

PROCEEDINGS OF THE TENNESSEE ACADEMY OF SCIENCE 1993

Sarah H. Swain, Secretary TAS

Middle Tennessee State University

TAS EXECUTIVE COMMITTEE MEETING

23 April 1993

The Executive Committee meeting of the Tennessee Academy of Science was called to order by President George Murphy at 4:15 PM CST in the Hazlewood Dining Room, James Union Building, Middle Tennessee State University, Murfreesboro, Tennessee, on 23 April 1993. Members present were George Murphy, President; Wilburn A. Slinger, President-elect; Michael L. Kennedy, Past President and 1993 Local Arrangements Chairman; Sarah H. Swain, Secretary; John Harris, Treasurer; Phyllis Kennedy, *Journal* Editor; Richard J. Raridon, Director of Collegiate Division; John R. Freeman and D. M. S. Bhatia, Members-at-large.

Minutes of the 19 November 1992 Executive Committee meeting had been mailed by the Secretary to Committee Members. No additions or corrections were made. Motion for approval of minutes was unanimously approved.

President Murphy explained that the Executive Committee position held by the Tennessee State Science Supervisor was presently unfilled. The new supervisor will serve when appointed. Past President Kennedy recommended that a letter of appreciation be sent to Geraldine Farmer recognizing her valuable service to TAS.

Treasurer John Harris presented the report which is printed in full within this publication. Financial support through institutional memberships and other external sources continues to be critically important in the absence of state support.

The following report was presented by *Journal* Editor Phyllis Kennedy:

"Volume 68(1) has been printed and mailed to the membership; the issue consisted of 32 pages and five articles. Expenditures for this issue were \$1841.86 (900 copies; \$58/page) for publication, \$42.08 for reprints, and \$200.34 for mailing (total = \$2084.28). Invoices totaling \$1449.00 (\$1230.00 for page charges and \$219.00 for reprints) were sent to authors, yielding a net cost of \$635.28 for 68(1).

Volume 68(2) is in-progress and will be mailed to the membership early May. This issue will consist of a profile of the President of TAS, minutes of Executive Committee meetings and the annual business meeting, abstracts of papers presented at the 102nd annual meeting, and three articles.

There are still four of the previously accepted manuscripts awaiting to be published. These manuscripts are scheduled for 68(3). Five additional accepted manuscripts await publication and are scheduled for 68(3) or 68(4). There are 26 manuscripts in author-revision (15 of these have been in this state since they were received from the former editor in May 1992) and six in review."

Editor Kennedy also reported that, as recommended by a TAS member, she submitted to *Current Contents* a request for inclusion of the *TAS Journal*. *Current Contents* denied the request stating that space limitations and other considerations prevented their accepting the request at this time but that application at a later time would be considered.

Wayne Stevenson, Director of the Visiting Scientist Program communicated by letter to President Murphy that funding difficulties have had a serious impact on the Tennessee Visiting Scientist Program. The program has been unable to reimburse travel expenses to visiting scientists this year; however, participants are encouraged to continue to respond to teacher requests for visits when possible. Director Stevenson provided a copy of a grant proposal submitted to the Tennessee Space Grant Consortium requesting support for the Tennessee Visiting Scientist Program. The decision of the Consortium has not yet been announced. Director Stevenson provided the Executive Committee with copies of comments from teachers whose students experienced a Visiting Scientist Program visit. The high praises and gratitude expressed by teachers clearly demonstrate the value of continuing to serve Tennessee students through this program.

Discussion by the Executive Committee focused on ways to continue the Visiting Scientist Program in spite of fiscal restraints. Members agreed that efforts should be made to reorganize the program in a way that reduces expenses, yet maintains this valuable service to Tennessee school children and teachers. President Murphy will investigate several possibilities suggested by the committee.

Collegiate Division Director, Richard Raridon, reported that the three collegiate regions, east, middle, and west, have meetings going on this month (April). All regions have been advised to stay within the \$300 budgeted for each region. Total expenses for the Collegiate Division are expected to remain under \$1000.

Junior Academy of Science Director, Jack Rhoton, submitted the following written report:

"The 1993 spring meeting of TJAS is scheduled for Friday, April 23, at Pearl Cohn High School in Nashville. Twenty-three students have been invited to present their research papers. Interest in the TJAS continues to grow. An effort will be made to encourage more student and teacher involvement in the Junior Academy of Science through newsletter articles and special mailings.

