

Proceedings of the Tennessee Academy of Science 2017

Teresa L. Fulcher, Secretary TAS

Pellissippi State Community College, Knoxville, Tennessee

Tennessee Academy of Science Executive Committee Meeting 21 April 2017

President-Elect Sandy Mehlhorn called the meeting of the Tennessee Academy of Science Executive Committee to order at 6:53 PM CST on the campus of Belmont University in the Janet Ayers Academic Center. Attendees were Past-President and Collegiate Division Director Fred Matthews, Treasurer Steve Murphree, Secretary Teresa Fulcher, Managing Editor Rachel Rigsby, Assistant Editor Amy Thompson, Junior Academy of Science Director Preston MacDougall, Electronic Communications Director Gilbert Pitts, Annual Meeting Coordinator J. Allyn Smith, Publicity Committee Chairperson Mandy Carter-Lowe, and Membership Committee Chairperson Karen Kendall-Fite. Prior to the meeting, the Executive Committee enjoyed a meal in the Jane Ayers Center. Minutes from the November 2016 Executive Committee had been approved by electronic vote of the Executive Committee.

Reports from Officers and Directors

Past President—Fred Matthews reported on easel replacement for use in the annual meeting poster session. Past President Matthews suggested that storage boxes for the easels be marked with Academy contact information to facilitate return if lost. Matthews also reported disbursement of the wooden easels to various sponsoring institutions and announced that additional easels are available.

President-Elect and 2017 Program Chairperson—Sandy Mehlhorn reported that the annual meeting would be held on Friday 17 November at The University of Tennessee, Martin. President-elect Mehlhorn reported that rooms had been reserved for the meeting and she was working to select a keynote speaker for the meeting.

Treasurer—Steve Murphree discussed the Treasurer's report provided below. Treasurer Murphree reported that the Middle Tennessee Science and Engineering Fair (MTSEF) has established a separate account and he thanked the Academy of behalf of the MTSEF for support during the transition. Treasurer Murphree also reported that he is working to separate expenses for our AAAS representative from the Junior Academy expenses. Treasurer Murphree reported that use of *Square* was successful at the 2016 meeting with only minor complications. Receipts from *Square* totaled \$1,814.63. Treasurer Murphree continues to work on an Academy budget and reminded members to request tax exempt forms for purchases. Gilbert

Pitts made a motion to accept the Treasurer's report. The motion was seconded by Fred Matthews and approved.

TAS Income and Expenses (7/1/2016 through 4/21/17).

Category Description	7/1/2016-4/21/2017
INCOME	
Annual Meeting Income-Misc	101.83
Annual Meeting Lunch	1,300.00
Annual Meeting Registration	2,929.00
Gift Received	7.00
Library Journal Subscriptions	1,100.00
Membership Dues	14,010.00
MTSEF	155.00
Other Income	1,834.63
Unrealized Gain	24,705.30
Vanguard Dividend Payment	4,669.93
TOTAL INCOME	50,838.69
EXPENSES	
Annual Meeting	7,591.08
Collegiate Division	186.87
Dues and Fees	200.00
Executive Committee Meetings	181.50
<i>Journal</i>	94.56
<i>Journal</i> Printing	7,601.20
Junior Academy of Science	5,086.17
Misc. Expenses	140.00
MTSEF	900.00
Science Fair	805.00
Unrealized Gain-Loss on Star Fund	4,299.09
Website	358.20
Due to Science Fair	2,531.23
TOTAL EXPENSES	29,974.90
OVERALL TOTAL	20,863.79

Managing Editor—Rachel Rigsby thanked Amy Thompson for serving as Assistant Editor for the *Journal*. Rigsby reported that Volume 90 Issues 3-4 will be combined. Rigsby stated that she was still working on an ethics state for the *Journal*. An ethics statement would allow the *Journal* to be listed in one additional database. Managing Editor Rigsby indicated that she is attempting to complete the Managing Editor's *Journal* set. Executive Committee members requested the volume and issue numbers that are missing so they can check their local academic libraries. Electronic Communications Director Pitts reported that *Journal* issues are available electronically back to 1952 with

only a few missing. It was noted that in 2009 the Executive Committee approved the posting of *Journal* issues older than five years. The importance of monitoring and verifying originality of submitted photographs and art for publication in the *Journal* was mentioned. The Managing Editor's report was approved.

