done a thoroughly professional job. His contribution toward encouraging and honoring high school students and teachers has made a difference in Arkansas, and we thank him.

8. Watson announced the University of Central Arkansas will host the 1992 Academy of Science. Decision was made at the fall 1991 meeting of the Executive Committee.

9. Watson recognized the Nominating Committee; Jim Daly (UAMS), Dan England (SAU), and Walt Godwin (UAM) and thanked them for their work.

10. Watson announced no invitation has been received yet for the Academy's 1993 meeting. We usually try to plan two years in advance. He solicited an invitation.

11. Watson recognized Leo Paulissen for a follow-up report on the Biota Survey. He is currently preparing a few new lists but doesn't have any ready at the present.

12. Watson called for New Business:

   a. Announced (for H. Barton) for campus representatives to pick up unclaimed copies of the Proceedings and take them back with you. M. Rapp assisted in the disbursing these groups of journal copies.

   b. Watson asked if the paper judges had made their final decision yet - no.

   c. A comment from the floor pointed out that two different times publicized for the first business meeting caused some participants to miss it. President: point well taken.

   d. A comment from the floor drew attention to an error in the journal's instructions to authors page.

   e. Watson again recognized the Historian's efforts in assembling the historical display. He also reminded the membership to submit items of interest to H. Robison.

   f. Watson again recognized the Audit Committee, Resolutions Committee, Science Education Committee, and the Judging Committee (Ed Dale, Nancy McCartney, John Dixon and Jeff Demarlos). Watson personally thanked the members of the Executive Committee for their contributions during the past year and particularly Mike Rapp and John Rickett.

   g. Watson recognized Mike Rapp and installed him as the new President. Rapp then presented Watson a plaque of recognition for last year's work as President. Rapp brought attention to a picture of a horsefly embossed on the plaque as representative of Watson's research interests, whereupon Watson replied with a statement about the horsefly's blood-sucking tendencies. A little levity doth lighten the spirit.
Arkansas Academy of Science

13. M. Rapp, as new President, asked new members to rise and introduce themselves as evidence that the Academy of Science is a family. He also asked life members to rise and introduce themselves. He urged action by those who are willing to facilitate the work of the Academy and continue our tradition of excellence.

14. Betty Speairs asked Rapp to introduce our President-Elect, which he did — Art Johnson.

15. Rapp recognized John Sorensen who issued an appeal for Academy members to volunteer to judge science fairs.

16. Jim Friborough asked about the status of the logo contest — Rapp replied no response yet, but it is still open.

17. Rapp placed the meeting in recess until the results of the student paper presentations judging are available.

18. Student winners announced were Annise Evans (UALR-undergraduate) and Gary Fuller (UALR-GIT-graduate) — announced by Ed Dale. Several members simultaneously raised a point of order that two undergraduate awards (life sciences and physical sciences) should be given. The committee will meet again and resolve the issue.

