

been recommended by the Executive Committee and that a copy has been sent to every voting member of the Academy at least fifteen days before the date of the meeting.

ARTICLE X

Bylaws

Bylaws may be adopted, amended, or repealed at any annual meeting by a majority vote of the voting members present.

Section 1. — The annual dues of members and Fellows are \$5.00, except that all teachers below the college level shall pay dues at \$3.00. Honorary members are exempt from the payment of dues.

Section 2. — Any member that contributes ten dollars (\$10.00) or more to the Academy becomes a Sustaining Member for that year. Institutions may also be elected to Sustaining Membership by the Executive Committee.

Section 3. — A person, institution or business organization may be elected by the Executive Committee to Supporting Membership. The annual dues for such memberships are \$25.00.

Section 4. — Any member who makes a single payment of \$75.00 becomes a Life Member and may enjoy all the privileges of the Academy without further payment of dues.

Section 5. — Any person, institution, or business organization contributing \$100.00 or more to the Academy becomes a Patron of the Academy.

Section 6. — Notice of all meetings of the Academy shall be sent to all of the members at least 2 months in advance of the date of the meeting.

Section 7. — A program committee, of which the officer of highest rank residing near the place of meeting shall be the chairman, shall be appointed by this chairman at least six months in advance of the date of the meeting.

Section 8. — Election of officers, except the Editor and the Director of the Reelfoot Lake Biological Station, shall be by ballot, but, with unanimous consent of the members the Secretary may cast one ballot, representing the unanimous vote of the members present. A nominating committee shall be appointed by the president before the annual business meeting to nominate officers to serve the Academy during the ensuing year.

Section 9. — A committee of three on resolutions shall be appointed by the President before the annual meeting.

Section 10. — Any member one year in arrears for dues shall be ineligible to vote to hold an elective office in the Academy. The Journal of the Tennessee Academy of Science may be withheld from members in arrears at the discretion of the Executive Committee, until dues in arrears shall have been paid.

Section 11. — The order of the business at annual meetings shall be as follows:

1. Call to order by the President.
2. Reading of the minutes of the previous meeting.
3. Reports of officers.
4. Election of members.
5. Business.
6. Reports of committees.
7. Election of officers.
8. Adjournment.

The order of business may be changed.

Section 12. — Bylaws may be adopted, amended, or repealed at any annual meeting by a majority vote of the voting members present.

Section 13. — The rules contained in Robert's Rules of Order shall govern the Academy in all cases in which they are not inconsistent with the Constitution and Bylaws of this organization.

JOURNAL OF THE TENNESSEE ACADEMY OF SCIENCE

Volume 47, Number 2, April, 1972

PROCEEDINGS OF THE TENNESSEE ACADEMY OF SCIENCE FOR 1971

JAMES D. CAPONETTI, *Secretary*

THE UNIVERSITY OF TENNESSEE, KNOXVILLE

EXECUTIVE COMMITTEE MEETINGS

January Meeting, 1971

The Executive Committee Meeting of the Tennessee Academy of Science was called to order by the President at 7:55 P.M. CST in the Walnut Room of the H. G. Hill Student Center, George Peabody College, Nashville, on January 29, 1971. Members present were Richard J. Raridon, President and Director of the Collegiate Division; James L. Wilson, Past-President; Arthur W. Jones, President-Elect; James D. Caponetti, Secretary; Robert L. Wilson, Treasurer; Gus Tomlinson, Journal Editor; Mayme Lee Blankenship, Associate Journal Editor; 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; Joe P. Minor, Consultant on Science Education Activities; Robert F. Sears, John G. Parchment, and Raymond T. Tanner, Members-at-Large.

The *Secretary* passed out printed copies of the Minutes of the November, 1970, Executive Committee Meeting and the Annual Business Meeting. They were read, one correction made, and then approved. Since the Annual Meeting, 14 new members have joined the Academy. A motion was seconded and passed to accept the 14 applicants into membership in the Academy. Total membership at the moment is 886.

The *Treasurer* submitted his report. As of January 1, 1970, the balance was \$9,427.78. Receipts, which included the ap-

propriation by the Tennessee State Department of Education, was amounted to \$16,635.75. Total cash available, therefore, was \$26,063.53. Disbursements were \$18,146.91 leaving a balance of \$7,916.32 as of December 31, 1970. The Treasurer then submitted the Auditor's report as follows:

"I have examined the Treasurer's Report of cash receipts and disbursements, operations account, for the period, January 1, 1970 to December 31, 1970. In my opinion, on the basis of information made available to me, the statements fairly present the transactions of these accounts." Signed: Rayford J. McLaurin, Auditor, Chattanooga, Tennessee.

A motion was passed accepting the reports of the Treasurer and the Auditor.

The Editor submitted the following report:

"I am including copies of the Editor's Report, 1970, which was submitted at the November Academy meeting. Most of the Editor's and Associate Editor's activities for the past year are summarized therein. A brief summary of points which the Editor would like to call to the attention of the Executive Committee are listed below:

1. The January issue of the Journal was published on schedule. Four new manuscripts have been received since the November meeting.

2. The mailing list has already undergone one revision since November and is undergoing another at this time. Hopefully, three revisions will have corrected most of our errors.

3. Mel Mayfield at Austin Peay indicates that we must move back issues of the Journal from Austin Peay. The problem was one of space limitations compounded by termite damage. A new system of dealing with back issues of more than two years vintage should be devised.

4. The autobiography of Dr. Samuel Colville Lind will be published in the Journal soon unless suggestions to the contrary are received from the Executive Committee. Feedback from the November meeting has been interpreted as a show of interest in his autobiography. Publication of the autobiography may require that issue of the Journal to run as much as forty pages in length.