Collegiate Division Director—Fred Matthews announced the location of the three spring Collegiate Division meetings: Pellissippi State, Belmont and Christian Brothers. Rachel Rigsby coordinated the Middle Tennessee meeting at Belmont and the meeting was held on the 8 April. Rigsby reported lighter attendance than usual due to conflicting meetings. Duane Hatch will resume as Middle Tennessee coordinator in 2018. The meeting at Christian Brothers was held on 1 April. The East Tennessee meeting was held earlier in the day on 21 April. Director Matthews also took time to thank the Executive Committee for their assistance with the annual meeting held in November.

Electronic Communications Director—Gilbert Pitts reported updates to the Executive Committee page of the TAS website and noted that most members have photos posted with their contact information. Director Pitts reported that he has updated pages of the website as requested. Pitts reported no requests for email accounts and limited activity on the Facebook page. Annual Meeting Coordinator Smith suggested that he would work to get the meeting program finalized earlier for posting on the website. Pitts said he generally leaves up the previous program until the current program is available. Director Pitts suggested that we solicit an individual to take meeting photographs for posting on the website and Facebook page. Publicity Chairperson Mandy Carter Lowe proposed promoting use of a TAS hashtag to allow participants to post photos and tweets regarding the meeting. Director Pitts noted that summary statistics from Midphase on visits to the website were not currently available. Director Pitts reported that he has continued the migration of the *Journal* to an accessible pdf format and currently issues from 1952 through 2010 are available.

Junior Academy of Science Director—Preston MacDougall reported that the Junior Academy meeting had been held earlier in the day at Belmont University, and 21 papers were presented. Winner of the competition was Elisabeth Ellis of Christ Presbyterian Academy, Nashville. Her paper was titled "The Effects of Over-the-Counter Medications on the Phenotypic Expression of *Drosophila melanogaster*". Seven presenters were named "runners up". Director MacDougall thanked the Academy for their support of the Junior Academy and noted that about \$5,000 had been invested in sending a team of students to the meeting of the American Junior Academy of Science (AJAS) in Boston, MA in February of 2017. Treasurer Murphree pointed out that the Vanguard account was established in part to support the Junior Academy. The winning presentation from the Tennessee Junior Academy of Science meeting receives \$500.00 plus a \$1000 stipend if they attend the AJAS meeting. Director MacDougall pointed out that the Tennessee Junior Academy of Science would be eligible to send additional teams to the AJAS if runners up were willing to pay for their own expenses. After discussion regarding ways to support additional student participants, Director Pitts made a motion to offer a \$1000 stipend for registration and partial travel expenses to presenters of the top two TJAS papers (if they attend the AJAS meeting). A similar \$500 stipend would be offered to the top third and fourth TJAS presenters if they are

able to attend the AJAS meeting. Annual Meeting Coordinator Allyn Smith seconded the motion and the motion carried. The importance of tracking the scientific achievements of the TJAS winners was noted.

Visiting Scientist Director—Tony Johnston not in attendance but submitted a report indicating that he had joined the Tennessee Science Teachers Association (TSTA) and attended their meeting in Murfreesboro. He shared a table with the Science Olympiad at the exhibit hall and handed out copies of a Visiting Scientist brochure which he created. The 2017 TSTA conference will be held in November and Director Johnston plans to attend. Director Johnston would like to update the TAS website information on the Visiting Scientist program and include the new brochure.

Annual Meeting Coordinator—J. Allyn Smith reported that he would work on drafting the call for papers for the 2017 meeting to be sent out in the summer. Lipscomb University is under consideration as the location of the 2018 meeting. Treasurer Murphree has a contact at that institution and will inquire and request an official letter of intent from Lipscomb to host the 2018 meeting. Based on the TAS annual meeting location cycle, the 2019 meeting should also be held in the middle region. Treasurer Murphree indicated that he would update the membership database and agreed to supply information regarding the Nashville printer used for the programs. President-elect Mehlhorn will work on obtaining a keynote speaker for the meeting. Past-president Matthews thanked Treasurer Murphree for serving as interim meeting coordinator in 2016, and welcomed with gratitude Smith into the position.

