

PROCEEDINGS OF THE TENNESSEE ACADEMY OF SCIENCE 1997

Sarah H. Swain, Secretary TAS

Middle Tennessee State University, Murfreesboro, Tennessee

TAS Executive Committee Meeting
18 April 1997

The Executive Committee meeting of the Tennessee Academy of Science was called to order by President Michael Daley at 6:20 PM in Conference Room 336, Avon Williams Complex, Tennessee State University, Nashville, Tennessee, 18 April 1997. Members present were Michael L. Daley, President; Eugene Kline, President-elect; David H. Kesler, Past President; Sarah H. Swain, Secretary; John W. Harris, Treasurer; Phyllis Kennedy, Managing Editor; Jack Rhoton, Director of Junior Academy; Steven Murphree, Meeting Coordinator; Linda Jordan, State Department of Education Science Supervisor; Darlene Loprete, Member-at-large. Also attending were George Murphy, Strategic Planning Committee Chairperson; Michael Kennedy, Strategic Planning Committee Member; Richard Gross, Local Arrangements Committee Chairperson, Motlow State Community College; Wayne Wofford, newly appointed Managing Editor.

REPORTS FROM OFFICERS AND DIRECTORS

Minutes of the 21 November 1996 Executive Committee meeting had been mailed by Secretary Sarah H. Swain to committee members. A motion to approve the minutes passed.

Treasurer John W. Harris presented the following 15 April 1997 report:

CASH BALANCE - 1 July 1996 \$47,088.23

RECEIPTS

Membership Fees	\$9,875.00
Institutional Dues	5,500.00
Library Subscriptions	2,580.00
Journal Sales	15.00
Interest Earned, Trans Financial Bank	530.81
Dividends Earned, J.C. Bradford	
Money Market	938.36
Interest Earned, J.C. Bradford Treasury Note	368.75
Dividends Earned, Vanguard Star Fund	2,223.12
Journal Page Charges	3,102.50
Contributions	240.00
Annual Meeting Registration/Lunch Fees	4,270.00
TOTAL RECEIPTS	29,643.54

TOTAL CASH AVAILABLE \$76,731.77

DISBURSEMENTS

Journal Printing Costs	\$5,703.64
Tennessee Junior Academy of Science	5,719.35
Annual Meeting	4,697.36

Treasurer's Expenses	896.14
Secretary's Expenses	558.07
Insurance	185.00
Dues and Fees	20.00
Board Meeting Expenses	396.95
Auditor's Fee	900.00
AAAS Meeting	397.44
Web Site Maintenance	191.14
TOTAL DISBURSEMENTS	19,665.09

CASH BALANCE - 15 April 1997 \$57,066.68

Receipts	\$29,643.54
Disbursements	19,665.09
Cash Increase	9,978.45

BREAKDOWN OF HOLDINGS

U. Memphis Account (Journal)	\$1,711.49
U.S. Postal Service, Memphis	207.31
TTU Account	602.14
Checking Account, Trans Financial Bank	3848.06
Savings Account, Trans Financial Bank	23,355.99
Money Market Fund, J. C. Bradford	27,341.69

TAS HOLDINGS as of 15 April 1997 \$57,066.68

TJAS TRUST FUND (Vanguard Star Fund)
(6,941,591 shares owned as of 03/31/97)

Account Value as of 09/30/96	\$105,728.90
Deposits (Capital Gains Reinvested)	
12/31/96	6,407.81
Disbursements (Dividend Distributions)	
12/31/96	2,223.12
Account Value as of 12/31/96	110,093.63
Account Value as of 03/31/97	110,857.21

LIFE MEMBERS TRUST FUND (J. C. Bradford & Co.)
(Ten 3-yr. U.S. Treasury Notes @ \$1000 ea,
Date of Issue - 11/15/94)

Value of Notes as of 09/30/96	\$10,159.00
Disbursements (Interest Income) 11/15/96	368.75
Estimated Annual Income	738.00
Value of Notes as of 12/31/96	10,116.00
Value of Notes as of 03/31/97	10,088.00

(\$2,650.00 of the J. C. Bradford Money Market Fund is earmarked for this fund)

TOTAL VALUE OF HOLDINGS
as of 15 April 1997 \$178,011.89

A motion to accept the Treasurer's report was approved. A motion to reinvest the annual income from the Life Members Trust Fund back into the fund was approved. After discussion to amend the recommended budget so that a balanced budget could be proposed, the following budget for 1997-1998 was accepted:

RECOMMENDED BUDGET FOR 1997-1998

	Projected Income (1997-1998)
Membership Dues	\$10,500.00
Sustaining Members	6,000.00
Annual Meeting Fees	4,000.00
Journal Page Charges	4,250.00
Library Subscriptions	2,600.00
Interest Earned	1,900.00
Exhibitors' Fees	200.00
Contributions	300.00
TJAS Trust Fund	8,500.00
TOTAL	\$38,250.00

Account	Projected Expenditures (1997-1998)
Secretary	600.00
Treasurer	1,400.00
Junior Academy	8,500.00
Visiting Scientist Program	5,000.00
Journal	15,000.00
Annual Meeting	4,000.00
Collegiate Division	1,200.00
Board Meetings	700.00
AAAS	500.00
Audit Fee	900.00
Annual Dues/Fees	150.00
Insurance	300.00
TOTAL	\$38,250.00

Phyllis Kennedy, Managing Editor, presented the following report: "The printing of all issues of volume 71 (1996) is completed. Issues 1-3 have been mailed. Issue 4 is being prepared for mailing. Volume 71 consisted of 108 pages; eight articles and Academy business (abstracts from meetings, minutes, etc.) were printed in this volume. The four issues were printed at a cost of \$2488.21, \$2457.71, \$2141.85, and \$2457.00, respectively (total printing cost for the volume = \$9544.77). The eight manuscripts published in volume 71 generated \$3065.00 in page charges.

During 1996, 21 manuscripts were submitted to the *Journal*. To date, nine manuscripts have been submitted in 1997. Currently, there are four accepted manuscripts on file.