5. The interest that has been expressed for publication of Dr. Lind's autobiography suggests that some or all quarterly issues might focus on special problems, current issues, etc. Such suggestions require some elaboration which will be reported orally by the Editor."

A motion was passed to accept the Editor's report.

The Director of the Visiting Scientists Program passed out copies of the current (1970-71) roster of Visiting Scientists and submitted the following report:

"The Visiting Scientist Program in the academic year of 1970-71 operated on a budget of \$2,500.00 with a projected number of sixty visits to schools. The program was able to successfully complete 61 visits while staying within the budget limitations. The ongoing success of the VSP and the relatively large number of visits made were due to a number of factors, as for example:

1. The continued cooperation of a large number of scientists willing to visit schools on a minimum honorarium and expense basis.

2. Restriction of most visits to geographic areas near to the home of the scientists. Efforts were made to arrange visits so that travel (one way) distances of less than 100 miles was used in most cases.

3. The cooperation of The University of Tennessee and College of Education (Dept. of Curriculum and Instruction) in furnishing many direct and indirect services such as clerical help, service of the director, etc.

4. Endorsement and promotion of the Program by officials in the State Department of Education and by Superintendents of the states school systems.

5. Funding by the Tennessee State Legislature.

A noteworthy addition to the VSP plans for 1971-72 includes the cooperation of the American Nuclear Society—Oak Ridge Section, Oak Ridge, Tennessee in underwriting the costs for visits made by volunteer scientists in the nuclear field."

A motion was passed to accept the Director's report.

The Director of the Junior Academy submitted the following report:

"I am re-submitting the financial statement of the Tennessee Junior Academy of Science as submitted to the TAS Director's

at our Annual Meeting in Memphis, with some projection into the year 1971-1972.

I do not know where economies could best be made for the continuation of our program for the balance of this year. It may appear that the allocation for the Director's services could be cut. This allowance was based on the NSF allowance of one-month's vacation salary when I started with the Junior Academy some five or six years ago. This has not been revised upward since 1966—except for the addition of \$50.00 last year. At the time of the NSF squeeze, I did reduce the allowance for the Director to \$600.00. This was then included in the NSF Grant.

The Director's allowance was based on one-month's vacation salary as this was the practice at the time that I became Director of the Junior Academy in 1966. To be realistic, this should be extended to \$1,500 for 1971-72. This may sound excessive, but my school makes no allowance on my time or work schedule for this activity. The Junior Academy has consumed my summer vacation time for each of the past five summers while we were processing the *Handbook and Transactions* booklet as well as the mailing of announcements. It is really a continuous operation from about March 15 until the distribution of announcements in the Fall. It is now time to start probing for possible financial help from the NSF for another year.

The Academy has been sponsoring a number of fine programs with NSF support. Maybe it is time to take a second look and establish a system of priorities on how much and what programs to support. I believe that it was the Junior Academy need that was sold to the State Department of Education before funds were forth-coming.

Due to the amount and length of time that the Junior Academy of Science has taken and always with the feeling of insecurity in making long range plans, I feel it better for the organization if I begin to terminate my services as Director. This termination to take place at the discretion of this board and the officers of the Academy, but in no event later than the mid-winter meeting, 1972. This would allow us time to finish out this year's program and get the proposal and announcements for the next year on the move. I will be glad to help in the transfer in any way I can.

In your quest for my replacement, I wish to suggest that Dr. William Pafford, a colleague of mine at ETSU has mentioned that he might serve in this capacity if requested. His specialty is in the area of Science Education. There are many others equally capable.

The following past presidents—Dr. Barclay, Prof. Mayfield, Dr. Campbell, Prof. Rusk, Dr. Lundberg, and Dr. Wilson—have each been most helpful to me in promoting the program of the Junior Academy of Science."

A motion was passed to accept the Director's report.

The Director of the Reelfoot Biological Station reported that there was no activity at the station at this moment because it is wintertime. The President requested that he and member-at-large John Parchment investigate the feasibility of getting a dozen or so colleges from the West Tennessee area to cooperate financially in setting up an operational research and teaching unit at the presently leased site of the lake. The unit would consist of a laboratory building, dormitory space, eating facilities, and other usual facilities necessary for the operation of a lake biological station.

The Director of the Collegiate Division presented the following report:

"The Collegiate Division held its annual state-wide meeting on November 21, 1970, at Southwestern at Memphis, in conjunction with the Senior Academy meeting. Twelve papers were presented by students from six schools. Three prizes of \$10 each were awarded for outstanding papers. These went to J. C. Craig, David Lipscomb College, chemistry; Walter R. Walton, Lee College, biology; and Roy Tucker, Memphis State University, physics. In addition, Lucy Rosson, Martin College, and Melinda Foster Anderson, The University of Tennessee at Knoxville, presented papers in the General Session. The total expenses incurred were \$490.85."

A motion was passed to accept the Director's report.

The following two reports were submitted by Richard J. Raridon who, as our AAAS representative, attended both the AAS Meeting and the AAAS Council Meeting held in conjunction with the AAAS Meetings in Chicago, Illinois, December 26-31, 1970.

"Report by Richard J. Raridon on the Association of Academies of Science Meeting held at the A.A.A.S. Meeting in Chicago, Illinois, on December 28, 1970.

The Association of Academies of Science, formerly the Academy Conference, is comprised of two representatives from each academy affiliated with the AAAS, and its officers. It has a number of committees which study matters of interest to academies and report their conclusions at the annual meetings. Thus, these meetings provide an opportunity for representatives, officers, and visitors to discuss academy objectives to their mutual advantage. A Directory and Proceedings which carries a full report of the annual meetings and an account of the activities of academies is published annually. Another function of the Association is the sponsorship of the American Junior Academy of Science which meets in conjunction with the Association.