Reports from Representatives

State Department of Education Liaison—It was noted that Kelly Chastain is no longer with the Tennessee Department of Education.

AAAS Section Y Representative—Preston MacDougall reported that the 2018 AAAS meeting is scheduled to be held in Austin, Texas. Under consideration will be changing the name of Section Y.

Reports from Committees

Local Arrangements Committee—Chairperson Sandy Mehlhorn reported that rooms for the meeting have been reserved and the University center would be available. Communications Director Pitts requested information on recommended hotels to include on the TAS website. Mehlhorn will work on obtaining pricing for lunch, and it was noted about approximately \$12 was the cost in recent years. Director Pitts provided suggestions based on experience at the 2016 APSU meeting, and recommended soliciting student volunteers to assist with easel set-up, refreshments, projectors, and delivering student winner names for certificate preparation. He also noted the importance of delegating a student volunteer supervisor. Pitts recommend that student presentations be scheduled first in each technical session so that judging and certificate production could occur prior to the end of that session.

Long Range and Strategic Planning Committee—Chairperson Fred Matthews requested suggestions for President-elect for 2018.

Auditing and Financial Oversight Committee—Treasurer Murphree presented the auditing report on behalf of the Principles of Accounting Class at Belmont University. This informal report describes review of deposits and expenditures, bank statement activity, and the Vanguard balance and dividend activity. Findings indicate that disbursements were clearly supported by invoices or approving emails and that bank accounts appeared properly reconciled except for 11 outstanding checks totaling \$1,423.25. Vanguard dividend income was consistent with dividends on the Vanguard statement.

Publicity Committee—Chairperson Mandy Carter-Lowe reported that on-site certificate preparation for student winners was again a success in 2016. While the Executive Committee had entertained the purchase of a designated printer to use for certificates, Carter-Lowe suggested it would be best to request a printer from the host institution. Storage, transport and ink for a designated printer would be problematic.

Membership Committee—Chairperson Karen Kendall-Fite continues to work to recruit new faculty from state institutions and to provide opportunities for those new members to become involved in the Academy.

Resolutions Committee—Chairperson Preston MacDougall asked for suggestions for resolutions. Director Pitts suggested that a resolution of appreciation be drafted for Belmont University Departments of Biology and Chemistry for their support of the Academy of their science outreach in Tennessee.

Old Business

Executive Committee members discussed needed revisions to several Academy forms and documents including: the abstract submission form (to include a place for a signature of the major professor and the newly added sections), section chair responsibilities, and judging forms for both the poster and oral presentations. Director Pitts and Past-President Matthews agreed to work on revisions to the abstract submission form. Director Pitts agreed to revise the section chair responsibilities. President-Elect Mehlhorn offered to work on revisions to the judging forms for the oral presentations, and Annual Meeting Coordinator Smith will work on the judging form for the poster competition.

After announcements of upcoming events of interested, Past-President Fred Matthews made a motion to adjourn. The motion was seconded by Mandy Carter-Lowe and the meeting was adjourned at 9:37 PM CST.

Respectfully submitted,
Teresa Fulcher
Pellissippi State Community College

Tennessee Academy of Science Executive Committee Meetings 16 November 2017

President Daniel Swartling called the meeting of the Tennessee Academy of Science Executive Committee to order at 7:16 PM CST on the campus of The University of Tennessee

at Martin in room 229 of the Boling University Center. Attendees were President-Elect Sandy Mehlhorn, Past President and Collegiate Division Director Fred Matthews, Treasurer Steve Murphree, Secretary Teresa Fulcher, Managing Editor Rachel Rigsby, Assistant Editor Amy Thompson, Junior Academy of Science Director Preston MacDougall, Visiting Scientist Director Tony Johnston, Annual Meeting Coordinator J. Allyn Smith, Publicity Committee Chairperson Mandy Carter-Lowe, Membership Committee Chairperson Karen Kendall-Fite and Member-at-Large Elizabeth J. Young. Prior to the meeting, the Executive Committee enjoyed a meal. President-elect Sandy Mehlhorn made a motion to approve the minutes from the 21 April 2017 meeting. The motion was seconded by Past President Fred Matthews and approved.