A 3-year contract between TAS and Allen Press, Inc., has been established for the production and mailing of the *Journal*. Detailed information on production has been given to Allen Press. Allen Press currently is typesetting a sample manuscript for approval of format for all manuscripts.

Copy for 72(1) and marked manuscripts for 72(2) will be mailed to Allen Press by 1 May 1997. Issue 1 of volume 72 will contain the profile of the new President, minutes from 1996, abstracts from the 1996 annual meeting, and a list of new members for 1996. This issue is tentatively scheduled for completion by 1 July 1997. Issue 2 will contain three or four articles and is tentatively scheduled for completion and mailing by 1 September 1997.

The new Managing Editor, Dr. Wayne Wofford, is now han-

dling new submissions and manuscripts in review or in author revision. The outgoing Managing Editor, Dr. Phyllis Kennedy, is working with Allen Press and handling the production of issues 1 and 2 of volume 72. After production details and procedures are finalized with Allen Press, the new Managing Editor will handle the production of issues 3 and 4 of volume 72 and issues thereafter. The transition between Managing Editors is proceeding smoothly.

Three Section Editors are stepping down at the end of their 3-year term in April 1997. Dr. Phillip J. Lorenz at The University of the South, Sewanee (History of Science); Dr. Kirk Menser at Austin Peay State University, Clarksville (Math and Computer Science); and Dr. Gerald L. Vaughan at The University of Tennessee, Knoxville (Zoology I) are gratefully acknowledged for their service to the Academy.

The 3-year term for most of the Section Editors ends in April 1997. Therefore, the following nominees for a 3-year term (1 May 1997-1 May 2000) as Section Editors are submitted for approval to the Executive Committee:

Botany	James Caponetti, Department of Botany, The University of Tennessee, Knoxville, TN
Cell and Molecular Biology	Charles J. Biggers, Department of Biology, The University of Memphis, Memphis, TN
Chemistry	Martin V. Stewart, Department of Chemistry Middle Tennessee State University, Murfreesboro, TN
Engineering	Michael L. Daley, Department of Electrical Engineering, The University of Memphis, Memphis, TN
Geology and Geography	David Lumsden, Department of Geological Science, The University of Memphis, Memphis, TN
History of Science	James X. Corgan, Department of Geology and Geography, Austin Peay State University, Clarksville, TN
Math and Computer Science	William K. Glunt, Department of Mathematics and Computer Science, Austin Peay State University, Clarksville, TN
Medical Sciences	Robert O'Bannon, Department of Biology, Lee College, Cleveland, TN
Physics and Astronomy	Martha Weller, Department of Chemistry and Physics, Middle Tennessee State University, Murfreesboro, TN
Science and Math Teachers	Sarah F. Barlow, Department of Biology, Middle Tennessee State University, Murfreesboro, TN
Zoology I	James Huggins, Department of Biology, Union University, Jackson, TN"

Managing Editor Kennedy provided a copy of the Services Agreement between Allen Press, Inc. and the Tennessee Academy of Science to each member of the Executive Committee. The Executive Committee passed a motion to approve two printings (2 issues per printing) per year, beginning with volume 72 (1997). A motion was passed to approve the Section Editor nominees for a 3-year term, as listed in the Managing Editor's report.

The Executive Committee wishes to acknowledge the services of the three Section Editors whose terms end April 1997. The Committee thanks Dr. Phillip J. Lorenz, The University of the South, for his service to the TAS History of Science Section, Dr. Kirk Menser, Austin Peay State University, for his service to the TAS Math and Computer Science Section, and Dr. Gerald L. Vaughan, The University of Tennessee, Knoxville, for his service to the TAS Zoology I Section.

Tennessee Junior Academy of Science Director, Jack Rhoton, presented the following report: "The 1997 spring meeting of the Tennessee Junior Academy of Science (TJAS) is scheduled for Friday, 18 April 1997, at Pearl-Cohn High School in Nashville. A total of twenty-seven students have been invited to present their research papers. This year we received forty-nine research papers from students throughout the state.

Two of the 1996 TJAS winners presented their papers at the American Junior Academy of Science Conference in Seattle, Washington, during the week of 18-22 February 1997. Matthew F. Rose, Memphis University School, presented a paper entitled, 'Retinal-Cognin and Melatonin Effects on Embryonic Chick Retinal Cell Aggregation.' Emmanuel Chang presented his work on 'Localization of Enzyme Serine Protease (Kallikrein).'

During the April 18 meeting a framed certificate and a small honorarium (\$100) will be presented to an outstanding secondary science teacher from each region of the three grand divisions of the state. The recipients of this year's awards are as follows: Deborah R. Ivens (Chemistry), McMinn County High School, Athens; Glynn A. Burton (Physics and Calculus), Brentwood High School, Nashville; Melinda Keller (AP Biology), Germantown High School, Memphis. The TAS Distinguished Teacher Awards recognize teachers for their outstanding contribution to science education and for stimulating and inspiring students to an active interest in science. This year the Awards Committee received twenty-one nomination packets.

TJAS Director Rhoton expressed appreciation to faculty members from the Biology, Chemistry, and Physics Departments at East Tennessee State University who served as TJAS judges. President Daley, who attended the 18 April 1997 TJAS meeting, praised TJAS for its program of high quality papers and a well-organized meeting.

An addendum to the above report announced the names of two students selected as the outstanding male and female presenters at the 1997 TJAS annual meeting: Rebecca Taylor, Knoxville and Emmanuel Chang, Antioch. Each student will receive a year's membership in TAS, including copies of the *Journal*.

Visiting Scientist Program Director, Linda Cain, submitted the following report: "The Office of University and Science Education of the Oak Ridge National Laboratory assumed responsibility for the administration of the Visiting Scientist Program in January of 1997. Since that time the following has been accomplished: Twenty-five visits by Visiting Scientists have been confirmed. Fliers were developed promoting the Visiting Scientist Program; over 3500 were mailed to regional teachers. Over 300 directories have been distributed. Announcements have been

placed in professional journals for teachers. Information and brochures have been distributed at professional meetings across the state and at all Oak Ridge National Laboratory education programs. Teachers are beginning to schedule for fall.

