

NEW EDITOR OF THE JOURNAL OF THE TENNESSEE ACADEMY OF SCIENCE



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and Ft. Carson, Colorado. In 1955 he began his undergraduate training at George Peabody College for Teachers where he earned the B.S. degree in mathematics and biology in 1958. In 1960 and 1961 he was awarded two NIH pre-doctoral fellowships at Vanderbilt University and received his Ph.D. degree in 1962 with a major in molecular biology and a minor in biochemistry.

Dr. Tomlinson started his teaching career in the summer of 1959 at George Peabody College and became a full-time faculty member in the fall of 1962. He spent 1963-64 at the Eidgenossische Technische Hochschule in Zurich, Switzerland under the auspices of NIH to study electron microscopy and collaborate on cancer research. After returning to George Peabody College in 1965 he received a NIH grant to set up an electron microscopy laboratory to continue his pursuit of cancer research. In 1966 he became Chairman of the Department of Biology and is presently Chairman of the Division of Science and Mathematics. His teaching responsibilities are primarily in the areas of genetics and physiology. He has served as the Director of two NSF Summer Institutes at George Peabody College for three years and has lectured on regional educational television to secondary schools.

He has contributed to several scientific journals of international distribution and is listed in Leaders in American Science and the Dictionary of International Biographies. He is a member of the Electron Microscopy Society of America, Southeastern Electron Microscopy Society, American Physiology Society, National Science Teachers Association, Sigma Xi, and Tri Beta.

He is married to the former Aileen Bowman and they have two children, Jeffrey, age 12, and Jenifer, age 4. He is an avid spectator and participant in many sports.

PROCEEDINGS OF THE TENNESSEE ACADEMY OF SCIENCE FOR 1969

JAMES D. CAPONETTI, *Secretary*

THE UNIVERSITY OF TENNESSEE, *Knoxville*

EXECUTIVE COMMITTEE MEETINGS

January Meeting, 1969

The Executive Committee Meeting of the Tennessee Academy of Science was called to order by President

Gustave Lundberg at 7:15 p.m. CST in Room 313A of the University Center Building, Austin Peay State University, Clarksville, on January 31, 1969. Members present were Gustave H. Lundberg, President; Roger Rusk, Past-President; James L. Wilson, President-Elect;

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Volume 45, Number 2, April, 1970

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James D. Caponetti, Secretary; Robert L. Wilson, Treasurer; Donald Caplenor, Journal Editor; Richard J. Raridon, Director of the Collegiate Division; John H. Bailey, Director of the Junior Academy; Paul Wishart, Director of the Visiting Scientists Program; William F. Nelson, Director of the Reelfoot Lake Biological Station; Albert L. Myers, Robert L. Amy, and Robert F. Sears.

The Secretary passed out printed copies of the Minutes of the November, 1968, Executive Committee Meeting and the Annual Business Meeting. They were read and approved without correction. Since the Annual Meeting, two new members have joined the Academy making the total membership 825 at this time.

The Past President read a letter that he recently sent to Commissioner Warf.

"Mr. J. H. Warf, Commissioner, Department of Education, 100 Cordell Hull Building, Nashville, Tennessee. Dear Commissioner Warf: It is with grievous spirit that I entreat you to alleviate the plight of the Tennessee Academy of Science.

"During the post war years the Academy, with the help of funds from the National Science Foundation and the selfless work of a number of our members, built up a program of professional services to the science teachers of Tennessee. This program received widespread acceptance by the science teachers in our schools and the hearty support of various people in supervising capacities in the Department of Education. This program was recognized by other state academies of science as one of the best in the nation.

"As sources of Federal funding dried up in recent years, we thought that a service to the people of Tennessee could rightly be funded within Tennessee, and therefore sought financial help through your office and the State legislature. This was the subject of my letter to you of September 20, 1968. The action you took in response to this letter indicated your sympathetic understanding of our financial problem, but as of today, we have not received the financial support which was authorized by the last legislature.

"Specifically, one item in the general education bill provided \$6000 annually for use in the programs of the Academy, including the Reelfoot Lake Biological Station. This item is of many years standing, and we have been regularly receiving the money so appropriated. However, our treasurer, Dr. Robert L. Wilson, reports that we have received only \$3000 of this item during the current fiscal year, 1968-69. A copy of a note from you to Dr. Wilson dated June 10, 1968 refers to a \$3000 warrant as the remainder of the money for fiscal 1967-68. Does this mean we are to wait until June, 1969 to receive the corresponding amount for the current year?

"Our educational services for the academic year 1968-69 have been seriously crippled. Usually, by this time of year, our Visiting Scientist Program is in full swing, but we were unable to even announce it last fall. The program of our collegiate division at our annual meeting in November was seriously curtailed. Our Junior Academy of Science program, which has been one of the best in the country for many years is largely still ahead of us, but the prospect for full participation on the part of students and teachers is not bright. These programs were to have been financed by items in the Miscellaneous Appropriation bill, referred to in my letter of September 20, 1968.

"Any misunderstandings that have occurred regarding the possible duplication of these items is assuredly unfortunate, and we in the Academy can say little else to resolve this difficulty. We will abide with whatever decision is made. However, cannot the \$5500 item, which, I understand, is not in dispute, be acted upon in time for us to make use of funds for the remainder of the school year?

"We need your help. Our program of assistance to school science activities has become known as one of the finest in America, and we have been proud of it. We now feel discouraged and ineffectual. What have we done wrong? What can we do to continue to serve the goals of science education in our schools?

"All of this is a mere trifle compared to the many problems of your office; yet it is vital to the Academy. It affects our essential character as a state academy of science, and determines the extent of our educational activities for the next few years.

"We appreciate very deeply the fine working relationship that has developed over the years between officers of the Academy, and the staff in the Department of Education. It is my sincere wish that the services we have rendered whereby the resources of professional scientists have been made available to science teachers throughout Tennessee may continue to be acceptable.

"The new president of the Tennessee Academy of Science for 1969 is Dr. Gustave Lundberg, Mathematics Department, Austin Peay State University, Clarksville, Tennessee. I have undertaken this last bit of correspondence with you in behalf of the Academy as part of unfinished business for 1968. Please feel free to address either of us in answer to this letter since we will share all such information at our executive committee meeting on January 31.