The meeting opened with guest, Dr. Michael Gibson, describing the Reelfoot Lake field trips scheduled for Saturday 18 November 2017. Dr. Gibson announced that a 33-page field trip guide had been developed that was intended to provide written descriptions of selected points of interest for use on a tour of the Greater Reelfoot Ecosystem (GRE). Dr. Gibson proposed that the Academy might be interested in publishing this guide, or otherwise making it available to the membership or public. Dr. Gibson provided copies for the Executive Committee to view, and asked that publication options be considered during the meeting.

Reports from Officers and Directors

Past President—Fred Matthews reported that storage boxes for new easels have been labeled with contact information for easy identification. Matthews reminded committee members that wooden easels are still available for distribution to institutional sustaining members.

President-Elect and 2017 Program Chair—Sandy Mehlhorn reported that she had been working closely with Annual Meeting coordinator Smith and was ready for the upcoming meeting.

Treasurer—Steve Murphree discussed the treasurer's report provided below. Treasurer Murphree noted that the Vanguard Star fund was established in 1992 with funds remaining from the International Science and Engineering Fair hosted that year in Nashville. The funds were transferred to assist the Academy in support of the Junior Academy of Science. Treasurer Murphree reported that the Academy receives dividend checks twice a year. Income has exceeded expenses in 2017, partially due to combining issues of the *Journal* and renewals from institutional sustaining members. Treasurer Murphree indicated that he could provide a more itemized breakdown of income and expenses for anyone interested. Treasurer Murphree reminded members that TAS contributes \$400 for awards to affiliate International Science and Engineering Fair (ISEF) regional fairs in Tennessee. Treasurer Murphree also noted that he was monitoring the yearly income to determine the type of tax return that must be filed on behalf of the Academy. Director Tony Johnston made a motion to accept the treasurer's report. Coordinator Allyn Smith seconded the motion and the motion carried.

TAS Income and Expenses (7/1/2017 through 11/15/17).

Category Description	7/1/2017 through 11/15/17
INCOME	
Annual Meeting Income	15.00
Annual Meeting Lunch	403.00
Annual Meeting Registration	600.00
Membership Dues	6,980.00
Page Charges for Journal	990.00
Unrealized Gain	9,942.03
Vanguard Dividend Payment	1,725.24
TOTAL INCOME	20,655.27
EXPENSES	
Annual Meeting	1,051.59
Dues and Fees	200.00
<i>Journal</i>	64.62
<i>Journal</i> Printing	4,977.14
Junior Academy of Science	444.98
Misc. Expenses	50.00
Treasurer	71.22
TOTAL EXPENSES	6,859.56
OVERALL TOTAL	13,795.72

TAS Balance Sheet (as of 11/15/17).

Account	Balance
ASSETS	
Checking	17,142.72
Star Fund	261,027.15
TOTAL ASSETS	278,169.87
LIABILITIES	0.00
OVERALL TOTAL	278,169.87

Managing Editor—Rachel Rigsby reported that *JTAS* 92:1–2 was published in June 2017 and thanked Assistant Editor Amy Thompson for her assistance. Materials for *JTAS* 92:3–4 are being gathered, and the *Journal* continues to seek manuscript submissions. Managing Editor Rigsby reported that she had received a request from Patrick Randall of the Ernst Mayr Library of Harvard University requesting permission to digitize the *Journal* for inclusion in their Biodiversity Heritage Library (BHL). Executive Committee members asked if our current policy of holding the most recent five years of issues (recent issues are not available on our website in digital form) would be honored. Managing Editor Rigsby agreed to inquire. After discussion, the Executive Committee agreed to table this item until Editor Rigsby could inquire with BHL representatives and Electronic Communication Director Gilbert Pitts could be contacted for comment on this issue. Managing Editor Rigsby reported that work to complete the archival set of *JTAS* issues continues. A list of missing issues will be posted on the website soon. A draft ethics statement will be distributed to Executive Committee members by email for revision and review prior to the April meeting.