The major goal for the Visiting Scientist Program is to increase the number of visits. To do this, more Visiting Scientists will be added to the program and the program will be given more visibility. A new solicitation for Visiting Scientists will be carried out and new programs that meet Visiting Scientist guidelines will be identified and included in the brochure. Strategies used to increase visibility will include: (1) increased distribution of brochures, and (2) increased distribution of information at meetings and through publications. There is renewed interest in the Visiting Scientist Program and we are optimistic that it will again become a high visibility program."

Richard Raridon, Director of the Collegiate Division, reported that meetings were in progress during April and that a full report would be prepared for the November Executive Committee meeting.

Richard Raridon also serves as TAS delegate to the American Association for the Advancement of Science (AAAS) and the National Association of Academies of Science (NAAS) and submitted the following report:

"I represented TAS at the AAAS/NAAS meeting held in Seattle, WA, on 13-17 February 1997. TAS is affiliated with AAAS through representation in Section Y, General Interest in Science and Engineering. At the Section Y meeting, James McCullough of the National Science Foundation presided and announced that Norine E. Noonan of Florida Institute of Technology will be the new Chair. Two members who are active in NAAS were elected as Fellows of AAAS: Gene R. Kritsky, Indiana Academy, and Dudley F. Peeler, Jr., Mississippi Academy. Several proposals were made for symposia to be sponsored by the Section at next year's AAAS meeting which will be the 150th anniversary of AAAS. The meeting will be in Philadelphia where the first meeting was held in 1848. Subsequent meetings will be in Anaheim, CA, Washington, DC, and San Francisco, CA.

NAAS sponsored a workshop at the meeting that addressed some of the problems confronting local academies about funding activities. At the annual business meeting of NAAS, Judy Parker of the Minnesota Academy of Science was chosen as President-elect. Ertle Thompson will replace me as AAAS Council Delegate. There is still a problem with the Directory and Proceedings and hopefully it will be resolved soon.

I also attended the poster session at which the two students from Tennessee were present. The paper by Emmanuel Yih-Herng Chang was entitled, 'Localization of Enzyme Serine Protease (Kallikreins),' and the paper by Matthew Rose was entitled, 'Melatonin and Retinal Cognin Promote Cell Aggregation in Embryonic Chick Retina in vitro.' This is the second year for Emmanuel to attend and the third year for Matthew to attend the American Junior Academy of Science sponsored by NAAS."

REPORTS FROM COMMITTEES

The TAS Education Committee is an approved standing committee of the Academy. The charge of this committee is to: comment on science education issues in Tennessee, serve as a resource to the State Department of Education, and to be responsible for oversight of the Visiting Scientist Program. Members of the 1997 committee are: Bernard Benson, University of Tennessee-Chattanooga, Teacher Preparation Academy, committee chair; Michael L. Daley, University of Memphis De-

partment of Electrical Engineering, 1997 TAS President; Jack Rhoton, East Tennessee State University, Director, Junior Academy of Science; Robert Marlowe, University of Tennessee, Chattanooga Department of Physics and Astronomy; Linda Jordan, Science Consultant, State Department of Education; Robert L. Hartshorn, Chair, Tennessee Science Teachers Association Higher Education Committee. The Education Committee is reviewing the proposed Science Licensure Standards and will present its recommendation to the TAS membership at its annual meeting in November.

George Murphy, committee chair, presented the report of the Strategic Planning Committee to the Executive Committee. A lengthy discussion of the major recommendations in the report is summarized below: 1) better organize membership recruitment efforts by regionalization of recruitment efforts, maintaining an updated website and brochure, and the designation of on-campus representatives; 2) establish a standing publicity committee to make TAS information available to news organizations, publicize TAS activities, such as the Visiting Scientist Program, and maintain the TAS website possibly with a quarterly newsletter and a database of academy members and their areas of expertise; 3) make the annual meeting more attractive by considering metropolitan meeting sites, a two-day annual meeting, and planning symposia that would enhance attendance; 4) promote alliances with other state groups by creating an advisory group of affiliated societies that would have representation on the Executive Committee, and encouraging other state groups to become affiliated with TAS; 5) encourage industrial membership and recognizing the value of such a group through a seat on the Executive Committee or an advisory board; 6) establish and promote significant endowment with plans for a permanent fund; 7) increase promotion of currently successful activities, such as the Visiting Scientist Program, Collegiate and Junior Academies; 8) initiate new and special features in the journal, such as sponsored symposia, special issues on a given topic, articles on science teaching; 9) increase efforts to generate funds to support and expand academy programs; 10) establish a finance oversight committee that would identify sources and ways to finance academy initiatives; 11) establish a long-term planning committee, composed of past presidents and others, to insure that the academy responds to changing needs of members and opportunities for service; 12) increase the base and continuity of governance by expanding the membership of the Executive Committee and extending terms of offices to two or more years.

The Committee on Awards, chaired by David Kesler, provided copies of the guidelines for four awards that were approved by TAS membership at the November 1996 annual meeting. After discussion, it was agreed that TAS Secretary Swain could receive nominations, with the specified documentation, from the membership. A motion to present nominee names and documentation to the Executive Committee at its April 1998 meeting was approved.

Chair John Harris, Committee on Procedures and Operations, provided a draft of the "Operations Manual" that outlines the general duties and specific responsibilities of TAS officers, directors, and section chairpersons. Chair Harris asked the members of the Executive Committee to review the draft and offer suggestions. The manual can be updated periodically, as needed, and made available to new officers.

OLD BUSINESS

Locations for future TAS annual meetings are planned as

follows: 1997 Motlow State Community College, Tullahoma; 1998 Tennessee Technological University, Cookeville; 1999 University of Tennessee at Memphis, Memphis, 2000 TAS hosts a joint meeting with Kentucky Academy of Science.

NEW BUSINESS

A request to consider the establishment of a section for graduate students in the Collegiate Division West annual meeting was discussed. Such a section would provide a forum for some that might not participate at the TAS annual meeting. The Executive Committee recommends that the Collegiate Division West accept participation by graduate students on a trial basis, without obligation for the other Collegiate Divisions to do likewise. A decision to continue with the plan, or not, will be made after review of the trial meetings.