19. President Rapp adjourned the meeting at 12:46 pm.

MEMBERS 1991

Roger William Abernathy - Arkansas State University/regular
Stephen R. Adkins - University of Central Arkansas/regular
Sam Allen - University of Arkansas at Little regular
Belle Huffman Allen - Hendrix College, regular
Robert T. Allen - University of Arkansas at Fayette regular
Robbie C. Anderson - University of Arkansas at Little regular
Cynthia Ann Abbott - University of Arkansas at Fayette regular
John T. Annulis - Arkansas Tech University/regular
Edmond R. Bacon - University of Arkansas at Fayette/regular
Robert Balin - University of Arkansas at Fayette/regular
Claude B. Baker - University of Arkansas/regular
Max L. Baker - University of Arkansas/regular
Kenneth M. Dale - University of Arkansas/regular
William H. Baltazar - University of Arkansas/regular
Gayle Baker - Arkansas State University sustaining
Harvey E. Barton - Arkansas State University sustaining
Adolphina H. Bates - University of Arkansas at Little regular
Vernon Beelde - Arkansas State University regular
Judith W. Bean - Hendrix College, regular
Dayton L. Bean - Hendrix College, regular
John D. Bennett - Arkansas State University sustaining
Ann Marie Perkins Benson - University of Arkansas/regular
Hal Bergel - University of Arkansas at Fayette regular
C. Bhuvanakumar - University of Arkansas at Fayette/regular
Emeline Biddle - University of Arkansas/regular
George T. Blevins - Arkansas State University/regular
Vera Bozman - Arkansas State University regular
Marlynn Bolduc - Arkansas Tech University/regular
Laurence J. Boucher - University of Arkansas at Little regular
William R. Bowen - University of Arkansas at Fayette regular
Robert E. Bowling - University of Arkansas/regular
Leo M. R. Brown - University of Arkansas/regular
Patricia C. Brown - University of Arkansas/regular
James J. Brown - Arkansas Tech University/regular
Wilfred J. Brathtwaite - Arkansas Tech University Hospital/regular
Margaret J. Brockle - Arkansas Tech University/regular
James J. Brigg - Arkansas Tech University/regular
Arthur J. Brown - University of Arkansas at Little regular
Susan G. Brown - University of Arkansas at Little regular
William D. Brown - University of Arkansas at Little regular
Charles T. Bryant - Arkansas Tech University/regular
Gayle Burroughs - University of Arkansas at Fayette regular
Judy Caldwell - University of Arkansas at Fayette regular
Chie C. Chait - University of Arkansas at Fayette regular
Phyllis Chaffin - University of Arkansas at Fayette regular
Stanley L. Chapman - University of Arkansas at Fayette regular
David Chittenden - University of Arkansas at Fayette regular
Colin C. Chisum - University of Arkansas at Fayette regular
Cindy Cissel - Arkansas State University/regular
Frances E. Clayton - University of Arkansas/regular
Malcolm K. Cleveland - University of Arkansas/regular
Betty S. Cochran - University of Arkansas/regular
Richard A. Cohn - University of Arkansas/regular
Larry Coleman - University of Arkansas/regular
B. R. College - University of Arkansas/regular
Robert L. Cook - University of Arkansas/regular
Janice Lorraine Cooper - University of Arkansas/Medical regular
Robert M. Cordova - University of Arkansas/Medical regular
Calvin Cowlin - University of Arkansas/Medical regular
William Cowley - University of Arkansas/Medical regular
Bob W. Cowling - University of Arkansas/Medical regular
Robert T. Crone - University of Arkansas at Little regular
Donald M. Culwell - University of Arkansas at Fayette regular
Edward G. Dale, Jr. - University of Arkansas at Fayette regular
Fred Daley - University of Arkansas at Fayette regular
James D. Daniels - University of Arkansas at Little regular
Jerry A. Darby - University of Arkansas at Fayette regular
Pat Darby - University of Arkansas at Fayette regular
Stanley M. Davey - University of Arkansas at Fayette regular
David L. Davids - University of Arkansas at Fayette regular
Leo Carson Davi - University of Arkansas at Fayette regular
Robert H. Dillay - University of Arkansas at Fayette regular
Ronald D. Dameron - University of Arkansas at Fayette regular
Peggy Rae Dorris - University of Arkansas at Fayette regular