This year's meeting of AAS was arranged by Harry J. Bennett, retiring president of AAS and Professor of Zoology at Louisiana State University. The two half-day sessions and the evening banquet were held at the Essex Inn. The morning session was called to order at 9:00 A.M. by Chairman Glenn W. Stewart, Associate Professor of Geology, University of New Hampshire, who introduced Dr. J. Dudley Herron, Association Professor of Chemistry and Education, Purdue University, and Coordinator, Teaching Education Project, AAAS Commission on Science Education. The title of Dr. Herron's talk was "For Want of a Shoe the Horse Was Lost: The AAAS Recommendations for Science Preparation of Elementary Teachers: What Good Are They?"

The topic was pursued further by a panel discussion in the afternoon. The session was called to order at 1:30 P.M. by Frank W. Starr, Science Consultant, Waterloo Community Schools, Iowa, and Director, American Junior Academy of Science. The discussants were: Dr. Herron; John R. Mayor, Director of Education for AAAS; and Paul DeHart Hurd, Professor of Education, Stanford University. Several points were brought out: Present college science courses do not give future teachers what they will need later in the elementary classroom. What is missing is anything that might reasonably be identified as science, at least in the sense in which science is known to scientists. Many teachers don't believe the facts that they're presenting to their students, such as light objects and heavy objects falling with the same acceleration. New courses need to be designed. The consensus seemed to be that the best course, possibly required by all freshmen, would be a general course covering topics in all fields of science, but taught by one instructor. The suggestion was made that each academy should contact their state officials and offer assistance and advice to the state committee on teacher education, with particular emphasis on helping approve college programs for teachers.

The business meeting of the Association was chaired by the President, Dr. Wilmer W. Tanner, Professor of Zoology, Brigham Young University. The usual reports by officers and committees were presented. The Association expressed its appreciation to Dr. Clinton L. Baker for his compilation of the history of the Academy Conference for the period 1926-1970. The Secretary asked that each academy send in information on its activities for the Association's Newsletter. As Chairman of the AAS Committee on Collegiate Academies, I presented a report on a survey of collegiate activities among the various state academies. A copy of this report is appended. Tennessee continues to be one of the few states with a full fledged Collegiate Division.

The nominating committee presented the following candidates: President-elect, Charles M. Vaughn, Miami of Ohio; Secretary-Treasurer, Charles E. DePoe (Incumbent); Archivist, Harry J. Bennett. The candidates were unanimously elected.

At the evening banquet, compliments of AAAS, incoming president, Dr. Glenn W. Stewart, spoke of the topic "Environmental Geology." A distinguished service award was presented to Dr. John R. Mayor.

"Report by Richard J. Raridon on the A.A.A.S. Council Meeting held in Chicago, Illinois, December 30, 1970.

The Tennessee Academy of Science is one of over 500 societies which are affiliated with AAAS and is thus entitled to be represented on the AAAS Council. The meeting was called to order at 9:05 A.M. by the President of AAAS, Athelstein Spilhaus, in the Grand Ballroom of the Conrad Hilton Hotel. There were about 200 Council members in attendance and they were admitted only by special passes. Visitors were allowed to sit

in a special section at the back of the chamber and about 25 did so. A number of reports and resolutions were presented, some of which are summarized here.

The chairman of the Board of Directors, H. Bentley Glass, presented his report and announced that William Bevan, formerly Vice President and Provost at the Johns Hopkins University, has succeeded Dael Wolfe as AAAS Executive Officer. The Board has established a Youth Council, composed of six young scientists, and it is now functioning. A Governance Committee has been formed to examine the procedures for nominating and electing officers, constituting the Council, and defining requirements for individual membership, society affiliation, and sectional organization. The last of the December meetings of AAAS will be held in Philadelphia in 1971 and in Washington, D. C., in 1972. Plans are under way which, hopefully, will eventuate in an inter-American meeting in Mexico City in June 1973. The AAAS will then shift to a new meeting time in late February or early March. Meetings will be held in San Francisco in 1974, New York City in 1975, Moston in 1976, and in Denver in 1977.

The chairman of the Committee on Nominations and Elections announced that Glenn T. Seaborg is the new President-elect of AAAS. Other committees reporting were those on Arid Lands, Environmental Alterations, Population and Reproduction Control, Public Understanding of Science, Science Education, Science in the Promotion of Human Welfare, Youth Council, Governance, and Herbicide Assessment.

After considerable discussion, Council voted to elect the following organizations to AAAS affiliation: International Communication Association, National Association of Social Workers, and the Rural Sociological Society.

Council passed the following constitutional amendment: Council representatives named by affiliated organizations shall serve for terms of at least three years. If a named representative of an affiliated organization is unable to attend a meeting of the Council, and if the organization wishes to be represented by a substitute, the president shall designate a substitute, while preserving continuity if possible.

The Council passed the following resolutions: (1) The Council of the AAAS commends the United States Government for its announced intention rapidly to phase out the use of all herbicides in Vietnam and recommends their immediate suspension in Indochina. (2) The AAAS urges its members to familiarize themselves with the modernized metric (S I) system and use it in their published work whenever effective communications are not impaired by doing so, and urges the Federal Government in its study of alternative national policies toward metrication to recommend a clear national commitment to eventual conversion to predominantly metric usage and plan specific steps for implementing a voluntary national program of conversion during the coming decade. (3) The AAAS reaffirms its commitment to (a) the principle of equal opportunity for all scientists, regardless of sex, race, creed, or national origin, to follow their scholarly and professional interests and (b) the principle of their recognition and treatment, in wages and all other respects, on the basis of merit alone. Adjourned 12:45 P.M.—No afternoon session."