Since Dr. Geraldine Farmer is no longer with the Tennessee State Department of Education, all of the applications for the outstanding science teacher award were mailed to me. I appointed a panel of judges to evaluate each region of the three grand divisions of the state. The three teachers selected are as follows: James P. Frazier, Haywood High School, Brownsville; Lesia C. Lennox, Oakdale School, Oakdale; and Linda Phelps, Camden Central High School, Camden. Dr. Farmer is scheduled to present these awards during the TJAS meeting. We thank Geraldine for her outstanding support of the Junior Academy and wish her the best in her new role as supervisor of science in the Davidson County School System.

I have discovered through Dr. Larry Hall, Professor of Chemistry at Vanderbilt University, that \$70,000 will be given to the TJAS. These are funds left over from the International Science and Engineering Fair. Approximately \$3000 will be made available each year for students to carry out their research projects. The details of how these funds will be distributed will be determined later. These funds will serve as a major boost for the Junior Academy and will provide long-term financial support for student research."

Director Rhoton provided members of the Executive Committee copies of the program for the TJAS annual meeting. Student participants' names, schools, project titles, and abstracts are published annually in *Handbook and Transactions of the Tennessee Junior Academy of Science*.

[Secretary's note: On 30 April 1993, Director Rhoton reported that outstanding male and female presenters were selected at the TJAS annual meeting. They are: Fay White, Oak Ridge High School, Oak Ridge, and Tom Yao, Webb School of Knoxville, Knoxville. These students will receive honorary memberships in Tennessee Academy of Science and American Association for the Advancement of Science.]

President Murphy informed the Executive Committee that TAS member and former President Prem Kahlon prepared a proposal asking for International Science and Engineering Fair funds which remained after the fair was held at Vanderbilt University May 1992. The TAS Executive Committee is grateful for the efforts of Dr. Kahlon and others in attempting to secure these funds for TAS. If approved, funds will be used to support research and the Junior Academy.

OLD BUSINESS

TAS learned in April 1992 that state funding (\$19,000) would not be available for TAS in the proposed state budget. Attempts to have the funding included in the state education budget were blocked by the state finance committee. In spring 1993, urged by TAS President Murphy, Senator Andy Womack and Representative John Bragg agreed to submit bills to the Senate and House, respectively, requesting the restoration of \$19,000 to TAS. President Murphy sent a letter to the TAS membership including names and addresses of state senators and representatives to be contacted. A proposal was prepared for all Senate and House members and personally delivered by President Murphy to members of Ways and Means and Finance Committees. Even though no budget amendments have been approved in the last 23 years, President Murphy encourages members to continue to express their concerns to legislators. The Executive Committee discussed alternative sources of funds, such as institutional support, as ways to relieve the budgeting problems associated with the uncertainty of continued state support. It was noted that several institutions (Austin Peay State University, Middle Tennessee State University, Tennessee Technological University, University of Tennessee-Chattanooga) already provide support through institutional sustaining memberships. Plans to encourage other institutions to provide similar support were discussed.

NEW BUSINESS

Mike Kennedy, Local Arrangements Chairman, discussed plans for the 1993 annual meeting to be held 18-19 November 1993 on the Memphis State University campus.

The 1994 annual meeting is scheduled to be held in Nashville on the David Lipscomb University campus.

A motion to approve the planning of a joint meeting with the Kentucky Academy of Science (KAS) for 1995 was unanimously approved. TAS member and Past President, Ben Stone, has investigated the feasibility of a joint meeting with KAS officials. A number of planning details recommended by Ben Stone (Austin Peay State University) and Rudy Prins (Western Kentucky University) were discussed.

After lengthy discussion of budget considerations in view of the uncertainty of state support, several adjustments to the Treasurer's budget worksheet were recommended which would allow the Academy to continue to support all its programs to the extent possible. A motion to approve the proposed budget, as amended, was approved.