The Executive Committee discussed ways to increase the budgets for the three Collegiate Divisions. A nominal fee charged to each participant could increase funds without discouraging participation. Chairpersons for each of the three Collegiate Divisions will be contacted for information regarding the financial needs of each division.

President Daley presented a summary of the responses by TAS members to a questionnaire distributed to the membership during the November 1996 annual meeting at Sewanee. The following summarizes the responses of eighty-four (84) respondents: (Survey questions in italics)

1) Would you like the Executive Committee of TAS to take a more or less active role in the issues listed below?

Education at college/university,

secondary, elementary levels: most said "more"

Teaching of Evolution: most said "more"

Evolution and Environment: most said "more"

Use of Technology: "no opinion" or "more"

2) Do you agree or disagree that evolution, as defined as changes in gene frequencies, should be taught as fact? 3) Do you agree or disagree that creationism should be taught in science classes? Seventy-nine (79) respondents agreed evolution should be taught and disagree that creationism should be taught. However, some of the respondents suggested that the use of the word "fact" was not entirely correct. Perhaps, instead of "fact", the word "principle" or "theory" should be used. Five (5) respondents indicated that both evolution and creationism should be taught equally as science.

4) In what way can the TAS Executive Committee serve you better? Most did not respond with a comment. Of those that did respond, most indicated that the committee is doing a good job. A very few, 3, indicated that TAS should not be involved in the issue of the teaching of evolution.

5) Are there other areas of the Academy you would like to see emphasized or strengthened? If so, what are they? Most did not respond with a comment. Of those that did respond, some indicated that a two-day annual meeting might be better. Also, in addition to the fall meeting, some type of meeting in the spring, regional or statewide, was suggested.

6) Do you think that social and behavioral scientists should also participate in the Academy? Twenty (20) respondents had no opinion. Twenty-nine (29) respondents indicated "no". Thirty-five (35) respondents indicated "yes". (It was noted that the same five respondents who indicated that creationism and evolution be taught equally responded "no" to this question.)

At 10:35 PM CST President Michael Daley adjourned the 18 April 1997 meeting of the Executive Committee of the Tennessee Academy of Science.

TAS EXECUTIVE COMMITTEE MEETING 20 November 1997

The Executive Committee meeting of the Tennessee Academy of Science (TAS) was called to order by President Michael Daley at 7:15 PM in the Jack Daniels Room, Forrester Student Center, Motlow State Community College, Tullahoma, TN, 20 November 1997. Those in attendance were President Michael Daley, President-elect Eugene Kline, Past President David Kesler, Treasurer John W. Harris, Secretary Sarah H. Swain, Managing Editor Wayne Wofford, Junior Academy of Science Director Jack Rhoton, Collegiate Division Director Richard Raridon, Members-at-large Lori Slavin and Ted Lundy, Meeting Coordinator Stephen Murphree, Science Consultant Linda Jordan, Tennessee State Department of Education. Motlow State Community College President Frank Glass provided dinner for the Executive Committee earlier in the evening.

Secretary Sarah Swain had mailed minutes of the 18 April 1997 Executive Committee meeting to committee members. A motion to approve the minutes passed.

President-elect Kline and Local Arrangements Committee Chairperson Dick Gross, Motlow State Community College, reported on preparations for the annual meeting. Refreshments to be served morning and afternoon of the annual meeting will be provided by Motlow State Community College. Program changes were reported to the Executive Committee and will be announced in the business meeting at the annual meeting Friday, 21 November 1997. President-elect Kline recommended Dr. Duane D. Miller, guest speaker for the 1997 TAS Plenary Session, to the Executive Committee for consideration for honorary membership in TAS. A biographical sketch and professional vita provided evidence of Dr. Miller's personal and professional achievements. A motion to award TAS honorary membership to Dr. Duane Miller was approved. The award will be announced at the 1997 annual business meeting.

Meeting Coordinator Stephen Murphree announced plans to collaborate with the current Local Arrangements Chair, Richard Gross, in the preparation of a detailed chronology of duties for the Local Arrangements Chairperson. The document will be incorporated into the TAS Operations Manual.

Plans for TAS participation in the 150th birthday celebration of the American Association for the Advancement of Science (AAAS) were discussed. A video taping of the attending TAS membership will be made at the 1997 Plenary Session. TAS affiliation with AAAS will be acknowledged and the membership will extend its "Happy Birthday" wish to AAAS.

Treasurer Harris presented the following:

TREASURER'S REPORT

15 November 1997

John W. Harris, Treasurer

CASH BALANCE - 1 JULY 1997 \$49,250.26

RECEIPTS

Membership Fees	\$3,625.00
Institutional Dues	5,000.00
Library Subscriptions	1,380.00

Interest Earned, Trans Financial Bank	172.85
Dividends Earned, J.C. Bradford Money Market Fund	341.01
Journal Page Charges	633.25
Contributions	140.00
Annual Meeting Registration and Luncheon Fees	1,830.00

TOTAL RECEIPTS 13,122.11

TOTAL CASH AVAILABLE \$62,372.37

DISBURSEMENTS

Tennessee Junior Academy of Science Annual Meeting	\$4,074.74
Treasurer's Expenses	82.49
Secretary's Expenses	820.17
Security Bond	526.14
Travel	100.00
Web Site Maintenance	167.96
Check Order	279.20
	39.00

TOTAL DISBURSEMENTS \$6,089.70

CASH BALANCE - 15 NOVEMBER 1997 \$56,282.67

Receipts	\$13,122.11
Disbursements	6,089.70
Cash Increase	7,032.41

BREAKDOWN OF HOLDINGS

U.S. Postal Service, Lawrence, KS	\$500.00
TTU Account	522.61
Checking Account, Trans Financial Bank	4,446.79
Savings Account, Trans Financial Bank	22,800.61
Money Market Fund, J. C. Bradford	28,012.66

TAS HOLDINGS as of 15 November 1997 \$56,282.67

TJAS TRUST FUND (Vanguard Star Fund)