"With sincere wishes for your continuing good health throughout your most busy life, I am—Respectfully yours, (Signed) Roger Rusk, Immediate Past President."

The Editor submitted the following report:

"Three numbers of Volume 43 have appeared. Edited manuscripts for the October number were given to the printer in early August, 1968, but the proofs have not been received. When complete Volume 43 will have contained 37 articles and reports as follows:

Agricultural Biology	1
Botany	5
Bacteriology	1
Chemistry	3
Engineering	2
Geography	1
Mathematics	2
Physics	3
Zoology	14
Groups of Abstracts	2
Special Reports	2
Proceedings	1
	37

Forty-one manuscripts were reviewed.

"With the advice and consent of the President of the Academy, arrangements have been made to change printers. It is hoped that such change will result in a shorter time lapse between submission of the manuscript and appearance of the Journal. The new arrangement should also result in a savings of some \$200 per quarter as compared to prices of the present printer. The January, 1969, number is now being processed.

"In addition to the manuscripts now in process for number 1 of 1969, 18 manuscripts are now in hand, 16 of which have been provisionally or finally accepted for publication. Two are under review. These are in the following categories:

Agricultural Biology	3
Bacteriology	1
Botany	5
Chemistry	1
Geography	2
Mathematics	2
Zoology	4
	18

"The importance of having a backlog of papers such as this can hardly be overstated. It allows time for thorough review, criticism, and re-writing not otherwise possible.

"As suggested by the Executive Committee in January, 1968, the editor has examined the space requirement for publication of a comprehensive index. It is his belief that such an index can be printed in a single number of 32 pages in the present format plus covers with judicious editing.

"The present editor, believing that the continuation of the *Journal* is necessary for the further development of science in Tennessee, pledges to continue operation of the *Journal*, until an appropriate replacement has been found. Appreciation is expressed to Tennessee Technological University for support in this decision. Nevertheless, the pressure of other commitments demands that replacement not be delayed unduly.

"We have a total of 200 *Journal* issues on subscription or exchange. About 850 issues go to members. Of the 1300 issues printed, therefore, 1050 are mailed out and 250 are saved for future sale."

The Director of the Reelfoot Lake Biological Station reported that work was progressing to set up a program at the station for next summer. At the moment facilities are adequate for limited teaching. Limnology and herpetology will be offered. An arrangement has been worked out with a local motel owner to house the students. In exchange for repairing and painting the motel facilities by the students, the Owner has agreed to lease the motel to the UT Martin Biology Department for a nominal fee for five years. The Director's report was approved.

The Director of the Junior Academy reiterated what he had said during the annual meeting, i.e. about \$5,000.00 is needed to carry on the Junior Academy program for 1968-69. He was happy to announce that a few days ago he received a letter from the NSF stating that a grant of \$2,000.00 is awarded to the Academy for support of the Junior Academy Program. If \$3,000.00 could now be provided by the Senior Academy, the program would be in good shape. The Director's report was approved.

The Director of the Collegiate Division had no formal report but announced that the \$300.00 left over in the Division budget would barely be enough to carry the program for this spring. If he could have \$300.00 more, it would allow \$200.00 for each of the three meetings in the spring.

The Director of the Visiting Scientists Program had no report except to say that visits will resume when money becomes available. He also reported that a few scientists in the state have made visitations and paid their own expenses.

The Director of Science Talent Search was absent from the meeting.

The Treasurer reported that the Academy's operating account had a balance of \$2,429.70 available January 1, 1968. Total receipts were \$8,112.95, making the total cash available \$10,542.65. Total disbursements were \$5,311.96, leaving a balance of \$5,230.69 available January 1, 1969. The balance for the Reelfoot Lake Biological Station account is \$1,586.83 and that of the Visiting Scientists Program is \$819.79. Complete figures are published elsewhere in this *Journal* under the Treasurer's Report.

The Treasurer's books have been audited.

"January 16, 1969, Report of the Auditor, To the Tennessee Academy of Science: I have examined the Treasurer's Report of cash receipts and disbursements,

operations account, and Reelfoot Lake Biological Station, Tennessee Academy of Science for the period, January 1, 1968 to December 31, 1968. In my opinion, on the basis of information made available to me, the statements fairly present the transaction of these accounts. Signed: Rayford J. McLaurin, Auditor, Chattanooga, Tennessee."

After consultation with the Treasurer, it was moved, seconded, and passed to appropriate up to \$300.00 from the Operating Account balance to the Director of the Collegiate Division so that he could have \$600.00 for the three Division meetings this spring.

The following is a report submitted by Dr. Richard J. Raridon who, as our AAAS representative, attended both the Academy Conference Meeting and the AAAS Council Meeting held in conjunction with the AAAS meetings in Dallas, Texas, December 26-31, 1968.

Report by Richard J. Raridon on the Academy Conference held at the AAAS Meeting in Dallas, Texas, on December 27, 1968.

"The Academy Conference composed of representatives from state and city Academies of Science, held two half-day sessions and an evening banquet on December 27, 1968. The morning session convened with Dr. G. Gerald Acker, Bowling Green State University, discussing the financing of state academies. From a survey he made of 34 Academies, the following data were presented: Amount spent yearly for administrative costs (salaries, supplies, secretarial, etc.)

Amount	No. of Academies
less than \$5000	10
\$ 5,000 - 10,000	10
\$10,000 - 20,000	6
\$20,000 - 50,000	5
greater than \$50,000	3

Sources of income:	11 receive government aid
	13 receive state funds (9 receive direct appropriations)
	19 get more than 50% of their funds from dues
	18 have endowment income
Visiting Scientist Program—Effect of NSF cut-off	8 quit
	17 reduced
	8 continued with other funds
1967 Budget balance:	14 in black
	18 in red

"Dr. Acker then made the following recommendations for fiscal planning by academies:

- Incorporate!
- Obtain tax exempt status (and emphasize this clearly when asking for funds)
- Have strict budget control (each voucher should be signed by director of that particular program)
- Have paid executive officer, even though salary may be small
- State funds should carry no ties on administration
- Have someone to coordinate fund raising
- personal contact best
- court affluent professions
- match project to source when asking for funds
- hit Rotary, Kiwanis, etc., such as asking them to sponsor local students to meetings
- keep record of persons and companies approached
- sustaining memberships should probably not exceed \$100 (Ohio gets \$7,500 from this source)
- since to have certificates for special members, possibly each year

"The afternoon session convened with Dr. Charles M. Vaughn, Miami University, Oxford, Ohio, discussing Collegiate Academies and Related Undergraduate Science Activities. Dr. Vaughn sent questionnaires to the 45

Academies listed in 1966 asking whether they had collegiate activities and, if so, how they functioned. He received 35 replies of which 24 were positive, including 10 of the 11 functioning collegiate academies listed in the 1967 Proceedings of the Academy Conference. The presently active collegiate academies are in Ark., La., Minn., Mo., Nebr., N.C., Ohio, Okla., S.D., Tenn., and Texas. Other academies carry out some activities designed for college students. Several have reduced dues and some allow students to present papers at annual meetings. Some present awards for research and for outstanding papers presented by students. Some state journals accept student papers.