A motion was passed to accept both above reports.

OTHER BUSINESS

1. The Secretary reported that he received a letter from Hans Nussbaum, Business Manager of the AAAS, that the 1971 AAAS Research Grant to the Academy amount to \$281.00. From 1970 there remains \$281.00. The total this year, therefore, is \$562.00. A member of the Research Committee, Joe P. Minor, reported that two requests of \$20.00 each were awarded. Many requests were received for dangerous projects which were not only hazardous but also involved the breaking of state laws. All such projects were refused support.

2. For the AAAS Meeting next December in Philadelphia, Pennsylvania, President Raridon volunteered to be both representative to the Association of Academies of Science (AAS) Meeting and delegate to the AAAS Council Meeting.

3. The President appointed a committee of himself, the Secretary, and the President-Elect to assemble the membership brochure into a six-sided-three fold pamphlet.

4. The Editor had reported that he had a backlog of papers.

A motion was passed to authorize him to increase the number of journal pages so that more papers could be published sooner. The number of increased pages was left to the Editor's discretion.

The Secretary requested and received permission to send a congratulatory letter to the newly appointed Commissioner of the State Department of Education, The Honorable E. C. Stimbart. The meeting was adjourned at 12:30 A.M. CST.

November Meeting, 1971

The Executive Committee Meeting of the Tennessee Academy of Science was called to order by the President at 7:15 P.M. in the Blue Room of the University Inn in Murfreesboro, TN, on November 18, 1971. Members present were Richard J. Haridon, President and Director of the Collegiate Division; James L. Wilson, Past-President; Arthur W. Jones, President Elect; James D. Caponetti, Secretary; Robert L. Wilson, Treasurer; Gus Tomlinson, Journal Editor; William F. Nelson, Director of the Reelfoot Lake Biological Station; John H. Bailey, Director of the Junior Academy; Paul Wishart, Director of the Visiting Scientists Program; Joe P. Minor, Consultant on Science Education Activities; Robert F. Sears, J. Gerald Parchment, and Raymond J. Tanner, Members-at-Large.

The Secretary passed out printed copies of the Minutes of the January, 1971, Executive Committee Meeting. They were read and approved. The Secretary further reported that from the beginning of 1971 to this moment, there were 32 new membership applications. A motion was seconded and passed to accept the 32 applicants into membership in the Academy. Total membership is now 750.

The Treasurer submitted an interim report. As of January 1, the balance was \$7,964.73. Receipts, which included appropriations by the Tennessee State Department of Education, amounted to \$15,774.31. Total cash available, therefore, was \$23,739.04. Disbursements were \$16,012.19 leaving a balance of \$7,726.85 as of November 1. A calendar year report will be presented by the Treasurer at the January, 1972, Executive Committee Meeting. The Treasurer further reported that optional contributions to the Academy this year have amounted to \$370.00. A listing of the contributors will be printed in the April issue of the Journal. A motion was passed to accept the Treasurer's report.

The Editor submitted the following report:

"The Editor and Associate Editor have had another busy year. Miss Blankenship has continued to do yeoman service as Associate Editor during part of her work day. George Peabody College has continued its generosity by providing funds for her services. With her support and the aid of our untiring sectional editors, four number of Volume 46 have been published since the November meeting last year. In addition to regular annual inclusions in the Journal, i.e. proceedings, news events, abstracts, reports, title pages and index, etc., the 1971 volume contains 34 papers which is an increase of 15 over the total of 19 for last year. The breakdown by subject area for 1971 publications is as follows:

Abstracts	2 sets
Botany	6
Chemistry	5
Geology-Geography	4
Index	1
Mathematics	1
Medical Sciences	1
Physio-Astronomy	1
Proceedings	1
Reelfoot Lake Report	1
Zoology	11
	34

Nine manuscripts from 1970 are on hand for publication and 17 new manuscripts were received during 1971. One paper was rejected for publication and returned to its author. Thus, a total of 25 manuscripts are in some phase of preparation for publication. Of these, 4 are being reviewed by sectional editors, 7 are under author revision, and 14 have been accepted for publication. The breakdown by subject area for these manuscripts is as follows:

Botany	7
Chemistry	1
Geography	4
Geology	1
Mathematics	1
Medical Sciences	1
Zoology	10
	25

A backlog of this magnitude may seem large but one much smaller than this would not permit the essential reviews, criticisms and revisions which are generally necessary to prepare a manuscript for publication.

Publication of the Journal continues on schedule. Each issue was published and mailed on schedule during the past year. Revision of the mailing list which was begun during 1970 has been continued throughout the past year. As a result, a substantial number of recipients who had not paid their subscriptions for either did not pay or did not respond were removed from the mailing list. In addition a number of name duplications were removed. The current mailing list includes 747 copies for members, 61 copies for reciprocal exchange, and 150 paid subscriptions for a total circulation of 958. The net effect is that the current circulation of 958 is down 232 from the total of 1190 of last year. Since 1300 copies continue to be printed, an excess of 342 copies currently remain for future sale. In view of the magnitude of this excess, some reduction in the total number of copies which are printed may be possible during the coming year.

The present editor for JTAS has served two years. The three year commitment which an editor customarily makes to the academy upon assuming the editorship would extend through 1972. The current editor is prepared to make a commitment through 1972 at the pleasure of and upon the approval of academy membership and its officers. Whether any additional commitment can be made by the editor beyond 1972 depends upon continued support for an associate editor and a commitment by the editor's host institution for release time to devote to the Journal. It is also predicated upon continued approval and support of the editor by the academy. Should such support from the editor's host institution not be possible for 1973, the present editor would have no choice but to insist that the academy select a new editor effective January 1, 1973. In such case, the academy would be notified prior to the November meeting 1972 as to the need for replacement.