The need for an endowment fund for lifetime memberships, in order to establish long-term financial stability, was discussed. President Murphy appointed the following members to an ad hoc committee to plan and present such a recommendation to the membership at the November annual meeting: Ben Stone (Austin Peay State University), Gordon

Morris (University of Tennessee-Martin), John Harris, TAS Treasurer (Tennessee Technological University), and Mike Kennedy (Memphis State University).

A member to serve as Meeting Coordinator is needed for 1993-1995 (3-year term). Suggestions should be sent to President Murphy.

The need to rejuvenate the TAS membership drive was discussed, and several suggestions were recommended for consideration by the Membership Committee.

President-elect Sliger reported the tentative program plans for the 1993 annual meeting to be held at Memphis State University. Dr. Arch Johnson, Director of the Center for Earthquake Research, has accepted the Academy's invitation to present the keynote address at the annual meeting.

The April 1993 Executive Committee meeting of the Tennessee Academy of Science adjourned at 9:00 PM CST.

TAS EXECUTIVE COMMITTEE MEETING

18 November 1993

The 18 November 1993 meeting of the Tennessee Academy of Science Executive Committee was called to order by President George Murphy at 4:00 PM in the Presidential Board Room of the University Center on the Memphis State University (MSU) campus, Memphis, Tennessee. Members present were George Murphy, President; Wilburn A. Sliger, President-elect; John W. Harris, Treasurer; Sarah H. Swain, Secretary; Michael L. Kennedy, Past President and Local Arrangements Chairman; Phyllis Kennedy, *Journal* Editor; Jack Rhoton, Director of Junior Academy; Wayne Stevenson, Director of Visiting Scientist Program; David Lumsden, John Freeman, and D.M.S. Bhatia, Members-at-large; Howard Freeman, Meeting Coordinator.

Local Arrangements Committee Chairman, Michael Kennedy, welcomed the Executive Committee and Tennessee Academy of Science to the Memphis State University campus. President Murphy expressed appreciation on behalf of the Executive Committee for the dinner provided by MSU and MSU Provost, Dr. Ivan Legg.

Minutes of the April 1993 Executive Committee meeting had been mailed by the Secretary to Executive Committee members. Motion for approval of minutes was unanimously approved.

COMMITTEE REPORTS AND OLD BUSINESS

The Treasurer's report was presented by John W. Harris, Treasurer, and is shown in its entirety at the end of these minutes. Treasurer Harris explained that the \$70,000 shown under "Disbursement" represents a sum received by the Academy from the International Science and Engineering Fair (ISEF) which has been invested in Vanguard Star Fund. Earnings from these funds will be used to support the science projects of high-school students and the operation of the Junior Academy beginning 1 July 1994. The amount of \$21,414.92 under "Receipts" includes \$19,000.00 appropriated by the State of Tennessee. \$5000.00 listed as "Sustaining Memberships" represents the contributions of \$1000.00 each from five institutions: Austin Peay State University, Middle Tennessee State University (MTSU), Tennessee Technological University, University of Tennessee at Chattanooga, and University of Tennessee at Martin. President Murphy expressed appreciation for the support provided by these institutions.

A proposal for the reinstatement of funds for the Visiting Scientist Program was submitted by James E. Drewry, Director, Oak Ridge Institute for Science and Education (ORISE). The estimated costs of operating the Visiting Scientist Program are summarized in the following table:

Estimated Expenses for Operation of Tennessee Visiting Scientist Program Academic Year 1993-1994

Activity	Estimated expense
Printing roster and flier	\$2,000
Postage for roster and flier	500
Visitors' travel expense reimbursements	2,500
Operating costs: clerical support	0*
TOTAL COST	\$5,000

*ORISE will contribute staff and materials required for operation of the program.

Budget increases were requested by the directors of the Collegiate Division and the Junior Academy. Substantial increases in monetary support for the Junior Academy, the Visiting Scientist Program, publication of the *Journal*, and the Collegiate Division are reflected in the proposed 1993-1994 budget. A motion to accept the Treasurer's report and the recommended 1993-1994 budget was approved.