(6,941.591 shares owned as of 09/30/97)	
Account Value as of 03/31/97	\$110,857.20
Deposits (Capital Gains Reinvested)	0.00
Disbursements (Dividend Distributions) 06/30/97	1,735.40
Account Value as of 06/30/97	120,297.77
Account Value as of 09/30/97	129,599.50

LIFE MEMBERS TRUST FUND (J. C. Bradford)

(Ten 3-yr. U.S. Treasury Notes @ \$1,000 ea., Date of Issue - 11/15/94)	
Value of Notes as of 03/31/97	\$10,088.00
Disbursements (Interest Income) 05/15/97	368.75
Estimated Annual Income	738.00
Value of Notes as of 06/30/97	10,063.00
Value of Notes as of 09/30/97	10,022.00

TOTAL VALUE OF HOLDINGS

as of November 15, 1997 \$195,904.17

Treasurer Harris reported that TAS bulk mail permits were issued for Murfreesboro, TN and Cookeville, TN. Mail must be

handled personally by Treasurer Harris or Secretary Swain. Several weeks should be allowed for delivery. Treasurer Harris' report was accepted.

Junior Academy of Science Director Jack Rhoton presented the following report: "The 1997 Spring meeting of the Tennessee Junior Academy of Science (TJAS) was held on Friday, 17 April, at Pearl Cohn Comprehensive High School in Nashville. A total of forty-seven papers were submitted. Twenty-five of these papers were selected by a panel of readers to be presented at the annual meeting. The two top presenters were Rebecca Taylor, Webb School of Knoxville, Tennessee, and Emmanuel Chang, Martin Luther King, Jr., Nashville, Tennessee. The title of Ms. Taylor's paper was 'An Experimental Method for Calculating a Sphere's Moment of Inertia.' 'Soil Vapor Extraction: A Three-Dimensional Local Equilibrium Mathematical Model for Hazardous Waste Site Remediation' was the title of Mr. Chang's research. Both papers were published in the 1997 *Handbook of the Tennessee Junior Academy of Science*, along with five other papers of the top six 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 and math departments identified in the Tennessee State Department of Education's *Directory of Public Schools. Approved Non-public and Special State Schools*.

Three science teachers were recognized at the Junior Academy meeting. The teachers honored were as follows: Deborah R. Ivens (Chemistry), McMinn County High School, Athens; Glynn A. Burton (Physics and Calculus), Brentwood High School, Nashville; Melinda Keller (AP Biology), Germantown High School, Memphis."

TENNESSEE ACADEMY OF SCIENCE OUTSTANDING SCIENCE TEACHER AWARD

"Alan Redmond has been named recipient of the prestigious 1997 Tennessee Academy of Science Outstanding Science Teacher Award. Redmond, who is a Sevier Middle School science teacher in Kingsport, Tennessee, will receive the award on November 21, 1997 during the annual meeting of the Tennessee Academy of Science at Motlow State Community College, Tullahoma, TN. Begun in 1997, the award program is designed to recognize outstanding science teachers. This award will be given annually to one Tennessee science teacher who has made significant contributions to the teaching of science. In addition to the recognition, Redmond will receive a plaque.

The criteria for this award include the candidate's education record, involvement in professional organizations, special awards or recognition, contributions to the teaching profession, philosophy of teaching and learning, and letters of support."

TJAS REQUEST FOR FUNDING

"Seven high school students have requested research grants to assist their efforts in developing research projects for the TJAS program. Each student has presented a sound description of the project general purpose and goals, statement of need, and the nature of the research. The following students have requested funding as of 20 November 1997:

<u>Student</u>	<u>Title of Research</u>	<u>Amount</u>
Trevor Dennison	Distortion of Radio Waves by Jupiter	\$300.00
Julie Bales	The Effects of Electromagnetic Fields on DNA	\$300.00
Christine R. Donhardt	Effects of Grapefruit Antifeedants on the Second Instar Larvae of the Colorado Potato Beetle: a 3-yr. study	\$300.00
Susan Duffron	Distortion of Radio Waves by Jupiter	\$250.00
Steven Haynes	Of Mice and Mendel	\$300.00
Mary Kidd	The Effect of Potential Composite Sources on Acidity of Soil	\$300.00
Ashlee Dawn Miller	Lunar Luminosity versus Thermal Intensity	\$250.00
Christopher Obergas	The Advantages and Disadvantages of Growing Tomatoes by Hydroponics versus Traditional Methods	\$300.00
Jeremy Stout	A Comparison of Miocene Marine Mammals to Recent Marine Mammals	\$300.00
Mike Vaughn	Multiple Roles of Tyrosine-3Hydroxylase in <i>Drosophila melanogaster</i>	\$300.00
Mary Walker	Social Development and Altruism	\$300.00
Rebecca Marie Watson	Lunar Luminosity versus Thermal Intensity	\$250.00

I recommend the TAS Executive Committee approve the funding request made by each student. Total amount requested for all projects is \$3,450.00."

The Executive Committee accepted the report and voted to approve the funding as requested.

Managing Editor Wayne Wofford presented the following report: "The printing of all issues of volume 71(1996) is complete. These four issues were printed at a total printing cost of \$9544.77. The eight manuscripts published in volume 71 generated \$3065.00 in page charges. As approved by the Executive Committee on 18 April 1997, issues 1 and 2 of volume 72(1997) were published together to reduce printing and mailing costs. This printing contained three articles and consisted of 52 pages. These are the last issues handled by Dr. Phyllis Kennedy. Dr. Wayne Wofford will handle issues 3 and 4 of volume 72.

I am currently trying to build a database of potential reviewers for manuscripts submitted to the journal. This should be of great value to our Section Editors. I have forms ready to put out on the registration desk at the annual meeting.

I plan to invite the Section Editors to meet with me for a few minutes after the Plenary Session in the auditorium in order to meet them and get feedback from them as to any issues and concerns they might have.

I need to find a replacement for Dr. Michele Bernard, Section Editor for Zoology II. I plan to attend the business meeting to ask for volunteers to serve in this capacity.