Robert H. Doster - University of Arkansas at Fayette regular
Robert L. Douglas - University of Arkansas at Little regular
Michael F. Douglas - University of Arkansas at Fayette/regular
Marie Dugas - University of Arkansas at Fayette/regular
David G. Dussard - University of Arkansas at Pine regular
Robbie L. Eichberger - University of Arkansas at Pine regular
Thomas E. Ellis - University of Arkansas at Fayette regular
Husband E. Eldridge - University of Arkansas at Pine regular
Robert H. England - University of Arkansas at Pine regular
Daniel R. England - University of Arkansas at Pine regular
Don England - University of Arkansas at Pine regular
Lawrence Engleham - University of Arkansas at Pine regular
Claude E. Epenner - University of Arkansas at Pine regular
Ray Erickson - University of Arkansas at Pine regular
Kimil Chen Farnam - University of Arkansas at Pine regular
I. L. (Larry) Farnam - University of Arkansas at Pine regular
Sheila Fitzpatrick - University of Arkansas at Pine regular
M. Doug Fletch - University of Arkansas at Pine regular
Thomas W., III Fletcher - University of Arkansas at Pine regular
L. P. (Parr) Floyd - University of Arkansas at Pine regular
Thomas L. Foss - University of Arkansas at Pine regular
Paul B. Francis - University of Arkansas at Pine regular
Winifred Frazier - University of Arkansas at Pine regular
Kenneth E. Freeley - University of Arkansas at Pine regular
James W. Friborough - University of Arkansas at Pine regular
Arthur Fry - University of Arkansas at Pine regular
Gary Fuller - University of Arkansas at Pine regular
Kenesha Gage - University of Arkansas at Pine regular
Jack Gagen - University of Arkansas at Pine regular
Diana Gard - University of Arkansas at Pine regular
Emile R. Gentry - University of Arkansas at Pine regular
Michael George - University of Arkansas at Pine regular
John R. George - University of Arkansas at Pine regular
Colin R. Glee - University of Arkansas at Pine regular
John J. Glee - University of Arkansas at Pine regular
Loretta M. Gile - University of Arkansas at Pine regular
John T. Gilem - University of Arkansas at Pine regular
Kathy A. Gifford - University of Arkansas at Pine regular
S. K. (Guy) Gold - University of Arkansas at Pine regular
Kevin D. Golden - University of Arkansas at Pine regular
William E. Gray - University of Arkansas at Pine regular
Wayne L. Gray - University of Arkansas at Pine regular
Robert A. Green - University of Arkansas at Pine regular
G edgedon E. Griffin - University of Arkansas at Pine regular
Gaston Griggs - University of Arkansas at Pine regular
Max Gross - University of Arkansas at Pine regular
Peggy Guzzone - University of Arkansas at Pine regular
Joe T. Guzzone - University of Arkansas at Pine regular
Rao P. Guzzone - University of Arkansas at Pine regular
Bruce D. Guzzone - University of Arkansas at Pine regular
Edward H. Hanes - University of Arkansas at Pine regular
Jeffrey R. Hambrick - University of Arkansas at Pine regular
Richard H. Hanches - University of Arkansas at Pine regular
Joyce M. Hardin - University of Arkansas at Pine regular
George L. Hardin - University of Arkansas at Pine regular
Phoebe A. Hart - University of Arkansas at Pine regular
John M. Hart - University of Arkansas at Pine regular
Michael J. Harvey - University of Arkansas at Pine regular
Roger A. Hensley - University of Arkansas at Pine regular
Gary A. Heintz - University of Arkansas at Pine regular
Bryan Hennes - University of Arkansas at Pine regular
Christopher E. Hennes - University of Arkansas at Pine regular
Therese Haenelt - University of Arkansas at Pine regular
Larry Hinck - University of Arkansas at Pine regular
Dean E. Hite - University of Arkansas at Pine regular
Maxine R. Hite - University of Arkansas at Pine regular
Lisa J. Hite - University of Arkansas at Pine regular
Howard Hodges - University of Arkansas at Pine regular
Ray Hodges - University of Arkansas at Pine regular
William E. Hoot - University of Arkansas at Pine regular


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PROGRAM
Arkansas Academy of Science

Seventy-fifth Annual Meeting
5-6 April, 1991
University of Arkansas at Fayetteville
Fayetteville, Arkansas

Meeting concurrently with sessions of
The Collegiate Academy of Science

Friday, 5 April, 1991

Registration
Executive Committee
First Business Meeting
Exhibits and Refreshments

Paper Sessions

Students I - Botany/Ecology/Aquatics
Botany I - Biomedical
Microbiology
Physics/Engineering I
Fish Biology

Hospitality Hour
Sponsored by University of Arkansas for Medical Sciences
Banquet
Speaker: Dr. Terry Cole

Beauty on a Planetary Scale: A Summary of What Has Been Learned Through Remote Sensing of the Planets

Saturday, 6 April, 1991

Registration
Exhibits and Refreshments
Second Business Meeting

Paper Sessions

Students II - Vertebrates/Microbiology/Biomedical/
Chemistry/Engineering
Botany II - Science Education
Aquatics/Invertebrates
Chemistry/Engineering II
Vertebrates/Geology

Sigma Xi Breakfast

The traditional Sigma Xi Breakfast will be held at the Ozark Mountain Smokehouse on Dickson Street on Saturday, 6 April, 1991, beginning at 7:00 am.