RECOMMENDED BUDGET FOR 1993-1994

Secretary	\$ 500
Treasurer	1,500
Junior Academy	6,000
Visiting Scientist Program	5,000
Journal	15,200
Research	1,000
Annual Meeting	2,000
Collegiate Division	1,500
Board Meetings	1,000
AAAS	500
Audit Fee	575
Annual Dues/Fees	150
TOTAL	\$34,925

Treasurer Harris reported that the Academy would seek a suitable bond to protect the Academy's accounts. He recommended that two signatures be required to remove any principal from the fund. A motion that the second signee on the Trust Account be the secretary was unanimously approved. The Executive Committee also passed a motion to approve the concept of bonding the treasurer, if the proposed Constitution is approved in the general meeting of the Academy, 19 November 1993.

Committee member Jack Rhoton suggested that special thanks be given to Larry Hall, Director of the International Science and Engineering Fair, and to Prem Kahlon and the Tennessee Academy of Science Research Committee for their efforts in acquiring the ISEF funds for the Tennessee Academy of Science.

President Murphy informed the Executive Committee of efforts now underway to gain permission from the Tennessee Board of Regents to allow MTSU to serve as the fiscal agent for the Academy for 1994-1995 and beyond to insure annual funding for the Academy. The initial request is for the addition of \$19,000 to the MTSU budget as a special allocation item. The amount is the same as that provided until 1991 through the budget of the State of Tennessee Department of Education. Dr. James E. Walker, MTSU President, recently supported the request in a letter to Acting Chancellor Rhoda. A motion that, if approved by the Tennessee

Board of Regents, MTSU serve as fiscal agent for Tennessee Academy of Science was approved by vote of the Executive Committee.

The possibility of establishing a separate interest-earning account for an endowment fund for lifetime memberships was discussed. President Murphy reminded the Committee that an ad hoc committee was formed in April 1993 to make recommendations regarding the establishment of such a fund. Treasurer Harris reported that to date 70 life memberships provide a total contribution of \$10,600. A motion to invest the entire sum of \$10,600 into an interest-bearing account, to add future life-membership contributions to the account, and to require two signatures for the removal of funds from the account was approved.

The following report was presented by Phyllis Kennedy, *Journal* Editor:

"Since the 1992 Annual Meeting of the Tennessee Academy of Science, four issues (volume 68) of the *Journal of the Tennessee Academy of Science* have been printed and mailed. Volume 68 consisted of 136 pages and was printed at a total cost of \$8766.45. The number of pages in each issue and the expenses and income for each issue are presented in Table 1.

All manuscripts that were accepted prior to 1 June 1992 have been published. Currently, there are 37 manuscripts on file in the editorial office. Of these, 19 are in author-revision."

An itemized accounting of expenses and charges for volume 68 of the *Journal* was presented to the Executive Committee by the Editor. Editor Kennedy recommended that the Executive Committee consider employing a press to print and mail future issues of the *Journal*. Such action would place the continued publication of the *Journal* in a stable position if the need arises to change editors. The job of the Academy's Managing Editor would be to insure that manuscripts would be ready to print and would not require further revision after being submitted to the press. After lengthy discussion the consensus of the Executive Committee was to explore the feasibility of incorporating this change into the budget as soon as practical.

Editor Kennedy also recommended the establishment of second-class postage for mailing of the journal. The Executive Committee approved a motion to authorize Treasurer Harris to acquire the second-class postage permit if the constitutional revision permitting the recommended changes related to editors passes in the November 1993 annual meeting. President Murphy expressed appreciation to Phyllis Kennedy for her dedication to the publication of the *Journal*.

The following report was presented by Wayne Stevenson, Director of the Tennessee Visiting Scientist Program:

"The Tennessee Visiting Scientist (TVS) program is administered by the Science/Engineering Education Division (SEED) of the Oak Ridge Institute for Science and Education (ORISE) and supports visits by scientists, engineers, physicians, and other professionals to elementary, middle, and junior and senior high schools throughout the state. The Academy was unable to fund the TVS program during the 1991-1992 and 1992-1993 academic years. ORISE was able to provide \$2,000 of support for the program in 1991-1992 but was unable to provide funds in 1992-1993. Many teachers who expected to invite scientists to their classrooms were disappointed to learn that the program was not operating.

Due to the program's uncertain funding, ORISE began establishing procedures to make it possible to receive support for the TVS program from multiple sources. Because ORISE operates as a U.S. Department of Energy (DOE) facility, their approval had to be granted before such funds could be sought. With DOE's approval, ORISE formally submitted a proposal to the Academy in November 1993. ORISE is also negotiating with other organizations for supplemental funds.