I am currently managing 14 manuscripts. Of these, eight were originally received by Dr. Phyllis Kennedy and passed on to me. I have received an additional six for consideration for publication since assuming the position of Managing Editor. At this point, 5 have been accepted for publication, 3 have been accepted with revision, and 2 have been rejected. Areas represented by the submissions include Geology/Geography, Botany, Zoology I, Zoology II, Medical Sciences, Chemistry, and Engineering."

The Executive Committee accepted the Managing Editor's report.

Collegiate Division Director, Richard Raridon, presented the following report: "The Western Regional Meeting was held at LeMoyne-Owen College on March 22, 1997. Twenty-seven papers were presented by students from six schools. A number of papers represented collaboration between The University of Tennessee, Memphis and Christian Brothers University.

The Eastern Regional Meeting was held at Roane State Community College on 18 April 1997. Eleven papers were presented by students from five schools.

The Middle Regional Meeting was held at Austin Peay State University on 19 April 1997. Twenty-two papers, including two from graduate students, were presented by students from five schools.

The regional sponsors are Dr. Fred Matthews, Austin Peay State University, Dr. Gary Litchford, The University of Tennessee at Chattanooga, and Dr. Charles Biggers, The University of Memphis."

The report of the Collegiate Director was accepted by the Executive Committee.

The Executive Committee discussed the appropriateness of selling advertisements to support the publication of a printed program for the Western Collegiate Division meeting. The committee agreed that no ads should be sold until the question could be resolved. Treasurer Harris will investigate the matter and report to the Executive Committee.

Visiting Scientist Program (VSP) Director, Linda Cain (also Director, Office of University and Science Education, Oak Ridge National Laboratory) reported by memo that over 2500 announcements for VSP had been sent to elementary, middle, and high schools during fall 1997. Director Cain reported that twenty-five VSP-sponsored presentations had been made since April. An amount of \$7500 was requested for program support.

REPORTS OF COMMITTEES

Committee on Proceedings and Operations: John W. Harris, Chair, presented copies of the Operations Manual and addenda with revised duties for President and Past President. Harris will revise the manual as needed.

Education Committee: Bernard Benson, Chair, submitted the following report: "The charge of the TAS Education Committee is to comment on science education issues in Tennessee, to serve as a resource to the State Department of Education, and to be responsible for oversight of the Visiting Scientist Program. Members of the committee include: Bernard W. Benson, Chair, Michael Daley, Robert Marlowe, Jack Rhoton, and Linda Jordan and Robert Hartshorn serving ex officio.

The primary activity of the committee during this year was to work closely with the State Department of Education on Science Licensure Standards. The committee reviewed the draft standards and made extensive recommendations and suggestions.

Following is an example of a recommendation which was forwarded to Karen Weeks on 13 May 1997: Recommend the following be added as a Guideline to the Licensure Standards: Institutions preparing teachers are encouraged to evaluate and redesign existing programs in accordance with the patterns of changing emphasis specified in the National Science Education Standards. Particular attention should be given to reflection on the standards in the areas of science teaching, professional development for teachers of science, and assessment in science education.

Change the following: Where know appears as the action verb in the content standards, change to known and be able to apply knowledge about. (end recommendation)

On June 23, 1997 a letter of support on behalf of the Education Committee was sent to Karen Weeks. In this letter I stated that 'we endorse the content and intent of the proposed Science Licensure Standards.' Furthermore, 'we wholeheartedly endorse the concept of uniform standards for science teachers licensure and recognize that preservice and inservice teacher education must be consistent with the national, state, and local initiatives in science education reform. We further acknowledge the obligation of all institutions of higher education to maintain quality programs of teacher education through a process of substantive assessment and review based on approved standards.'

In addition to the above activity, Michael Daley, as a member of the committee, has made progress on designing an oversight review process for the Visiting Scientist Program."

The Executive Committee approved a motion to accept the report. *Auditing Committee:* Committee member R. K. Fletcher, Jr. submitted the following report: "The Audit Committee consisting of Dr. David Yarborough and I had an audit as required by the Academy for the year ending 30 June 1997 prepared by Mr. James F. McKinnie, MBA, Cookeville, Tennessee. He examined the receipts and disbursements records and found everything in order and the accounting system well maintained. The committee recommends approval of the financial report based upon this audit. The committee also wishes to commend Dr. John W. Harris, Treasurer, for his efforts and meticulous job in keeping good financial records for the Academy."

Included in the report is the following from auditor James F. McKinnie: "I have examined the receipts and disbursements records of the Tennessee Academy of Science for the fiscal year ended 30 June 1997, and in my opinion the attached Cash Receipts and Disbursements Statement correctly reflects the cash position of the organization at 30 June 1997. The entire accounting system is well maintained and to be commended. I have prepared a Return of Organization Exempt from Income Tax, including a Schedule A. This form 990 must be filed with the Internal Revenue Service no later than December 15, 1997."

TENNESSEE ACADEMY OF SCIENCE

Cash Receipts and Disbursements

For Year Ended 30 June 1997

Receipts:

Membership Dues	\$15,955.00
Capital Gains - Vanguard	6,407.81
Annual Meeting Fees	4,270.00
Dividends - Vanguard	3,958.52
Journal Page Charges	3,580.50
Interest Earned	2,734.97
Library Subscriptions	2,640.00
Contributions	240.00
Misc.	20.00
Total Receipts	\$39,806.80

Disbursements:

Tennessee Junior Academy of Science	\$8,282.16
Printing & Publications	7,889.26
Visiting Scientist Program	5,000.00
Annual Meeting	4,697.36
Treasurer's Office Expense	1,591.05

Accounting Fee	900.00
Collegiate Division	800.00
Secretary's Office Expense	575.11
AAAS Expenses	397.44
Insurance Bond	370.00
Board Meeting	355.55
Annual Dues & Fees	142.50
Misc.	191.14
Total Disbursements	\$31,191.57
Cash Increase from Operations	\$8,615.23
Cash Balance, July 1, 1996	\$159,806.37
J. C. Bradford - Unrealized Loss	[\$115.00]
Vanguard - Unrealized Gain	\$9,564.18
Cash Balance, 30 June 1997	\$177,870.78