"Among the active collegiate academies, the activities are fairly similar to those carried out in Tennessee. Some have collegiate chapters. One state, Tex., has a collegiate journal which is supported by student dues. Dr. Vaughn presented data on NSF support for the past three years, as follows:

NSF Support of Collegiate Activities	FY 65 FY 66 FY 67		
	Joint Board on Science Ed. (Maryland)	900	750
Ohio Academy	3,500	4,095	2,320
Oklahoma Academy	1,730	2,780	1,850
South Dakota Academy	2,050	2,105	1,330
Tennessee Academy	4,200	4,670	2,250
Texas Academy	-0-	3,735	2,315
Totals	12,380	18,155	10,800

It is interesting to note that not only was Tennessee one of the few academies funded, but that our share for the 3 years was larger than any other state.

"Dr. Vaughn concluded his presentation as follows . . . 'It is apparent that we are swiftly approaching a point where 50% of a given age group will enter college and half of them will graduate from college four years later. The time of career decision has moved into the college years, increasing the importance of college professors, courses of study, and fellow students influencing such major decisions.

'We see continuing pressures for increasing the number of community colleges, two year and four year alike, the number of professional schools and an ever increasing graduate school population.

'State Academies are vaguely aware of their responsibilities to this population but have not set out to meet the several challenges found in these conditions.

'Academies of Science should interact as coequals with colleges and universities in their states. Together, Visiting Scientist Programs can be established so that community colleges (Jr. and 4 year) and colleges granting only baccalaureate degrees can have research scientists speak and illustrate their work.

'Students working on independent research problems should be encouraged and supervised by academy members. Students can participate in science fairs, junior academy activities as well as science club seminars in college departments. The survey shows that if a state has an active Collegiate Academy there is an active group of Senior Academy members guiding and directing its continuing growth and health. Such interest and dedication can be directed in all Academies to the solving of these several problems of leadership, guidance, direction, cooperative activities in research and lecture series for the college youth of today who will be Tomorrow's Leaders . . .

"Sister Joseph Marie Armer and Dr. J. Teague Self then presented brief descriptions of the Texas and Oklahoma collegiate academies, respectively. This was followed by discussion in which someone suggested that a dean from a graduate school might effectively speak to a collegiate group on the subject of transition from undergraduate to graduate school.

"It was announced that the Academy Conference has asked that its name be changed to Association of Academies of Science, which is more indicative of its

actual function. This change has been approved by the AAAS Council."

Report by Richard J. Raridon on the AAAS Council Meeting held in Dallas, Texas, December 30, 1968.

"The AAAS Council convened at 9 AM on Dec. 30, 1968, with about 300 people present. Admission cards were required and only authorized representatives of AAAS affiliated societies were permitted to attend. It was mentioned that the criteria for affiliation is under study and it may become a policy to withdraw affiliation from societies who are consistently not represented at Council meetings. A full day of committee reports and other business followed. The Council voted to drop the \$10 assessment for each affiliated society representative to the Council, and to grant affiliation to the Animal Behavior Society and the Marine Technology Society. There was discussion of reorganization of the Council, to balance it better with respect to distribution among the fields of science represented in AAAS membership. There was considerable discussion, by such people as Margaret Mead, Barry Commoner, Bentley Glass, and others, on the statement adopted by the Board of Directors proposing a field study on the use of herbicides in wartime and peacetime. After 90 minutes of debate, the Council voted to recommend that any reference to Vietnam in the statement be omitted."

OTHER BUSINESS

1. For the AAAS Meeting next December in Boston, Massachusetts, it was moved, seconded, and passed that Dr. Clinton L. Baker be appointed representative to the Academy Conference Meeting, and that Dr. James D. Caponetti be appointed the delegate to the AAAS Council Meeting.

2. The Secretary reported that he received a letter from Dr. William T. Kabisch, Assistant Executive Officer of the AAAS stating that by vote of their Council, the Association has decided to abandon the requirement that each affiliate pay an assessment of \$10.00 a year for each of the affiliate's representatives in Council, and at the same time to cease the subscription to *Science* to the affiliate in exchange for each assessment. The Secretary also read a letter from Dr. Hans Nussbaum, Business Manager of the AAAS reiterating the Council vote to eliminate the affiliate assessment and extending an invitation to our Academy to join AAAS and receive *Science* on a regular basis. A motion to join the AAAS in the Academy name was seconded, but was defeated.

3. The Secretary read a letter from the President of the Tennessee Citizens for Wilderness Planning wherein there is a request that the Academy endorse the purposes and objectives of that organization. Since the Executive Committee of the Academy alone is not empowered to endorse the aims of any organization, it was moved, seconded and passed that an ad hoc committee be appointed to draft a general statement on conservation and preservation policy which would be presented to the membership at the next annual meeting for a vote. President Lundberg appointed the following ad hoc committee: A Paul Wishart, Chairman; Albert L. Myers; and James D. Caponetti. The Executive Committee felt that a general statement on conservation and preservation, if voted in the affirmative, could be referred to or quoted by those organizations whose purposes and objectives of conservation and/or preserva-

tion of natural resources coincide with those of the Academy.

4. The *Secretary* read two letters of invitation for the site of the next annual meeting of the Academy. One was from Dr. H. Malcolm Owen, Chairman of the South, Biology Department, The University of the South, Sewanee, and the other from Dr. C. C. Humphreys, President of Memphis State University, Memphis. After careful deliberation, it was moved, seconded, and passed that the site of the 1969 annual meeting be The University of the South, November 21 and 22. A motion was also introduced that the *Secretary* include a request for written invitations for the 1970 annual meeting site in his annual (October) letter to the membership. In this way the 1970 annual meeting site could be decided at the 1969 annual meeting. The motion was seconded and passed.