The program will be restored as soon as funding is received from the Academy or other sources. When the program is operational, a notice will be sent to teachers who have previously requested lectures announcing

TABLE 1. Summary of expenses and charges for volume 68 of the *Journal of the Tennessee Academy of Science*.

Item	68(1)	68(2)	68(3)	68(4)
Date of publication	January 1993	April 1993	July 1993	October 1993
Number of copies printed	900	900	900	900
Number of pages in issue (excluding four cover pages)	32	40	28	36
Cost of typesetting	--	--	\$500.00	\$500.00
Cost of camera work	\$55.96	\$58.75	\$38.57	?
Cost of printing	\$1785.90	\$2079.22	\$1658.41	\$2089.64
Total cost of publication	\$1841.86	\$2137.97	\$2196.98	\$2589.64
Cost per page	\$57.56	\$53.45	\$78.46	\$71.93
Page charges from authors	\$1230.00	\$900.00	\$660.00	\$1305.00
Number of authors paying:				
\$15 per page	2	0	4	0
\$45 per page	2	1	1	6
\$90 per page	1	2	1	1
Cost of publication minus page charges	\$611.86	\$1237.97	\$1536.98	\$1284.64
Cost of producing reprints	\$42.08	\$25.00	\$36.77	?
Charges for reprints	\$219.00	\$135.00	\$221.00	\$277.00
Mailing costs	\$200.34	\$137.36	\$119.35	?

that the Tennessee Visiting Scientist program is open for business! A similar announcement will be sent to all speakers on the roster.

Teacher comments provided on program evaluation forms indicate that the TVS program is very valuable and an important enhancement to the education of many Tennessee students. Without this program many students would have little or no direct contact with the scientific community other than through their teachers. Or, as expressed by a teacher who was concerned about the program's future, "Please continue this wonderful service to our school—we desperately need your program and others like it." ORISE is pleased that the program will be restored, and we know many Tennessee teachers will be excited."

Director of the Collegiate Division, Dr. Richard Raridon, submitted the following report:

"The Eastern Regional meeting of the Collegiate Division was held at the University of Tennessee at Chattanooga (UTC) on 23 April 1993. Twenty-three papers were presented by students from four schools. Dr. Dan Barnett has resigned as regional sponsor and Dr. R. Gary Litchford of UTC has agreed to assume that position.

The Middle Regional meeting was held on 30 April 1993 at Austin Peay State University (APSU). Twenty-nine papers were presented by students from six schools. Dr. Fred Matthews of APSU continues as regional sponsor.

The Western Regional meeting was held on 24 April 1993 at Christian Brothers University. Twenty-three papers were presented by students from four schools. Dr. Charles J. Biggers of Memphis State University continues his long and successful tenure as regional sponsor."

The Director of the Junior Academy, Jack Rhoton, presented the following report:

"The 1993 spring meeting of the Tennessee Junior Academy of Science was held on Friday, 23 April 1993, at Pearl Cohn Comprehensive High School in Nashville. A total of 40 papers were submitted from seven schools and 23 were selected by a panel of readers to be presented at the annual meeting. The two top presenters at the annual meeting were Ms. Foy White, Oak Ridge High School, Oak Ridge, Tennessee; and Mr. Tom Yao, Webb School of Knoxville, Knoxville, Tennessee. The title of Ms.

White's paper was "Population Ecology of *Peromyscus leucopus*, *Microtus pinetorum*, *Blarina brevicauda*, *Peromyscus nuttalli*, and *Rattus norvegicus* in an Abandoned Landfill." "The Characterization and Identification of Nodulin-26 and Some Homologues by Use of Antibody Probes" was the title of Mr. Tom Yao's research. Both papers were published in the 1993 *Handbook and Transactions of the Tennessee Junior Academy of Science* along with the three other papers of the top five winners. Also, the abstract of each presenter at the annual meeting was printed in the *Handbook*. The *Handbook* was sent to all high school science departments as identified in the Tennessee State Department of Education's *Directory of Public Schools, Approved Non-public and Special State Schools*.