Managing Editor Rigsby asked for comment on the proposal to publish the Reelfoot Lake guidebook. Rigsby noted very little of

the cost of the *Journal* is covered by page charges as most publications include TAS business and abstracts from meetings. She indicated that publication of the guide could require an entire issue. The cost of printing color images was discussed as well as a potential review process. After discussion of the Academy's historic role from 1923–1925 to encourage establishment of Reelfoot Lake as a state park, the Academy's opening of the Reelfoot Lake Biological Station in 1932, as well as publication of papers in "Report of the Reelfoot Lake Biological Station" from 1933–1970, the Executive Committee agreed that publication of this field guide was an important project. Secretary Fulcher made a motion that pending document review, the Academy publish the *Reelfoot Lake Greater Ecosystem Fieldtrip* as a special edition in black and white (if color plates are prohibitive), waiving page charges and agreeing to post the field guide in color on the website one year after *Journal* publication. Coordinator Smith seconded the motion and the motion carried. President-elect Mehlhorn also agreed to investigate the process for having additional copies of the field guide available at the field station or state park for sale to the public. Past President Matthews suggested that we also investigate the feasibility of converting the information from the guide into an audio tour.

Collegiate Division—Director Fred Matthews provided statistics on the location and participation of the TAS Collegiate Division meetings from 1994–2017. Director Matthews noted that the 2018 Eastern Division meeting will be held at Mississippi State, and the Middle Division meeting will be at Belmont University. The location of the Western Division meeting is to be determined. Director Matthews reminded the Executive Committee of the TAS funding for the Collegiate Division meetings and that receipts are required for TAS reimbursement for meeting expenses. Director Matthews remarked on the success of certificate onsite printing and is expressing encouragement to Collegiate Division coordinators to use templates provided by Publicity Chair Carter-Lowe to print and distribute certificates on the day of the meeting.

Electronic Communications—Director Gilbert Pitts was not in attendance and no report was submitted.

Junior Academy of Science—Director Preston MacDougall reported that he was recruiting TJAS winners to attend the American Junior Academy of Science (AJAS) meeting in Austin, TX and had three potential attendees. Director MacDougall noted that the Academy supported the attendance of two students to the AJAS meeting in Boston in 2017 and remarked on the powerful experience of the meeting, including having breakfast with four Nobel prize winners. He reminded the Executive Committee that the Academy had approved a stipend of \$1000.00 for the top two recipients and a similar stipend of \$500 for the third and fourth TJAS presenters if they are able to attend the AJAS meeting.

Director MacDougall noted that the winner of the 2017 Distinguished Secondary Science Teacher was Christa Phillips of Houston High School in Germantown, Tennessee. Phillips was recognized at the 2017 Tennessee Science Teachers Association (TSTA) meeting and will be accepting the award at the TAS Annual Business meeting on 17 November 2017. Director MacDougall noted that the TAS award is \$500, while most awards are for \$1000. Director MacDougall made a motion to increase the amount of the Distinguished Secondary Science Teacher award from \$500 to \$750 in 2018 and to \$1000 in 2019 and thereafter. Karen Kendall-Fite seconded the motion and the motion carried. Director MacDougall also announced that the 2017 Tennessee STEAM (Science, Technology,

Engineering, Arts, Math) festival held 90 events across the state with participation from Vanderbilt, The Discovery Center in Murfreesboro, and Oak Ridge National Laboratories. MacDougall wrote a mini grant for the American Chemical Society to be a sponsor for the inaugural year, and suggested that the Academy might be interested in sponsorship for 2018 and agreed to investigate funding levels.

Visiting Scientist—Director Tony Johnston reported that he had attended the TSTA meeting and shared a table with Science Olympiad coordinator David Stanislawski from The University of Tennessee at Chattanooga. Based on that experience, Director Johnston recommends that the Academy be an exhibitor at the next TSTA meeting to provide more opportunities for networking. Director Johnston also recommended that the Academy purchase a table cloth with our logo and print the 1-page trifold Visiting Scientist brochure on cardstock to be placed in attendee registration bags. Director Johnston agreed to send the brochure to the Executive Committee for review prior to printing and President-Elect Mehlhorn suggested Vista Print as a possible vendor for printing the brochure. Secretary Fulcher agreed to provide the TAS logo seal to Johnston. Director Matthews made a motion to authorize Johnston to use TAS funds to purchase a tablecloth and President-elect Mehlhorn seconded the motion. The motion carried.