TENNESSEE ACADEMY OF SCIENCE
Summary of Cash Accounts
30 June 1997

Trans Financial Bank
Cookeville, TN 38501

NOW Account	\$4,412.61
Savings Account	16,731.10
Total	\$21,143.71

Tennessee Technological University
Cookeville, TN 38505

Agency Account	\$334.29
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University of Memphis
Memphis, TN 38100

Agency Account	-0-
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Vanguard Financial Center
Valley Forge, PA 19482-2600

Vanguard Star Fund	\$118,562.37
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U.S. Postal Service
Memphis, TN 38100

Postage Account	\$95.76
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J. C. Bradford & Co.
Cookeville, TN 38501

Cash Account	\$27,671.65
United States Treasury Note	\$10,063.00
Total	\$37,734.65

Cash Balance, 30 June 1997	\$177,870.78
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The Executive Committee approved a motion to accept the report. *Fellows Committee*: Fellows Committee Chair, S. K. Ballal, submitted the following report: "The 1997 Fellows Com-

mittee (Drs. S. K. Ballal, Chair, Dr. Charles R. McGhee, and Dr. Bernard Benson) is pleased to place in nomination the names of: Dr. Andrew Slinger, University of Tennessee at Martin; Dr. Phyllis Kennedy, University of Memphis; Dr. Eugene Kline, Tennessee Technological University. These members meet all of the criteria for Fellows, and based on their service to the Academy, are well deserving of the honor.

"It is also the opinion of the Committee to tighten-up the criteria for future selection by including the following statement in addition to the provisions of Articles 2 and 3: 1. Be a full, continuous and active member of the Tennessee Academy of Science for a minimum of fifteen years. This is required because sometimes the Committee receives self-nominations from members who barely meet the provisions, which is very easy to do, without any dedication to the welfare and sustenance of the Academy over any extended period of time. The supporting documents need to be submitted to the Fellows Committee when a member is recommended by the nominator."

A motion to nominate the three individuals recommended by the Fellows Committee was approved. Their names will be presented to the membership at the annual meeting. A second motion that the Fellows Committee continue to recognize significant length of service as a criterion, but without a change in the TAS Constitution, was also approved.

Necrology Committee: The Necrology Committee, Alexander Wells, Chair, submitted the following names: Dr. Aaron J. (Jack) Sharp, University of Tennessee-Knoxville, Department of Botany retiree and former TAS President; Dr. Richard Rush, Oak Ridge National Laboratory. A moment of silence will be observed in honor of these individuals during the annual meeting.

Nominating Committee: David Kesler, Chair, presented the following for consideration by the Executive Committee: John W. Harris, Treasurer; Sarah H. Swain, Secretary; Lori Slavin, President-elect. A motion to accept the recommendations of the Nominating Committee was approved.

Research Committee: No report was submitted by this committee.

Membership Committee: No report was submitted by this committee.

Resolutions Committee: The following Resolution of Appreciation was submitted by Sallie Noel, Resolutions Committee Chair: "WHEREAS, the Tennessee Academy of Science is enjoying a pleasant, profitable, and well-organized series of meetings at Motlow State Community College, 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 Motlow State Community College, composed of Chairperson Richard Gross, Bob Bates, Cheryl Gregory, Linda Harris-Young, Henry Johnson, Marcia Kribs, Kate Lapczynski, Barry McBurrough, Bob Reeder, Judy Taylor, and Harlon Stockton; and Program Chairperson, Eugene Kline; from the recognition given the meetings by the press, television, and radio stations; and from the generous hospitality of the host institution, Motlow State Community College, and its President Frank Glass; 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."

The Executive Committee approved the resolution to be presented to the membership at the annual meeting.

OLD BUSINESS

In response to recommendations made by the Strategic Plan-

ning Committee, George Murphy, Chair, the following were established as committees with the provision that the committee chair positions would become permanent Executive Committee positions upon vote by the membership next year: Financial Oversight Committee, Long Range Planning Committee, Publicity Committee, and Industry/Government Committee. A motion to establish the above as ad hoc committees for 1998, and to recommend to the membership for vote next year that the chairmanships become permanent Executive Committee positions, according to Article IX, Section I of the TAS Constitution, was approved.

Also, in response to a recommendation from the Strategic Planning Committee, the Executive Committee voted to approve the establishment of the position, Director of Electronic Communications, as an educational program. David Kesler has agreed to serve.

Problems associated with the administration of the Visiting Scientist Program were discussed at length by the Executive Committee. President Daley detailed his failed attempts to communicate with Director Cain. A motion to cease funding the Office of University and Science Education at Oak Ridge National Laboratory for the administration of the Tennessee Academy of Science Visiting Scientist Program was approved by vote.

Tennessee Technological University, Cookeville, has agreed to host the 1998 annual meeting. TAS will not hold its 1999 annual meeting at the University of Tennessee at Martin, as previously planned, due to scheduling conflicts. Instead, the University of Tennessee at Memphis is being considered as host for the 1999 annual meeting. Plans for a joint meeting with the Kentucky Academy of Science in 2000, to be hosted by TAS at the downtown Nashville campus of Tennessee State University, are being considered. The feasibility of a joint meeting with the Tennessee Science Teachers Association in 2001 was discussed.

NEW BUSINESS

Treasurer John Harris presented a revised membership form to be used as the TAS standard for membership application. The standard form would be used by all TAS officers and presented on the TAS Website. Discussion followed related to the desirability of a database that would allow lists to be generated based on academic or research interests. Such a database would be especially valuable to section editors trying to locate appropriate manuscript reviewers. President Daley recommended that Treasurer Harris and David Kesler, Director of Electronic Communications, work together to create a suitable form.

A recommendation to revise the Call for Papers form to indicate the graduate or undergraduate status of a student presenter was discussed. It was agreed that Local Arrangements Chairs should advise Section Chairs of guidelines to be used for judging student presentations.

The Executive Committee agreed that Motlow State Community College should be allowed to write an article for the *Journal* about hosting the 1997 annual meeting, including information about the college. The article would be sent to Wayne Wofford, Managing Editor.