Two of the TJAS winners will be presenting their papers at the American Junior Academy of Science Conference in San Francisco, California in February 1994. Matthew F. Rose, Memphis University School, will be presenting a paper entitled "Regional Differences in pH in Rain, Surface, and Tap Water." Leslie Simmons will be presenting her work on "The Effects of Garlic Juice on *Escherichia coli* and *Staphylococcus aureus*."

Three outstanding science teachers were recognized at the Junior Academy meeting. The three teachers honored were as follows: James P. Frazier, Haywood High School, Haywood County; Lesia C. Lennex, Oakdale High School, Morgan County; and Linda S. Phelps, Camden Central High School, Benton County. Each received a framed certificate and a check in the amount of \$100.00. We are indebted to the Tennessee State Department of Education for their assistance in selecting these outstanding teachers.

Efforts have been made to disseminate information more widely concerning TJAS and to bring the program to the attention of more teachers in Tennessee. In addition to disseminating TJAS information via the *Handbook*, the program was also described in the *Sciencing Quarterly* and sent to 4,200 teachers and schools in the state. Also, information about TJAS was shared with teachers during the Tennessee Science Teachers Conference in Nashville on 4-5 November 1993. It is hoped that these efforts, along with the cash assets donated by the 1992 International

Science and Engineering Fair to TAS, will heighten interest in TJAS and stimulate and improve research by secondary students."

Director Rhoton also reported that \$200.00 would be provided by the Academy for each of the two students attending the American Association for the Advancement of Science meeting in San Francisco. The Executive Committee agreed that additional funds to support travel expenses for these students should be included in future budget requests.

Tennessee Junior Academy of Science
Proposed Budget 1993-1994

I. Travel expenses	\$2,128
A. Annual meeting	
1. Students, teachers, parents who drive	
25 x 250 miles x 0.22 = \$1,375	
25 x \$12 for meals = \$300	
Total = \$1,675	
2. Director	
Overnight lodging = \$40	
Meals (4) = \$25	
600 miles x 0.22 = \$132	
Total = \$197	
B. Director, annual meeting of Executive Committee, planning of Junior Academy program	
Total = \$256	
II. Salaries and honoraria	\$1,030
A. Secretary	
Total = \$800	
B. Judges (3), readers (3), local arrangements	
Total = \$230	
III. Office supplies	\$480
IV. Medals, certificates, support for two students to attend National Junior Academy	\$487
V. Handbook	\$1,875
A. Printing, estimates = \$1,800	
B. Mailing, estimate = \$75	
TOTAL BUDGET REQUESTED	\$6,000

The following was submitted by Eugene A. Kline, Chairman of the Auditing Committee:

"The Auditing Committee consisting of Dr. Robert Martin, Dr. R. K. Fletcher, and myself have had the financial records of Tennessee Academy of Science examined by a professional auditor. He has concluded that the receipts and disbursements records for the fiscal year ending 30 June 1993 correctly reflects the cash position of the organization. He also found the accounting system to be well maintained. The Auditing Committee has also reviewed the report and agrees with the professional auditor. The Committee recommends that the Academy accept the treasurer's report of the Academy for the fiscal year ending 30 June 1993 both for its correctness and good maintenance."

President Murphy reported that no nominations were received from the Fellows Committee.

The Membership Committee reported the addition of 94 new members whose names will be published in the April 1994 issue of the *Journal*.

The Necrology Committee reported the deaths of the following members: Stuart Maher, C. L. Baker, and Jimmy Little.

The Nominating Committee will present the following slate of officers to the membership in the annual meeting, 19 November 1993:

Wilbur A. Sliger, President
Diane Nelson, President-elect
Sarah H. Swain, Secretary
John W. Harris, Treasurer.

Prem. S. Kahlon submitted the following report from the Research Committee:

"A sum of \$70,000 was received by the Academy from the International Science and Engineering Fair (ISEF). This award was made to the Academy in response to a proposal submitted by a subcommittee of the ISEF Steering Committee composed of David Wilson of Vanderbilt University, Prem Kahlon of Tennessee State University, and Ron Robertson of Austin Peay State University. The income from these funds will be available for high school students' science projects and competition for prizes at the local and regional science fairs. The proposal stipulates that these awards be need based for good proposals and not necessarily meritorious awards for excellent proposals.