JTAS SUMMARY REPORT 1971

- The total number of papers published in 1971 was 34 which is an increase of 15 over the total of 19 for 1970. This increase in number of papers was due primarily to an increase in the size of the Journal from 32 to 40 pages.
- The backlog of papers to be published is now down to 25 from a high of 34 at the time of last year's meeting. New papers received this year totalled 17, a decrease from 27 in 1970.
- Published papers for 1971 show a wider distribution with respect to subject areas than in previous year. Zoology and Botany papers continued to be published in substantial numbers but publication of papers in Chemistry, Geology and Geography were substantially increased this year.
- The current circulation list is down from 1190 in 1970 to 958 at the present time. This is due primarily to corrections in the mailing list to delete members who have not paid dues in more than two years and to correct duplications which were found in substantial numbers in the old mailing list. Some decrease in new members for 1971 as compared to 1970 also contributed to the lower circulation figure."

A motion was passed accepting the report of the Editor. The Editor suggested that since the membership list has been corrected to reflect a truer number of members, the total number of journal copies printed should also be corrected. A motion was passed to reduce the number of journal issues to 1100 other than that issue which contains the report of the Reelfoot Lake Biological Station which should remain at 1300.

The Director of the Collegiate Division submitted the following report:

"The Collegiate Division of the Tennessee Academy of Science held three regional meetings during the spring of 1971 under

the capable direction of the regional sponsors, Dr. Robert G. Ziegler, Lincoln Memorial University, Harrogate; Dr. John T. Netterville, David Lipscomb College, Nashville; and Dr. George K. Rouse, Bethel College, McKenzie. The programs of the meetings are listed below. The total expenses for the three meetings was \$545.23.

Eastern Region, April 17, 1971, Lee College, Cleveland
Infrared Spectra of Saturated Fatty Acids, Randall Wolfe, Tennessee Wesleyan College

Progress Report on Some Reactions of Benzene Dicarboxaldehydes, Steve Roach, Carson-Newman College

Progress Report on Some Physical Properties of Reaction Products of Benzene Dicarboxaldehydes, Vicky Williams, Carson-Newman College

Preliminary Investigation of Mercuroated Azo Dyes, Wayne DeWitte, King College

Preliminary Examination of the Synthesis of 4- and 6-alkyl Substituted 2(1H) Pyridones, Tedora Stevens, King College

A Photoelectric Study of Selected Magnetic Variable Stars, Jack Howard, King College

The Effects of Social Reinforcement upon Retroactive Inhibition, Rebecca Wilson, Tennessee Wesleyan College

The Negative Contrast Effect as a Function of Locus of Presentation and Duration of Discriminative Cues, Roland F. Gilbert and William E. Seaver, III, King College

Single Alternation Patterning in the Skimmer Box at 24 Hour Inter-trial Interval, Jean B. Caldwell and John Kexley, King College

The Effects of First- and Second-Set Intraperitoneal Allografts on a Third-Set Intradermal Allograft, William W. Blake, King College

The Effect of Red Blood Cells on the Development of Allograft Rejection, Donald Barker, King College

Trypanosoma theileri in Cattle in Tennessee During the Winter Months, Randolph Greaves, Lee College

Preliminary Comparison of Monogenetic Trematodes Found in Lepomis cyanelus from Bradley County, Tennessee, Walter R. Walton, Lee College

Middle Region, April, 1971, Martin College, Pulaski
Contamination of Percy Priest Lake, Mill Creek, and Severally Creek by Undisinfected Sewage from February 20, 1971, to April 10, 1971, Donald Anderson, Carol Bush, Beverly Daniel, Michell Gentry, Michael Hood, and Steven Thomas, David Lipscomb College

Trace Element Analysis of Air Pollution via Atomic Absorption Spectroscopy, Mike Ruebachman, Middle Tennessee State University

A Pollution Survey of Shoal Creek in Lawrenceburg, Tennessee, Jacquelyn Perry and Susan Nix, Martin College

The Effects of Ultraviolet Radiation on the Antibiotic Characteristics of Some Known Bacteria, Lenord Lee Dunn, Tennessee Technological University

NMR Study of Lanthanide Salts Dissolved in Alcohol, Allen Neese, David Lipscomb College

NMR Studies of the Benzene-Antimony Chloride Molecular Complex, Mike Smith, David Lipscomb College

Equilibrium Between Pyranose and Furanose Forms of Fructose in Solution, Gary E. Carnahan, David Lipscomb College

A Spectroscopic Method Utilizing Characteristic X-Ray Fluorescence, Doug Cantrell, Middle Tennessee State University

X-Ray and Alpha Particle Gauging of Thin Films, Alva H. Welch, Jr., Middle Tennessee State University

Honesty: Its Relationship to Religious Attitudes, Charles Floyd and Ricky Smith, David Lipscomb College

Effect of Advertising on Cola Selection, Eddie Baker, David Lipscomb College

Effect of Advertising on Cola Selection, Eddie Baker, David Lipscomb College

Volunteering as a Function of Field Structures, Mary Ann Morrison and Linda K. Sherwood, David Lipscomb College

Using Behavior Modification Techniques to Motivate Juvenile Delinquents to Learn, John Johnson, David Lipscomb College

Examination of Two Psychophysiological Principles: Set and Law of Initial Values, Connie White, David Lipscomb College

Western Region, April 24, 1971, Jackson State Community College, Jackson

A Short-term Limnological Study of Maple's Creek Lake, Bob McClure and John Santangelo, Bethel College

Identification of Some Pennsylvanian Diatoms from Memphis Waters, W. Kieth Lars, Christian Brothers College