President-elect Kline reported on his presentation on behalf of TAS to the Governor's Committee on Science and Technology, 16 June 1997. The committee was interested in how TAS might foster increased industrialization and technology in the state. President-elect Kline described the purposes and programs of TAS and answered questions from committee members. Kline referred to the TAS goal to "promote alliances with other state

groups with similar goals and objectives" (recommended by the 1997 Long-range Planning Committee) and described the award for an Outstanding Industrialist, recently established by TAS, as well as plans for an Industry/Government position on the Executive Committee.

A request from the Tennessee Entomological Society to become a TAS affiliate organization was approved by vote of the Executive Committee. President Daley adjourned the meeting at 10:45 PM CST.

THE ONE HUNDRED SEVENTH MEETING OF THE TENNESSEE ACADEMY OF SCIENCE 20–21 November 1997 Motlow State Community College, Tullahoma

The annual meeting of the Tennessee Academy of Science was held on the campus of Motlow State Community College, Tullahoma, Tennessee, 20–21 November 1997. Richard Gross served as chairperson of the Local Arrangements Committee. Eugene Kline, President-elect, served as program chairperson.

The Executive Committee meeting was held Thursday evening, 20 November 1997, in the Jack Daniels Room of the Forrester Student Center on the Motlow State Community College campus. The general session, business meeting, luncheon, poster sessions, and section meetings were held on the Motlow State Community College campus Friday, 21 November 1997. The general session began at 8:45 AM CST in Eoff Hall, Powers Auditorium, with a welcome from President-elect Kline. A. Frank Glass, President of Motlow State Community College, welcomed the TAS membership to the campus. The annual business meeting followed with TAS President Michael Daley presiding. The plenary session began at 9:30 AM with the keynote address given by Duane D. Miller, PhD, Van Fleet Professor at the University of Tennessee at Memphis. Dr. Miller's address was titled, "A Search for the Treatment of Obesity." Meeting attendees viewed posters displayed in Eoff Hall throughout the morning. Lunch was served to participants in the Forrester Student Center, followed by paper sessions that convened in Simon Hall as listed in the printed program.

ANNUAL BUSINESS MEETING 21 November 1997

President Michael Daley called to order the annual business meeting of the Tennessee Academy of Science at 9:10 AM CST in Eoff Hall Auditorium on the campus of Motlow State Community College, Tullahoma, and determined by the attendance that a quorum was present. Treasurer John W. Harris presented the Treasurer's report. Managing Editor for the *Journal of the Tennessee Academy of Science*, Wayne Wofford, presented a report. Managing Editor Wofford requested the help of the membership in building a database of potential reviewers. President Michael Daley presented the Distinguished Service Award to Phyllis Kennedy in recognition of her years of service as Managing Editor.

Director Jack Rhoton presented a report on the activities of the Junior Academy of Science. Alan Redmond, science teacher at Sevier Middle School, Kingsport, Tennessee, came forward to accept the Outstanding Science Teacher Award presented by Director Rhoton. Director Richard Raridon reported on the Colle-

giate Division meetings (East, Middle, and West) of 1997 and commended the regional coordinators for their work.

The Audit Committee report, read by President Daley, documented the financial stability of the Academy. A motion to accept the report was approved by the membership.

On the recommendation of the Fellows Committee, and with the approval of the Executive Committee, a motion was passed to designate the following members as Fellows of the Academy: Dr. Phyllis Kennedy, University of Memphis; Dr. Andrew Sliger, University of Tennessee at Martin; Dr. Eugene Kline, Tennessee Technological University.

President Daley reported the addition of 51 new members since the last meeting. A motion to accept the new members was approved. Names of new members will be printed in the *Journal*. A motion to suspend the reading of the names passed. A moment of silence was observed in remembrance of TAS members Aaron J. (Jack) Sharp and Richard Rush.

President Daley read the slate of officers presented by the Nominating Committee, and approved by the Executive Committee, as follows: Lori Slavin, President-elect; John W. Harris, Treasurer; Sarah H. Swain, Secretary. A motion to accept the slate was approved.

The following resolution, read by Secretary Swain, was accepted by motion:

“WHEREAS, the Tennessee Academy of Science is enjoying a pleasant, profitable, and well-organized series of meetings at Motlow State Community College, 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 Motlow State Community College, composed of Chairperson Richard Gross, Bob Bates, Cheryi Gregory, Linda Harris-Young, Henry Johnson, Marcia Kribs, Kate Lapczynski, Barry McBurrough, Bob Reeder, Judy Taylor, and Harlon Stockton; and Program Chairperson, Eugene Kline; from the recognition given the meetings by the press, television, and radio stations; and from the generous hospitality of the host institution, Motlow State Community College, and its President Frank Glass;

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.”

President Daley announced that, on the recommendation of the Long-range Strategic Planning Committee and with the approval of the Executive Committee, the committees listed below would serve as ad hoc committees during 1998. At the 1998 annual meeting these committee chairmanships would be presented to the membership for approval as permanent positions on the Executive Committee. Such an action would require an amendment to the TAS Constitution approved by the membership. The committees are as follows: Financial Oversight Committee, Long-range Planning Committee, Publicity Committee, and Industry/Government Committee. The establishment of a Director of Electronic Communication was also recommended as a permanent Executive Committee position.

The Executive Committee's decision to administer the Visiting Scientist Program (VSP) through volunteer regional coordinators was announced. The recommendation of the Executive Committee to cease funding the Office of University and Science Education at Oak Ridge National Laboratory for the administration of VSP was explained.

President Daley announced that the 1998 annual meeting of TAS would be held on the campus of Tennessee Technological University, Cookeville. The 1999 meeting is being planned on the University of Tennessee at Memphis campus. He expressed appreciation to the Executive Committee for its service in 1997. A plaque was presented to Past President David Kesler with praise for his dedicated service to TAS. Kesler, newly appointed Director of Electronic Communications, urged the membership to submit to the TAS database at the TAS Website, information important to VSP, the *Journal*, and other TAS activities. President Daley then passed the gavel to 1998 President Eugene Kline who led the membership in its videotaped salutation to the American Association for the Advancement of Science (AAAS) in honor of the 150th birthday of the organization. The meeting was adjourned at 9:45 AM CST.