5. A motion was introduced that the President appoint an ad hoc committee which would propose necessary amendments to the constitution of the Academy. President Lundberg appointed the following ad hoc committee: James L. Wilson, Chairman; Roger Rusk; and James D. Caponetti. The President would then include the proposed amendments in his next annual (October) letter to the membership, and they would be voted on at the next annual business meeting. The motion was seconded and passed.

6. During the January, 1968, Executive Committee Meeting, Roger Rusk and James D. Caponetti were appointed as an ad hoc committee to prepare a brochure to promote the Academy and stimulate membership. The committee noted afterwards that this could not be done effectively because the Academy was not incorporated. Past-President Roger Rusk announced that the Academy is now officially incorporated as of December 18, 1968. The official papers of incorporation were vested with the *Secretary*, and his address is the official address of the Academy Corporation. Since the Academy is now officially incorporated, President Lundberg appointed an ad hoc committee to draft a brochure which would promote the Academy and stimulate broader categories of membership. The committee consists of Roger Rusk, Chairman; Richard J. Raridon; and James D. Caponetti.

7. It was moved, seconded, and passed to appropriate \$300.00 from the balance of the Visiting Scientists Program budget to the Junior Academy unless money is received from the State Department of Education.

The meeting was adjourned at 11:35 p.m. CST.

November Meeting, 1969

The Executive Committee meeting of the Tennessee Academy of Science was called to order by President Gustave Lundberg at 8:15 A.M. C.S.T. in Room 1 of the Sewanee Inn in Sewanee, Tennessee, on November 21, 1969. Members present were Gustave H. Lundberg, President; James L. Wilson, President-Elect; James D. Caponetti, Secretary; Robert L. Wilson, Treasurer; William F. Nelson, Director of the Reelfoot Biological Station; Richard J. Raridon, Director of the Collegiate Division; John H. Bailey, Director of the Junior Academy; A. Paul Wishart, Director of the Visiting Scientists

Program; Robert F. Sears, Albert L. Myers, and Robert L. Amy, Members-at-large.

The *Secretary* passed out printed copies of the Minutes of the January Executive Committee meeting. They were read, one correction made, and then approved. The *Secretary* reported that from the start of 1969 to this moment, there were 34 new membership applications. One drop and seven deaths were reported to the *Secretary*. Total membership is now 883. A motion was seconded and passed to accept the 34 applicants into membership in the Academy.

The *Treasurer* submitted his report. As of January 1, the bank balance was \$5,153.69. Income which was mostly from appropriations by the Tennessee State Department of Education amounted to \$21,079.20. Expenditures were \$8,966.83, leaving a balance of \$17,266.06 as of November 1, 1969. The *Treasurer* stated that he will present a fiscal year report at the January Executive Committee meeting. The members of the Auditing Committee sent a written report to President Lundberg in the form of a letter.

"As the members of the 1969 Auditing Committee of the Tennessee Academy of Science, we have examined the records of the *Treasurer* and have found them to be accurate and in order. A copy of the *Treasurer's* report for the first part of 1969 is attached. The complete report will be filed with the Academy records at the end of the year. As in former years, a final audit of the *Treasurer's* records will be prepared at the end of the year by a Certified Public Accountant. A copy of the final report will be supplied to the Editor of the *JOURNAL* for publication. Signed by Winston L. Massey and Myron S. McCay."

A motion was passed accepting the reports of the *Treasurer* and the Auditing Committee.

The *Editor* was absent from the meeting, but he had sent a written report to the President who read it to the Committee.

"The final number of the *Journal* for 1969 (Volume XLIV) is now being printed and will be ready for mailing within a few days. A summary of the contents of Volume XLVI follows: Abstracts, Group of — 3; Botany — 7; Chemistry — 1; Geography — 1; Index — 1; Mathematics — 1; Proceedings — 1; Reports — 2; Zoology — 11.

"Manuscripts are now on hand and accepted to complete, approximately, the XLV Volume for 1970. If the present rate of submission of manuscripts continues, someone in the Academy must make some hard decisions. Either the *Journal* must be enlarged, or there must be a tougher editorial policy, or both. Some space could be saved if the Proceedings were printed separately or drastically shortened. Enlargement could be effected by a per printed page charge of about \$20. Such a procedure would probably also have the effect of diminishing submission of manuscripts.

"Another matter that needs examination is the matter of advertising space. The present editor has dropped all quarter-page advertising because the rate of advertising which we had established would not pay for the trouble and expense of setting up printing and collecting.

"Another thing that needs serious consideration is the matter of a cumulative index. The present editor suggests that while most of the existing numbers are on file, it appears that it would be highly valuable to prepare and print a cumulative index from the beginning of the existence of the *Journal* through 1969.

"These problems already enumerated and others which do not present themselves at the moment prompt the present editor to encourage the Executive Committee to establish an Editorial Board which will oversee policy decisions for the continuation of the *Journal* operations,

and to recommend policy change to the Executive Committee. I do not believe that the editor is able or willing to make all the decisions necessary and I do not believe that the Executive Committee has the time or inclination to do so.

"During the course of the year it has been necessary to change printers. The *Journal* is now being printed by Curley Company, 411 Cowan Street, Nashville, Tennessee 37207, in a satisfactory manner and at a cost more reasonable to the Academy.

"It is my understanding that a new editor for the *Journal* has been secured and has accepted the position. My personal knowledge of Dr. Tomlinson allows me to feel very secure about the future operation of the *Journal*. He is a good man and will do an excellent job. Dr. Tomlinson and I are now working together for the preparation for the first number of 1970.

"Finally, I wish to thank the Executive Committee, the section editors, and the membership of the Tennessee Academy of Science for allowing me the privilege to serve as editor for four years. Cooperation of all interested people has been outstanding."