The Academy also received \$500 from the AAAS for science projects. Unfortunately, we have received only six applications from students, even though I mailed about 200 letters to science teachers in the state requesting their help in generating applications. I am enclosing a copy of the proposal that was submitted to ISEP for the Academy's record. The members of the Research Committee will meet on 19 November 1993 to review the applications. The Committee is recommending four awards totaling \$1800.00."

Resolutions submitted by the Resolutions Committee were read by the Secretary and approved by the Executive Committee. The resolutions will be presented to the Tennessee Academy of Science membership for approval at the annual business meeting.

The following resolution was submitted by the Tennessee Association of Science Department Chairs, Dr. Oliver Yates, Chairman: "that all institutions move toward a 12 contact hour full-time workload for science faculty." The resolution will be presented to the membership at the annual business meeting 19 November 1993. A motion to endorse the resolution of the Tennessee Association of Science Department Chairs was approved by vote of the Executive Committee.

The Executive Committee discussed the proposed joint meeting with the Kentucky Academy of Science in 1995. The Committee had approved the concept in its April 1993 meeting. President Murphy will bring the question before the membership in the form of a motion in the annual business, 19 November 1993.

NEW BUSINESS

The need to clarify the duties of the Meeting Coordinator was discussed. President Murphy recommended that Howard Freeman, current Meeting Coordinator, and Wilburn A. Sliger develop guidelines for the duties of the Meeting Coordinator within the concept that the role of the Meeting Coordinator is to give continuity to meeting planning.

President-elect Sliger expressed concern that no recommendations for Fellows had been submitted in the last 2 years. The Committee agreed that the membership should be notified at mid-year to give consideration to the nomination of Fellows.

President-elect Sliger recommended compiling a complete *Journal* holding (from 1912) and designating one state library to serve as archivist for the Tennessee Academy of Science.

The benefit of inviting another scientific organization or group (e.g., state aquatic biologists) to hold a joint meeting with the Tennessee Academy of Science was discussed. That such joint meetings had ever been held was not known by any Committee member in attendance. Some concern that the inclusion of another large scientific group might dilute the importance of the annual meeting of the Academy was expressed. It was suggested that such a group could request to be represented as a "section" within the framework of the annual meeting of the Academy. It was agreed that the Constitution should be reviewed before any action is taken.

The 18 November 1993 meeting of the Executive Committee of the Tennessee Academy of Science was adjourned by the President at 7:50 PM CST.

THE ONE-HUNDRED THIRD MEETING OF THE TENNESSEE ACADEMY OF SCIENCE

18-19 November 1993
Memphis State University

The annual meeting of the Tennessee Academy of Science was held on the Memphis State University (MSU) campus, Memphis, Tennessee, on 18-19 November 1993. Dr. Michael L. Kennedy served as chairman of the Local Arrangements Committee. Dr. Wilburn A. Sliger, President-elect, served as program chairman.

The Executive Committee meeting was held Thursday evening, 19 November 1993, in the University Center Presidential Boardroom on the MSU campus. The general session, luncheon, and section meetings were held on the MSU campus Friday, 19 November 1993. The general session began at 9:20 AM (CST), with President-elect Wilburn A. Sliger presiding, in the University Center Ballroom. MSU Provost, Dr. Ivan Legg, welcomed the members of the Tennessee Academy of Science to the campus. The plenary session began at 9:30 AM (CST) with the keynote address, "Earthquakes Where They Shouldn't Be", delivered by Dr. Archibald C. Johnston, Executive Director of the Center for Earthquake Research and Information, MSU. The annual business meeting followed immediately with President George Murphy presiding. Entertainment was provided during lunch by Dr. Robert R. Marchini, MSU Department of Physics, who presented a program titled, "The Science of Magic". Section meetings convened in the Ellington Biology Building Friday afternoon as listed in the printed program.

ANNUAL BUSINESS MEETING 19 November 1993

President George Murphy called the annual business meeting of the Tennessee Academy of Science to order and determined by the attendance that a quorum was present. A motion to suspend the reading of the minutes of the 1992 meeting was approved. The Secretary's minutes, published in the April 1993 issue of the *Journal of the Tennessee Academy of Science*, were approved. The Treasurer's report was presented by Treasurer, John Harris. Phyllis Kennedy, *Journal* Managing Editor, provided the Editor's report. Director Jack Rhoton reported the activities of the Junior Academy of Science, and Director Wayne Stevenson reported on the status of the Visiting Scientist Program. All reports were approved by the membership and are recorded in full in the minutes of the 18 November 1993 meeting of the Executive Committee.