A Study of the Cicindelidae (Tiger Beetle) in West Tennessee, Michael Mingea and Omar E. Smith, Memphis State University

A Preliminary Study of the Effects of Freezing and/or Refrigeration on Storage of Blood Serum, James S. Flannery and Charles J. Biggers, Memphis State University

Mechanism of Pyridazine Resistance in Chlamydomonas eugametos, James Richmond McCarty, Southwestern at Memphis

Comparative Study of the Effects of Copper Sulfate and Sodium Chloride upon the Growing Habits of Planktonic Algae Cultures, Bro. David Arnold, Christian Brothers College

Biotic Relationship of Pandorina morum and Pseudomonas fluorescens, Albert Ciniglio, Christian Brothers College

Gel Diffusion Determination of Common Antigens in Bartonella bacilliformis and Other Gram Negative Bacteria, Gene Franco, Christian Brothers College

Beard Growth in Relation to Testosterone, Paul Mascari, Christian Brothers College

Effects of NaF in Drinking Water of Mice, Clark Irven, Christian Brothers College

Effects of Isolation Rearing on Mice, Thomas Steffek, Christian Brothers College

A Summary of Neutron Activation Analysis and a Description of an Experiment Performed at Argonne National Lab, Bill Glover, Lambuth College

Analysis of Metazol TK-100 (Thiobenzazole) as a Mildewicide, Robert Pennington, Lambuth College

Semigroup: An Extension of Groupoids, Rita Thompson, Siena College

The Measurement of Transference Numbers-A Laboratory Experiment, W. L. Wallace, J. C. Williams, and W. H. Uber, Memphis State University

Fatty Acid Metabolism by Aspergillus as a Means of Differentiating Between Species, James Robert Farril, Southwestern at Memphis

Reversion of T4+ Bacteriophage to Another Mutant Form, Paul Evans, Christian Brothers College

Extraction of Plant Pigments, β -Carotene and Lycopene, Patrick Murphy, Christian Brothers College

Chronopotentiometry of Human Blood Hemoglobin, William Owens, Christian Brothers College

The Effects of Intravenous Perfusion of Thorazine and Sodium Caparsolate on Mouse Lactic Dehydrogenase Determinations, Robert M. Kraus, Christian Brothers College

The Effect of Three Broad Spectrum Antibiotics on Bartonella bacilliformis, Robert N. Fedehofer, Christian Brothers College

Some Nutritional Effects on Maize Dwarf Mosaic Virus Infected Corn Growth and Chlorophyll Concentration, James Robert Farrell, Southwestern at Memphis

A motion was passed to accept the Director's report. He presented a budget request of \$1,000.00 for 1972.

"The 1970-71 JTAS program sponsored by the TAS was started with invitations to all high school Science and Mathematics teachers in Tennessee. They were asked to encourage their science students to carry out a science project during the school year and to submit a written scientific report of their program to the Junior Academy office for judging. The science teacher, in each case served as the first member of the judging committee. The teacher would certify that the project was legitimate and carried out under her supervision. The report would properly introduce the problem, describe the procedure, examine the data, and show his or her conclusion and point out the opportunity for further experimentation.

After careful screening by a committee, a limited number of twenty-five students, together with their teacher were invited to present their papers to their peers from other schools in the state.

The two day meeting was held on the Vanderbilt campus as guests of the Stevenson Physical Science Center, April 23-24, 1971. The cost of the 1970-71 JTAS program was borne by the NSF for the sum of \$2,000.00 and the balance of \$1,335.81 by

the TAS and the State Board of Education. We were advised that further funding of the TJAS by the NSF would be eliminated for subsequent years. The anticipated budget for this year totals \$3,200.00.

At the close of the 1970-71 year 150 copies of the Handbook of Proceeding were prepared and distributed. This book contains reproductions of five outstanding papers and the story of our year activities. These books will be distributed to the participating in the 1970-71 program, either by attending the meeting or via having students who submitted papers for consideration and certain select school system administrators of Southern Association accredited high schools.

The 1971-72 preliminary notices have just been distributed to the high school science teachers inviting participation. With NSF funding curtailed we are planning the Spring 1972 program with 12 students together with their teachers to a one day meeting beginning with a tour of the science facilities at Van derbilt, a luncheon, and a paper reading session for Friday afternoon-April 21, 1972.

The 1971-72 program is being financed by a grant from the State Department of Education to the Senior Academy.

To the preliminary readers (mostly science staff members at ETSU), judges (from the TAS members in the Nashville area), staff at Vanderbilt University who hosted the 1971 Spring Meeting, the food services at Vanderbilt who served a wonderful banquet, the State Department of Education and the Officers and Directors of the TAS we owe a debt of gratitude for making this program possible. My secretary, Mrs. Jean Knox, and her crew of student assistants aided in the detailed work necessary to see this program to completion."

A motion was passed to accept the Director's report. He requested a budget of \$3,200.00 for 1972.

The Director of the Visiting Scientists Program gave his report as follows:

"The Visiting Scientist Program in the academic year of 1970-71 operated on a budget of \$2,500.00 with a projected number of 60 visits to schools. The program was able to successfully complete 61 visits while staying within the budget limitations. The ongoing success of the VSP and the relatively large number of visits made were due to a number of factors, as for example:

1. The continued cooperation of a large number of scientists willing to visit schools on a minimur honorarium and expense basis.

2. Restriction of most visits to geographic areas near the home of the scientists. Efforts were made to arrange visits so that travel (one way) distances of less than 100 miles were used in most cases.

3. The cooperation of The University of Tennessee and College of Education (Dept. of Curriculum and Instruction) in furnishing many direct and indirect services such as clerical help, service of the idrector, etc.