A motion was passed to accept the Editor's report. The recommendations made by the Editor in his report were then discussed. It was agreed that the format of the *Journal*, the matter of advertising, and the publication of a cumulative index were topics which needed much discussion and were thus relegated to the January Executive Committee meeting. A motion was seconded and passed to appoint Dr. Gus Tomlinson the new Editor of the *Journal*. Another motion was seconded and passed to allow the new Editor and the President to appoint an Editorial Board whose members would be sought from the middle Tennessee area so that they could conveniently meet with the Editor in or near Nashville since Dr. Tomlinson is a faculty member of George Peabody College.

The *Director of the Collegiate Division* submitted the following short report:

"The Collegiate Division held three regional meetings during Spring 1969, at Carson-Newman College, The University of the South, and Siena College. A total of 35 papers were presented by students representing 15 schools. Many students submitted abstracts which will be published in the *Journal*. Signed Richard J. Raridon, State Sponsor, TAS-CD."

A motion was passed to accept the *Director's* report. The *Director* then presented a proposed budget for 1969-70 in the amount of \$2,000.00. A motion was passed approving the requested budget.

The *Director of the Junior Academy* submitted his written report as follows:

"Pursuant to the encouragement and guidance of the Officers and Directors of the Tennessee Academy of Science, the 1968-69 program started in the winter of 1967 by an application to the National Science Foundation for funding. I was advised of delays to be expected in approval of funds due to the impending economy move by a new national administration. I was advised not to anticipate any funds in excess of \$2,000.00, the maximum to be granted to any of the various state junior academies.

"Shortly after the opening of the 1968-69 school year in the Tennessee public and private high schools in Tennessee notices of the program of the TJAS were in the mail. This mail described the rules and regulations for submission of papers to the TJAS. The mailing list was procured from the AAAS master list of Tennessee high school mathematics and science teachers compiled under a NSF grant. It included a list of approximately 3,200 names. Following many starts a total of 125 papers

were completed and entered for final judging. The quality of the research papers submitted indicated a high quality of research and paper preparation. The high school science and mathematics teachers are to be commended.

"A local committee from the East Tennessee State University Science and Mathematics Departments screened the papers and recommended a total of twenty-five high school students, together with their teachers to be invited to the state Junior Academy of Science meeting at Vanderbilt University in April.

"Dr. Holladay, Chairman of the Physics and Astronomy Department and his staff, as usual, served the part as perfect hosts for this meeting. The participants did themselves well and the teachers and/or parent sponsors were pleased at the quality of work their high school students produced.

"The year's activities were culminated with the publication and mailing of the 1969 TJAS Handbook of Proceedings and Transaction in October. Copies of the proceedings were mailed to the participants and to selected high school superintendents and principals.

"Finances for the 1968-69 program were approved by the NSF at a late date (January 1969) and the Tennessee Department of Education during the spring of 1969.

"The budget submitted to the Tennessee Academy and the NSF last January are attached."

A motion was passed to accept the *Director's* report. In his proposed budget for 1969-70, the *Director* requested a total of \$5,755.00 of which \$2,000.00 is anticipated from the National Science Foundation, and the balance of \$3,755.00 be supplemented by the Academy. A motion was seconded and passed approving that the latter figure be made available to the *Director* for effective operation of the Junior Academy.

The *Director of the Visiting Scientists Program* submitted the following written report:

"The Visiting Scientist Program was activated again for the academic year of 1969-70 as a result of the release of funds by the state legislature.

"The proposed program for the current year is designed to provide for approximately 100 visits to secondary schools of the state.

"Roster: Scientists who had previously served in this program were contacted last spring and summer relative to their interest in participation in the current program. The greater majority of those contacted were favorable to continuing their service in 1969-70. A number of new scientists were added to the current Roster in order to strengthen selected subject matter areas and geographic areas which needed special attention.

"Initiation of Program: Commissioner J. Howard Warf of the State Department of Education, Mr. Joe Minor, and other staff members in the Department of Curriculum and Instruction have closely cooperated in the development of the current program. Commissioner Warf sent a letter to all superintendents of the school districts in the state informing them of the program provisions and encouraging their cooperation in carrying out the Visiting Scientist Program.

"Publicity: After all school districts had been contacted, a roster and letter directed to the school principal in each of the 465 high schools was mailed with a special request that the Roster be directed to the attention of the science department."

A motion was passed to accept the *Director's* report. The *Director* requested a budget of \$5,500.00 for 1969-70 and a motion was passed approving it. The following is the publicity letter which the *Director* sent to each of 465 high schools in the state:

"Dear Science Teacher: I am sure that you are aware of the financial difficulty experienced by the Tennessee Academy of Science as it has endeavored to carry out the many phases of its educational programs, including the Tennessee Visiting Program. Many educators and

other friends of Tennessee Education tried without adequate success to obtain the release of funds which had been allocated by the Tennessee legislature for support of the Visiting Scientist Program during the current academic year, 1968-69. These efforts, extending over many months, were obviously not successful; therefore causing a curtailment of most of the Visiting Scientist Program for this academic year.

"I have been in contact with officers of the Academy who are continuing their concentrated efforts to obtain financing through legislative acts for the year 1969-70. At this time we are considerably assured of success in the prospects, although complete assurance of success is lacking. I am very sorry that we have been unable to work at full schedule with you during the present year, but I hope that we will again be in business next year. Please rest assured that we will initiate operations at the earliest opportunity. I wish you a successful and happy year of teaching. Signed: A Paul Wishart, Director."

Since the time of the General Session was approaching, a motion was passed at 9:45 A.M. C.S.T. to recess the Executive Committee meeting until after lunch.

The meeting was resumed at 2:10 P.M. C.S.T. in Room 1 of the Sewanee Inn in Sewanee, Tennessee.

The Director of the Science Talent Search Committee, Mr. James T. Davis, was absent from the meeting. President Lundberg read a letter which Mr. Davis had sent to him last July.

"July 31, 1969; Dr. G. H. Lundberg, President, TAS, Austin Peay State University, Clarksville, Tennessee 37040. Dear Dr. Lundberg: Thank you for your kind letter dated July 21, in which you requested information concerning the progress of the Science Talent Search.

"I should like to itemize some of the activities now in progress which are related to the Science Talent Search. A newsletter from the State Dept. (science section) is being prepared which will be sent to all science teachers across the state encouraging their participation in the Science Talent Search. Each science organization such as Northeast Science Education Association and science sections from ETEA, TEA, and West Tennessee are being encouraged to participate. Dr. Paul Wishart from U.T. invites the Tennessee Science Talent Search winners to participate in the Science and Humanities Symposium each spring and this schedule is being studied. Names of last year's winners have been sent to many colleges and universities for scholarship consideration.