Ninety-four new members, whose names are listed in the April 1993 issue of the *Journal*, were approved for membership. A motion to suspend the reading of the names was approved.

The following resolutions, submitted by the Resolutions Committee and read by the Secretary, were accepted:

RESOLUTION OF APPRECIATION

"WHEREAS, the Tennessee Academy of Science has served as a forum for the presentation and discussion of independent research for the scientific community of Tennessee for eighty-one years, and WHEREAS, the support of the Academy's meetings, its activities and publications by the State Legislature has been appreciated, and WHEREAS, the budget request of the Tennessee Academy of Science was excluded from the 1993-1994 funding of the State Department of Education, and WHEREAS, State Senator Andy Womack of the 16th Senatorial District and State Representative John T. Bragg of the 48th House District sponsored legislation for a line-item budget amendment to restore funds

for the Tennessee Academy of Science, and WHEREAS, Senator Womack and Representative Bragg were successful and the Tennessee Academy of Science received funding in the amount of \$19,000 for programs support, and WHEREAS, Senator Womack and Representative Bragg are highly respected legislators who have been strong supporters of education at all levels within the state, BE IT RESOLVED, therefore, that the Tennessee Academy of Science expresses its sincere appreciation to Senator Womack and Representative Bragg for their continued concern and support."

RESOLUTION OF APPRECIATION

"WHEREAS, the Tennessee Academy of Science is enjoying a most pleasant, profitable, and well-organized series of meetings as Memphis State University, and WHEREAS, the success of these meetings has resulted mainly from the efforts of the officers of the respective sections; the Local Arrangements Committee representing Memphis State University, composed of Dr. Michael L. Kennedy, chairman, Dr. Melvin Beck, Dr. Delano Black, Ms. Martha Brown, Dr. Michael Daley, Dr. David Lumsden and Mr. Timothy Steward; and Program Chairman, Dr. Wilburn A. Sliger; from the recognition given the meetings by the press, television, and radio stations; and from the generous hospitality of the host institution, Memphis State University, and its Provost, Dr. Ivan Legg, BE IT RESOLVED, therefore, that the Tennessee Academy of Science expresses its sincere appreciation to these and all others who contributed to the success of these meetings."

A motion to approve the revised constitution, mailed to the membership with the July 1993 issue of the *Journal*, was approved by vote. President Murphy expressed appreciation to Wilburn A. Sliger and other members of the ad hoc committee for constitution revision for their work on the revision.

The following resolution was submitted by the Tennessee Association of Science Department Chairs, Dr. Oliver Yates, Chairman: "that all institutions move toward a 12 contact-hour full-time workload for science faculty." A motion to support the concept of the resolution was approved by the Executive Committee in its meeting 18 November 1993. A motion to retain the word "science" was approved following discussion of the appropriateness of the wording. Discussion by the membership resulted in additional wording changes with the final statement approved by vote as follows:

"The Tennessee Academy of Science recommends that all institutions move toward a maximum of a 12 contact-hour load for science faculty and all other faculty."

The membership expressed its support for the proposed joint meeting with the Kentucky Academy of Science in 1995. A motion to approve the meeting passed.

President Murphy asked members to stand and observe a moment of silence for those known members of the Academy who had died during the past year: Stuart W. Maher, C. L. Baker, and Jimmy Little.

The membership passed a motion to approve the slate of officers presented by Nominating Committee chairman, Michael L. Kennedy: President: Wilburn A. Sliger, President-elect: Diane R. Nelson, Secretary: Sarah H. Swain, Treasurer: John W. Harris.

President Murphy expressed appreciation to the Executive Committee for its work during 1993. A plaque was presented to Past President Michael L. Kennedy in recognition of his dedicated service to the Academy as 1992 President.

The President's gavel was passed from 1993 President George Murphy to in-coming 1994 President Wilburn A. Sliger who adjourned the meeting at 11:30 AM CST.