4. Endorsement and promotion of the Program by officials in the State Department of Education and by Superintendents of the states school systems.

5. Funding by the Tennessee State Legislature.

A noteworthy addition to the VSP plans for 1971-72 includes the cooperation of the American Nuclear Society-Oak Ridge Section in underwriting the costs for visits made by volunteer scientists in the nuclear field."

A motion was passed to accept the Director's report. He requested a budget of \$2,500.00 for 1972.

The Director of the Reelfoot Lake Biological Station submitted his report:

"This past year, the Station saw little activity. The summer courses offered by UTM were taught on the campus, and filled to capacity. Field trips sufficed to expose the students to practical field biology, and the facilities at the station were not utilized. It is just not feasible economically to house students at the lake and teach there. Since this is true, we are attempting to refurbish the station to the point where it can be used by small parties of researchers as a base out of which to operate while doing field work in the area. Vandalism reached unparalleled heights this year, and we are renewing attempts to locate a local citizen who owns a trailer home in the hope that we can permit him to park on the station grounds, and perhaps pay his electric bill, in return for keeping an eye on the station. This seems to be the only solution to the vandalism problem. We

have tried before to find someone without success, but are making renewed efforts.

A party of faculty from UTM spent part of last weekend cleaning up around the station, and repairing the door and frame so it can be locked again. Work will continue there tomorrow. Several of our staff members indicate a desire to use the station this summer, and this is the reason for the renewed effort. In addition, one of our staff, currently on leave, will return this summer, and being a limnologist, will hopefully put the station's facilities to good use. A moderate amount of money will have to be spent to put the facilities in operating condition and to maintain them, but if the indications hold true, the station should see some use this summer. I also plan to draft a letter to the heads of all Biology Departments in the state notifying them of the availability of space and telling them exactly what facilities are there. Hopefully, such publicity may awaken some interest in field work in West Tennessee, where such interest seems to have waned in recent years."

A motion was passed to accept the Director's report.

President Raridon presented the following report:

"It has been a pleasure for me to be able to serve as President of the Academy during 1971. Our very able Secretary and Treasurer have again kept the affairs of the Academy running smoothly.

We have been able to establish good relations with the new State Administration and have received an appropriation of \$11,500 to finance our programs through the coming year. We are grateful to Joe P. Minor for serving as liaison in his dual capacity in the State Department of Education and member of our Executive Committee.

We have completed the preparation of a brochure describing the activities of the Academy. A letter was sent to each member asking that individual contacts be made with local industries to request funds. We are hopeful that this approach will aid our financial situation.

Dr. Raymond L. Tanner of the University of Tennessee at Memphis joined the Executive Committee for a three-year term as the new member-at-large. The other members-at-large are Dr. Sears, whose term expires at the end of 1971 and Dr. Parchment, whose term expires at the end of 1972.

The memoirs of Dr. Samuel C. Lind are scheduled for the January, 1972, issue of the Journal. The widow and co-workers of Dr. Lind are particularly grateful of the Executive Committee for this publication. The East Tennessee Section of ACS has ordered 25 copies to be given to future speakers at the annual S. C. Lind Lecture series.

The Oak Ridge Section of the American Nuclear Society has set aside \$200 for support of the Visiting Scientist Program. They will pay the expenses of any of their members who are requested through the VSP brochure. It is expected that this will finance 10-15 additional visits beyond the 60 that will be financed with a portion of the state funds.

I want to thank the Academy membership and particularly the Executive Committee for their cooperation in making my tenure as President most enjoyable."

OTHER BUSINESS

1. A motion was passed to allow President-Elect Jones to appoint Members-at-Large to the Executive Committee as needed.

2. Dr. Paul Wishart read a letter addressed to him from Dr. Otto C. Kopp, Professor of Geology at The University of Tennessee, Knoxville, Supporting Dr. Wishart's efforts to attain the goal of teacher certification for the earth sciences. Dr. Wishart expressed the view that the Academy should also endorse such a goal. Accordingly, then, a motion was seconded and passed to endorse the establishment of certification for the earth sciences and, further, to endorse the reviw of all certification requirements for all science fields. The Secretary was instructed to put this endorsement motion in the form of a letter and send it to the Commissioner of the State Department of Education, The Honorable E. C. Stimbirt.

3. A motion was passed to make the Commissioner of the State Department of Education an Honorary Member of the Academy during his term of office. Issues of the Journal will be addressed to the office of the Commissioner.

4. After due deliberation, a motion was passed to institute a

registration fee at the annual meeting of \$2.00 for non-students and no charge for students.

5. The Executive Committee voted to accept the invitation of Dr. T. P. Copeland, Chairman of the Department of Biology at East Tennessee State University, Johnson City, as authorized by President Culp. The Secretary was instructed to write a letter of acceptance to Dr. Copeland. The Executive Committee also set the dates of November 17 and 18, 1972, for the next annual meeting.

6. After a careful review of budgets and available funds, a

THE EIGHTY-FIRST MEETING OF THE TENNESSEE ACADEMY OF SCIENCE

NOVEMBER 19-20, 1971

MIDDLE TENNESSEE STATE UNIVERSITY

The eighty-first meeting of the Tennessee Academy of Science was held November 19-20, 1971, at Middle Tennessee State University Murfreesboro, Tennessee. Dr. J. Gerald Parchment, Professor of Biology at Middle Tennessee State University, was Chairman of the Local Arrangements Committee, and Dr. Arthur W. Jones, Professor of Zoology at the University of Tennessee, Knoxville, was Program Chairman.

Approximately 325 persons registered for the meeting. Of these, 183 were university-college professors, 10 were high school teachers, 6 were O.R.A.U., 3 were from O.R.N.L., 9 were from private industry, 3 were from the State Department of Education, 3 were from state divisions, and a little over 100 students.