"At the present time I am in need of funds for stationery and other items such as certificates and metal pins to present to our participating students. How do I go about securing funds?"

"May I say that I shall be most happy to do anything I can toward helping develop the plans for the annual meeting of TAS on November 21 and 22, at The University of the South. I shall look forward to seeing you in November. Signed: James T. Davis, Assistant Director, Kingsport University Center."

President Lundberg then submitted his report which follows:

"In this summary of some of the activities of the Academy, I shall attempt to repeat as little as possible what has already been given in the reports by officers and committee chairmen.

"In the statement of the Proposed Amendments to the Constitution, mailed some time ago by James L. Wilson and his committee, it was noted that the Academy is now incorporated. The official date of incorporation was December 18, 1968. For this change in organization we are indebted to Past President Roger Rusk. It is hoped that since the Academy is incorporated as a non-profit organization, it may secure financial support from business and industry because of the tax advantage. Formerly

the Academy was not recognized by the Internal Revenue Service as an organization providing tax advantage to donors.

"Federal money is no longer available in large sums and threatens to be completely withdrawn. We were fortunate to be one of the few Academies to receive aid this year. Through the efforts of John H. Bailey, \$2,000 was granted for the Junior Academy Program. Without financial assistance from the State, the Academy programs could not exist. Three years ago, through the efforts of Mel Mayfield, action was taken to secure additional state funds. Senator Halbert Harvill of Clarksville, in consultation with Commissioner of Education J. Howard Warf, introduced legislation which resulted in the appropriation of \$11,500, \$3,000 of which was designated for support of the Reelfoot Lake Biological Station. A like amount has been requested each of the following years and Senator Harvill, Commissioner Warf and Representative Frank Runyon of Clarksville have supported the Academy request and funds have been appropriated. We are most grateful for this support.

"Dr. Don Caplenor of Tennessee Technological University, who has been Editor of the Journal for the past several years, has asked that he be replaced. His fine work as Editor brought him special recognition this year when the Journal was selected for coverage in the Science Citation Index, which brings the Journal to the attention of a wide audience.

"Dr. Gus Tomlinson of George Peabody College is Dr. Caplenor's successor. He is a former colleague of Dr. Caplenor and is well prepared to assume the responsibility of his new office.

"Dr. Robert Sears of the Physics Department, Austin Peay State University, was appointed to a three-year term on the Executive Committee to succeed Dr. William Ellis, Dean of Faculties at Austin Peay State University, whose term expired in January.

"Dr. William F. Nelson, Professor of Biology at the University of Tennessee at Martin, assumed office in January as Director of Reelfoot Lake Biological Station. He succeeds Dr. C. L. Baker, who directed the Station for many years. Dr. Nelson's report indicated continued opportunity for research at the Station.

"The schools in Tennessee are increasingly aware of the educational services of the Academy as is evidenced by their increased participation in its programs. The directors of the various programs, A. Paul Wishart, Director of the Visiting Scientist Program; James Davis, Director of the Science Talent Search; John Bailey, Director of the Junior Academy; and Richard Raridon, Director of the Collegiate Division, are to be commended for their contribution to science education in Tennessee. We wish also to express our appreciation to members of the State Department of Education, Don Wood, Joe Minor, John Ed Cox, and others for their loyal support.

"The geographers of the State requested the privilege of forming a separate section for their group. The request was granted at the November meeting of the Executive Committee.

"This year, for the first time, the Tennessee State Science Conference is held in conjunction with the annual meeting of the Academy. The Academy is pleased to welcome them.

"It has been a privilege to serve as President of the Academy, and I appreciate the opportunity given me to do so. I want to thank the Academy membership for its cooperation. Without the advice and help of my associates, it would have been impossible to have performed the functions of the office. I express my best wishes to the new president and to the Academy."

A motion was passed to approve the President's report. The Director of the Reelfoot Lake Biological Station submitted the following report:

"In the summer of 1969, accredited college courses were offered for the first time at Reelfoot Lake. Courses in Herpetology and Limnology ran consecutively for

three weeks each. It was felt that three weeks of each course would permit the class to meet at any and all hours without concern over early rising to meet another class the next morning. Night collecting trips were a regular part of the Herpetology course. This arrangement also permitted closer correlation of lectures and labs than would be possible with both courses running concurrently. While it requires constant and intense study to cover the material in so short a time, the students were favorable to the arrangement. The three week courses also facilitates finding instructors for these summer courses. The Herpetology course was taught by myself and Dr. Clay Chandler of Bethel College taught the Limnology.

"Funding of the project was approved too late to get any advance publicity, but seven students were enrolled in Herpetology and five of them continued through Limnology. Most of the students were from The University of Tennessee at Martin, but Middle Tennessee State University and Bethel College were also represented. Only male students were considered because of a lack of segregated housing.

"Students were housed in the old Raintree Motel, hereafter referred to as the "dormitory." Meals were contracted for at Williams' Place, a local restaurant. The Biological Station was used as a lecture room and laboratory for most of the herpetology course, but since it is a thirty mile round trip from the dormitory to the station, it was used less and less. The Limnology course was taught entirely at the dormitory and the auditorium at the local museum. The location of the station in the middle of a Federal Wildlife Refuge also limited its usefulness to some extent. Federal collecting permits were obtained for reptiles and amphibians, but restrictions on numbers and kinds to be collected made the immediate area less suitable for collecting than other parts of the lake.

"Two students began research projects in herpetology, which, if continued by other individuals over a period of time, could prove quite valuable.

"Student reaction to the courses was highly favorable, and most of them indicated a desire to take more courses at the lake, despite the extreme discomfort caused by the excessive heat of last summer. Work is progressing in lining up courses for next summer.

"Other than the course work, the station was quiet, except for the usual vandalism. Requests have come in regarding possible use for next summer, however."