Annual Meeting Coordinator—J. Allyn Smith reported that the revised judging forms were being tested in both the poster and oral presentation competition, and that he would solicit comments for improvements from section chairs and judges. Coordinator Smith reported that the plenary session for the 2017 meeting is a roundtable discussion regarding the 21 August eclipse. Panelists include presenters from Tennessee Tech, Austin Peay and NASA. Each presenter will have approximately twelve minutes, followed by a question-answer period. Coordinator Smith also indicated that new fill-in-the-blank forms would be distributed to each technical session to report their 2018 chair. Coordinator Smith indicated that the Academy was still waiting on commitment from Lipscomb University to host the 2018 meeting and Tennessee State University was mentioned as a possible host for 2019. It was noted that the host school could elect to hold the meeting on Friday or Saturday.

Reports from Representatives

State Department of Education Liaison—It was noted that Brian Caine is the current coordinator of science with the Tennessee Department of Education and should be invited to participate with the Academy.

AAAS Section Y Representative—Preston MacDougall reported that he would be attending the AAAS meeting in Austin in 2018 and was hoping to take three student winners from the TJAS to present at the AJAS. Registration for Junior Academy attendees is about \$450 but does include food. Representative MacDougall suggested that the Academy might consider encouraging industrial sponsorship to provide more funding for Junior Academy attendees.

Reports from Committees

Local Arrangements Committee—Chairperson Sandy Mehlhorn reported that several student ambassadors would be available to help direct attendees and that technical support

would be available for each afternoon session. She noted that lunch would be available in the University Center Ballroom and coffee service would be available during the poster session on the second floor of the University Center.

Long Ranging and Strategic Planning—Chairperson Fred Matthews presented the following slate of officers for 2018 to the Executive Committee: J. Allyn Smith from Austin Peay State University for President-Elect, Steve Murphree of Belmont University for Treasurer, and Teresa Fulcher of Pellissippi State for Secretary. Mandy Carter-Lowe seconded, and the Executive committee approved presentation of this slate to the full membership at the annual meeting.

Auditing and Financial Oversight Committee—Treasurer Murphree reported on the informal audit conducted by accounting students at Belmont University under the supervision of Dr. Tommy Wooten. Supporting documentation to accompany requests for reimbursement was recommended. Murphree indicated that the Middle Tennessee Science and Engineering Fair account has been separated from the Academy account. Murphree mentioned the success of using Square for registration payment at the 2016 meeting and plans to continue use in 2017 with recommended additional documentation. The need to establish online payment and registration was discussed.

Publicity Committee—Chairperson Mandy Carter-Lowe reported that the public relations department at The University of Tennessee at Martin had done a good job of publicizing the meeting on the college website and beyond. Chairperson Carter-Lowe reported that she had worked with President-elect Mehlhorn to make sure a printer would be on site for production of student certificates. Chairperson Carter-Lowe also indicated that signs would be up encouraging participants to post photos of the meeting using #TAS2017.

Membership Committee—Chairperson Karen Kendall-Fite continues to work to recruit members and plans to use other science organizations as a platform for connecting individual with TAS. Kendall-Fite plans to compile a list of organizations to which she belongs to circulate to the Executive Committee and asks that members add their own affiliations.

Resolutions Committee—Chairperson Preston MacDougall read the text of a proposed resolution of appreciation to Belmont University. Secretary Fulcher made a motion to accept the resolution. President-elect Mehlhorn seconded the motion and the motion carried. The resolution will be read at the annual business meeting and a copy will be presented to Belmont University. Chairperson MacDougall will also present the resolution of appreciation to the host institution at the annual meeting.

New Business

President-Elect Mehlhorn proposed having Academy T-Shirts that could be available to the membership at annual meetings and agreed to explore vendors and options for the Executive Committee.

President Daniel Swartling called for a motion to adjourn and the motion was made by Director Tony Johnston and seconded by Past President Fred Matthews, and the meeting was adjourned at 10:46 PM CST.

Respectfully submitted,

Teresa Fulcher

Secretary, TAS

Pellissippi State Community College