The General Session was held in the University Center Theatre on Friday morning beginning at 10:00 A.M. C.S.T. President Richard J. Raridon presided and the welcome was delivered by Dr. Howard Kirksey, Vice-President for Academic Affairs at Middle Tennessee State University, in behalf of Dr. Melvin G. Scarlett, President of the University. The theme of the session was Science and Society: Tennessee. Section meetings were held Friday afternoon; 75 papers were presented. The Annual Business Meeting was held in Room 100 of the George Davis Science Building at 5:00 P.M. C.S.T.

The Annual Dinner was held in the Tennessee Room of the Student Union Building at 7:30 P.M. C.S.T., Friday evening. Dinner tickets were purchased by about 125 persons. President Richard J. Raridon presided, and the address, with a question-answer session, was delivered by Dr. Gideon W. Fryer, School of Social Work. The University of Tennessee, Knoxville, who spoke on "The More or Less Deserving Poor."

The Collegiate Division held its meeting on Saturday morning at 9:00 A.M. C.S.T. in Room 100 of the George Davis Science Building. Dr. Richard J. Raridon, Director of the Collegiate Division, chaired the meeting, and 6 papers were presented by students.

The Tennessee Section of the American Association of Physics Teachers also held its meeting on Saturday morning at 9:00 A.M. C.S.T. in Room 131 of the George Davis Science Building. Dr. Raymond L. Tanner, Department of Radiology, The University of Tennessee, Memphis, chaired the meeting, and 5 papers were presented.

ANNUAL BUSINESS MEETING

The Annual Business Meeting of the Tennessee Academy of Science was called to order by President Richard J. Raridon at 5:15 P.M. C.S.T. in Room 100 of the George Davis Science Building at Middle Tennessee State University in Murfreesboro, Tennessee, on November 19, 1971. Seventy-four persons were present.

The Secretary reported that during 1971, there were 32 new membership applications. During the annual meeting, there were 19 new memberships. Total Academy membership at this moment stands at 769. A motion was passed to approve all 1971 membership applications.

The reports of the Treasurer, the Editor, the Director of the Junior Academy, the Director of the Collegiate Division, and the Director of the Visiting Scientists Program were similar to those presented earlier at the Executive Committee Meeting. The Director of the Junior Academy further added that the spring meeting is held at Vanderbilt University because he has received

motion was passed to allot \$1,000.00 to the Collegiate Division, \$2,900.00 each to the Visiting Scientists Program and the Junior Academy, \$2,500.00 to the Reelfoot Lake Biological Station (\$1,000.00 for maintenance, \$1,500.00 for the Journal), and a \$400.00 increase to the Editor's budget.

7. A motion was passed authorizing the President to appoint a committee to prepare the annual budget and submit its recommendations to the Executive Committee in time for their November meeting.

The meeting was adjourned at 1:15 A.M. C.S.T.

no other invitations, and that spring is the best time to meet for those students who have developed long term projects which are mostly complete by springtime. Again, all reports were approved by a passed motion.

The Chairman of the Auditing Committee, Dr. Myron S. McCay, submitted his Committee's report as follows:

"The Audit Committee has examined the Treasurer's records of transactions for 1971 and finds them to be accurate and clearly displayed. The annual audit by a certified accountant will be forthcoming at the end of the fiscal year. The Committee wishes to commend the Treasurer for the efficient manner in which he records and summarizes the Academy's financial affairs."

A motion was passed to accept the audit.

The Chairman of the Fellows Committee, Dr. Melburn R. Mayfield, presented the following members of the Academy as nominees to be named Fellows of the Academy:

1. Shakti K. Airee, The University of Tennessee, Martin
2. Carl D. Brown, Memphis State University, Memphis
3. Clay M. Chandler, Middle Tennessee State University, Murfreesboro
4. Edward E. C. Clebsch, The University of Tennessee, Knoxville
5. Winston L. Massey, The University of Tennessee, Chattanooga
6. Haskell C. Phillips, Austin Peay State University, Clarksville
7. Robert F. Sears, Austin Peay State University, Clarksville
8. Brother Robert L. Staub, Christian Brothers College, Memphis

A motion was seconded and passed that those named be made Fellows of the Academy.

The Chairman of the Membership Committee, Mr. Johnny O. Younghans, was absent from the meeting but had sent the following report to the President:

"The membership committee has concentrated its efforts toward distribution of the Academy Brochure. Brochures have been sent to all members who have requested them. To date, our records indicate that eight of the major industrial establishments in the state have been contacted. This is a good beginning; however, response from these companies has been discouraging. The Chairman wishes to express his appreciation to the members of this committee: John G. Byrd, Hugh H. Caudill, and Earl W. McDaniel."

A motion was passed to accept the report.

The Chairman of the Necrology Committee, Dr. Floyd M. Ford, was absent from the meeting but had arranged for one of the committee members, Dr. George W. Edwards, to read the names of the four members whose deaths came to his and the Secretary's attention during the past year:

1. Dr. Roy C. Avery, Nashville
2. Mr. J. A. Estes, Nashville
3. Dr. Horace Frazier, Nashville
4. Mr. Robert J. Shoffman, Springfield, Illinois

Dr. Edwards asked the audience to rise for a moment of silent prayer; a motion was passed to accept the Committee's report.

The Chairman of the Research Committee, Dr. Sara Wood, was absent from the meeting, but mailed the following report to the Secretary:

"In early December 1970, the Research Committee of the Tennessee Academy of Science received from Mrs. Paula Martin of Waverly High School twelve requests for grants totalling \$561.00. Of these 12 requests, five were finally approved by the