A motion was passed to accept the Director's report. In response to several requests by several conservation organizations, the President had appointed an ad hoc committee and charged the members to prepare a statement on conservation and preservation policy. The chairman of the committee, Dr. A. Paul Wishart, presented the following written report:

"In accordance with a directive by the Executive Committee of the Tennessee Academy of Science on January 31, 1969, that an ad hoc committee be formed to prepare a statement on Conservation for action by the Tennessee Academy of Science, the following committee was duly appointed: James D. Caponetti, Department of Botany, The University of Tennessee, Knoxville; Albert L. Myers, Department of Chemistry, Carson Newman College, Jefferson City; A. Paul Wishart, Chairman, Department of Curriculum and Instruction (Science Education Area), The University of Tennessee, Knoxville. The Committee proposes the following:

I. Assumptions:

- A. Conservation principles, practices, problems, and policies influence the lives of virtually all citizens, regardless of station of life or area of residence.
- B. Improved education to promote an understanding of conservation principles, practices, problems, and policies and their many implications is urgently needed in order to effect needed improvements in

the broad areas of conservation and environmental education.

- II. Conservation Principles—Basic conservation principles include:
 - A. Natural resources exist for the ultimate benefit of all citizens.
 - B. Wise resource use considers the welfare and best interests of the present and future generations of citizens.
 - C. Man is dependent upon natural resources for his existence and must realize that he is a part of the natural environment and not the master of it.

- III. Conservation Practices—Exemplary and highly exploitive practices are found in present-day society.

- A. Selected examples of exemplary practices include:
 1. Efforts by local, state, and federal governmental agencies, including, among many others, such things as the establishment of parks, wildlife sanctuaries, and forest areas, the passage of laws aimed at reducing or eliminating pollution, and providing professional assistance in good conservation practice.
 2. Efforts by private groups and foundations which traditionally have had a catalytic effect on government and industry.
 3. Efforts by industry which reflect public interest and in many cases long range self interest.
- B. Selected examples of highly exploitive practices include:
 1. Rapid and excessive withdrawal of ground water from aquifers in many regions of the country.
 2. Removal of vast acreages of forests without adequate reforestation.
 3. Denudation of large areas of the U.S. by strip mining without adequate restoration of the affected areas.
 4. Infringements on and destruction of certain wilderness areas.
 5. Pollution of land, water, and atmosphere.
 6. Widespread disregard for aesthetics in the areas of the public domain (i.e., highway billboards and urban developments).

IV. Conservation Problems

- A. The uncontrolled increase in the number of people places a heavy demand on natural resources with no concomitant plans for either replacement of the replaceable natural resources or judicious use of the irreplaceable ones.
- B. The improper zoning of residential and commercial areas leads to infringements on wilderness tracts and loss of open areas in and around cities. These tracts and areas could be lost for all time as areas of recreation.
- C. Lack of the proper processing of human and industrial effluents leads to damaging pollution of land, water, and atmosphere.
- D. The unsolved problems of conservation will have ultimate legal implications and complications, which tend to perpetuate and accentuate certain of these problems. In some instances, the damage done may be irreparable.

V. Conservation Policies

- A. It is the duty of individual citizens to take an active role in conservation:
 1. To encourage citizens to recognize the fatal hazard of unrestricted population growth.
 2. To achieve a realistic balance between the use of and the replacement of those natural resources which can be replaced.
 3. To plan for the prudent utilization of natural resources which are irreplaceable.
 4. To preserve certain wilderness and other selected areas for the permanent enjoyment of all citizens.
 5. To prevent the damaging pollution of land, water, and atmosphere.
 6. To support the establishment or strengthening of governmental bodies (agencies) at the local,

state, and federal levels whose specific function is to institute effective legal measures which will enforce conservation and/or preservation policies.

7. To promote a dynamic and articulated program of conservation education in all levels of the educational system.

B. The Tennessee Academy of Science endorses the aims and policies of those organizations whose primary objectives relating to conservation and/or preservation are in agreement with those of the Academy."

A motion was passed to accept the report and to present it to the membership at the annual business meeting for approval.

Since the Academy is now incorporated, amendments to the *Constitution* become necessary. The President had appointed an ad hoc committee charged with proposing the necessary amendments in relation to incorporation plus any others which would improve the activities of the several educational programs. The chairman of the committee, Dr. James L. Wilson, presented the following written report:

"Inasmuch as the Tennessee Academy is now an Incorporation, certain specific amendments to our Constitution are recommended for your consideration and will be acted upon at the annual business meeting on November 21, 1969.

To replace Article I, Section I: Article I, Section I. The name of this organization shall be the Tennessee Academy of Science, Incorporated.

To replace Article IV, Section I, first sentence: Article IV, Section I. The officers of the Academy, the immediate past president, the directors and sponsors of each of the educational programs of the Academy, and three members at large shall constitute the Executive Committee of the Tennessee Academy of Science, Incorporated.

To replace Article IV, Section 4: Article IV, Section 4. The Executive Committee shall constitute the Board of Trustees of the Corporation. Any meeting of the Executive Committee shall be regarded as a meeting of the Trustees of the Corporation.

Add to Article III, Section 4: Article III, Section 4. The address of the Secretary shall be the permanent address of the Academy.

The changes in the Constitution, which were mailed out with the annual letter to all members, deal mainly with changes needed due to incorporation and changes in the composition of the Executive Committee.

A correction is noted in the proposed change as stated for Article IV, Section 1. This should read: To replace the first sentence of Article IV, Section 1. The rest of Article IV, Section 1 should remain as stated.

The actual change in Article IV, Section I is a replacement of a portion of the sentence dealing with the Sponsors of various programs. In looking at the current or last printing of the Constitution (July, 1960), it is noted that the portion being changed is not in the printed Constitution. The April, 1961 issue of the Journal, page 123, which is a portion of the minutes of the January 29, 1960 Executive Committee Meeting, reads: 'A motion was made, seconded, and passed that it be recommended to members of the Academy at the

1960 Annual Business Meeting that the first sentence of Article IV, Section 1 of the Constitution be amended to read as follows: 'The officers of the Academy, the immediate past president, the sponsors of the Junior Academy and the Collegiate Division, and three other members shall constitute the Executive Committee of the Tennessee Academy of Science.' The change became effective when the minutes of that meeting were approved at the Annual Business Meeting. The actual change is a replacement of: 'the sponsors of the Junior Academy and the Collegiate Division,' with 'the directors and sponsors of each of the educational programs of the Academy.' At the present time, this will add only one member to the Executive Committee, i.e. the Director of the Visiting Scientist Program.

Ad hoc Committee on Revision of the Constitution, appointed by the Executive Committee: James L. Wilson, Chairman; James Caponetti; Roger Rusk."

A motion was passed to accept the report and to present it to the membership at the annual business meeting for approval.

The Academy is ever expanding its educational programs. More money is needed not only to support such programs but also to compensate for ever increasing operational costs. In response to this situation, the President had appointed an ad hoc committee charged with drafting a brochure of some sort which would promote the Academy and stimulate broader categories of membership, especially from the industries of the state. Now that the Academy is incorporated, industrial companies could tax deduct their contributions. One of the members of the committee, Dr. James D. Caponetti, acting as spokesman for the chairman, Professor Roger Rusk, reported that as the committee took on the task of preparing a brochure several questions and problems arose for which answers and advice were needed from the Executive Committee before proceeding further. The committee proposes a four panel brochure describing the aims, purposes and functions of the Academy and will be directed to the industries of the state. There would be several categories of industrial membership, and each would receive copies of the Journal and of the Junior Academy Handbook and Transactions. The Executive Committee concurred with these proposals and the ad hoc committee will proceed with drafting a proposed brochure.

OTHER BUSINESS

1. President Lundberg presented the following memo from Dr. R. K. Wibking:

"To: Geography Departments of Tennessee Colleges and Universities. From: Dr. R. K. Wibking, Chairman, Department of Geography and Geology, Austin Peay State University, Clarksville, Tennessee 37040. Date: September 10, 1969. Subject: Geography Section in the Tennessee Academy of Science.

"The results of the survey of last May 15, 1969, were favorable toward the establishment of a separate geography section in the Tennessee Academy of Science. From 40 cards (45% return) 30 were in favor, 1 against, and 9 returned cards indicated that they would not be able to attend or there was no geography instructor at the institution.

"Dr. Gus Lundberg, President of TAS has indicated

that he will present this information to the Executive Committee this month. He did not think that there would be any deterrent to our planning to meet together at the meeting this fall.

"This will largely be an organizational meeting; however, it would be nice to have two or three papers, short reports, and other items deemed important. If you have a paper that you would like to present, send the title to me in order that it may be included on the program. If none are received by October 10, 1969, I will contact individuals about papers by phone.

"In order to conserve money, I am going to send information to each department and hope that your secretary, student assistant, or graduate assistant can be assigned to distribute the material.

"It is my understanding that we need to have at least 15 members in order to have a separate section in geography."

A motion was passed to approve the request provided that 15 members would form the separate geography section. The President would bring the request up at the Business Meeting for the approval of the membership.

2. A motion was passed to make the Honorable

Frank J. Runyon an honorary member of the Academy for his many efforts in obtaining financial assistance for the Academy.

3. Motions were passed expressing thanks to Dr. Donald Caplenor for his excellent work as Editor of the Journal, and to Dr. Gus Lundberg for his excellent efforts as President of the Academy during 1969.

4. The Secretary read letters of invitation for the 1970 annual meeting site from Dr. C. C. Humphreys, President of Memphis State University; Dr. David Alexander, President of Southwestern at Memphis; Mrs. Lois Beach, Chairman of the Natural Science Department at Lee College; Dr. Gordon E. Hunter, Chairman of the Biology Department at Tennessee Technological University; and from Dr. John A. Patten, Head of the Biology Department at Middle Tennessee State University. After some deliberation, a motion was passed to accept the invitation of President Alexander at Southwestern at Memphis.

The meeting was adjourned at 4:20 P.M. C.S.T.

THE SEVENTY-NINTH MEETING OF THE TENNESSEE ACADEMY OF SCIENCE

NOVEMBER 21-22, 1969

THE UNIVERSITY OF THE SOUTH

The seventy-ninth meeting of the Tennessee Academy of Science was held November 21-22, 1969, at the University of the South, Sewanee, Tennessee. Dr. H. Malcolm Owen, Chairman of the Biology Department at The University of the South was Chairman of the Local Arrangements Committee, and Dr. James L. Wilson, The University of Tennessee Nashville Center, was Program Chairman.

A total of 319 persons registered for the meeting. Of these, 182 were university-college professors, 89 were university-college students, 9 were high school teachers, 2 were high school students, 8 were from the ORNL, 3 were from private industry, 14 were from state divisions, 2 were from the State Department of Education, 2 were from the U.S.D.A. Forest Service, and 8 were visitors.

The General Session was held in the Blackman Auditorium of the Woods Laboratories Building on Friday morning beginning at 10:00 A.M. C.S.T. President Gustave H. Lundberg presided and the welcome was delivered by Dr. Edward McCrady, Vice-Chancellor of The University of the South. The theme of the session was Space—Our New Frontier. Section meetings were held Friday afternoon; 66 papers were presented. The Annual Business Meeting was held in the Blackman Auditorium of the Woods Laboratories Building at 5:00 P.M. C.S.T.

The Annual Dinner was held in the dining hall of the Sewanee Military Academy at 7:30 P.M. C.S.T., Friday

evening. The attendance was 160. President Gustave H. Lundberg presided, and the address was delivered by Dr. E. Baylis Shanks, Professor of Mathematics, Vanderbilt University, Nashville, who spoke on "Mathematical Contributions to Space Exploration."

The Collegiate Division held its meeting on Saturday morning at 9:00 A.M. C.S.T. in the Blackman Auditorium of the Woods Laboratories Building. Dr. Richard J. Raridon chaired the meeting, and eight papers were presented.

ANNUAL BUSINESS MEETING

The annual business meeting of the Tennessee Academy of Science was called to order by President Gustave H. Lundberg at 5:10 P.M. C.S.T. in the Blackman Auditorium of the Woods Laboratories Building at The University of the South in Sewanee, Tennessee, on November 21, 1969. Sixty-three persons were present.

The Secretary reported that during 1969, there were 34 new members, one drop reported to the Secretary, and seven deaths. During the annual meeting, there were 34 new memberships. Academy memberships now stand at 917. A motion was passed to approve all 1969 applications for membership.

The reports of the Treasurer, the Editor, the Director of the Collegiate Division, the Director of the Junior Academy, the Director of the Visiting Scientist Program, the Director of the Science Talent Search Committee, the President, and the Director of the Reelfoot Lake Biological Station were similar to those presented