JOURNAL

OF THE

Tennessee Academy of Science

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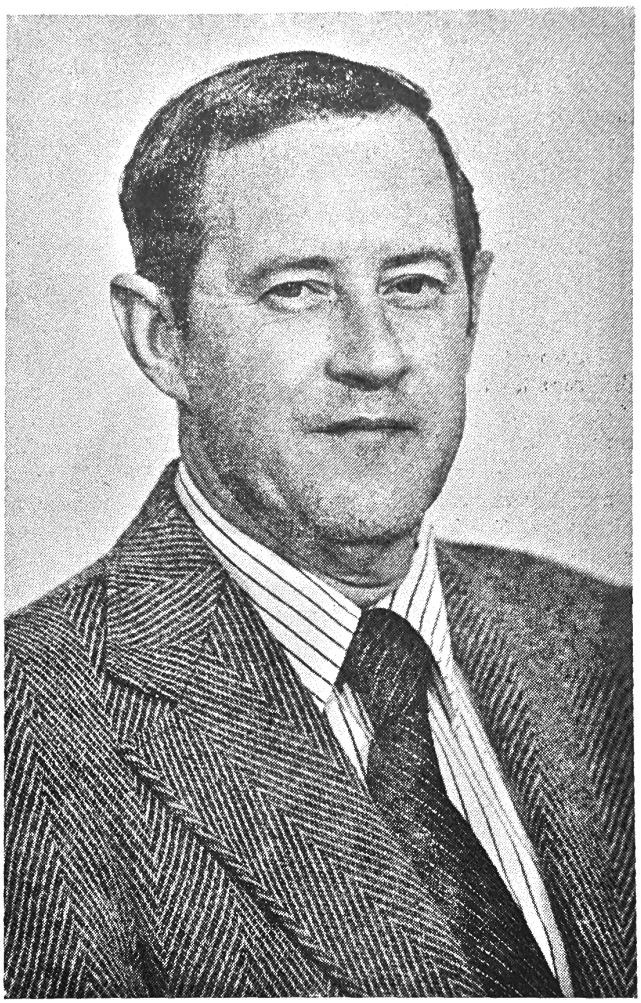
NEW PRESIDENT OF THE TENNESSEE ACADEMY OF SCIENCE FOR 1980

Clay Morris Chandler was born in McKenzie, Tennessee in 1927; his parents are Annie Lou Morris and H. Clay Chandler of Milan, Tennessee. His basic education was received in the Tennessee public schools of Martin, McKenzie, and Milan High School (diploma, 1945). As a freshman he attended Clemson A & M College, and later received the B.S. degree (chemistry) from Bethel College in 1950. His graduate work was done at Murray State College, The University of Mississippi, and George Peabody College where he received the M.A. degree in 1954. The Ph.D. (zoology) was conferred in 1965 by Indiana University at Bloomington; his dissertation concerned the ecology of four species of planarians. Postgraduate credit was earned at Arizona State University in a desert biology institute.

Dr. Chandler served in the U.S. Army from 1945 to 1947, and in the U.S. Air Force in 1951. He was employed briefly as a laboratory technician in ordnance at Milan Arsenal, but most of his career has been in teaching: Carroll County, Tennessee schools, Milan High School, West Georgia College (Assistant Prof. of Biol.), Indiana University (Graduate Teaching Associate, Lecturer in Zoology, Eigenmann Fellow), Bethel College (Prof. of Biol. and Chairman of Div. of Sciences), Reelfoot Lake Biological Station (limnology), Tech Aqua Biological Station (limnology and freshwater invertebrates), and Middle Tennessee State University (since 1970) where he is Prof. of Biology. At M.T.S.U. Dr. Chandler has served on several university and departmental committees, was nominated three times for outstanding teacher, is a member of the Honors faculty and Graduate faculty, and teaches general biology, ecology, and limnology.

Dr. Chandler has been a member of the Tennessee Academy of Science since 1965 and has served the Academy as section chairman, member of the Executive Committee, chairman of membership committee, and program chairman for the 1979 annual meeting. He was elected a Fellow of the Academy in 1971 and is a contributor to the Journal of T.A.S. He also holds membership in the American Association for the Advancement of Science, American Society of Limnology and Oceanography, Association of Southeastern Biologists, North American Benthological Society, and Sigma Xi. Dr. Chandler's principal research concerns systematics and ecology of freshwater planarians, and



with Dr. Julian T. Darlington state wide planarian surveys of Arkansas, New Mexico, and Tennessee have been conducted. Dr. Chandler is currently a member of the Tennessee 208 Advisory Committee for Water Quality Control.

Dr. Chandler is a member of First United Methodist Church in Murfreesboro. He married Jimmie Elizabeth Cary in 1956 and they have two sons: Morris, a student at M.T.S.U., and David, an eighth grade student at Central Middle School in Murfreesboro.

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A REPORT ON THE BIOLOGICAL FIELD STATIONS OF TENNESSEE

WINTFRED L. SMITH
University of Tennessee at Martin
Martin, Tennessee 38238

INTRODUCTION

Information for this report has been provided by Dr. Robert E. Martin, Director, Tech Aqua Biological Station, Tennessee Technological University, Dr. Neil A. Miller, Director, Edward J. Meeman Biological Field Station, Memphis State University, and Dr. Robert A. Carlton, Director, A. D. Oxley Biological Field Station, Lambuth College. Specific inquiries regarding course offerings, registration, fees, etc., should be addressed to the appropriate director.

TECH AQUA BIOLOGICAL STATION
DR. ROBERT E. MARTIN, DIRECTOR
Tennessee Technological University
Cookeville, Tennessee 38501

During the summer of 1979, 58 students from 17 different institutions enrolled in courses offered at Tech Aqua during the summer session. The first summer term, 1980, will be held from June 12 to July 17, with the following courses to be offered: Local Flora, Freshwater Invertebrates, Ichthyology, Freshwater Algae, Ornithology, Seminar, and Field Investigations. The second summer term, 1980, will be held from July 19 to August 20 with Limnology, Ecosystem Analysis, Herpetology, Aquatic Microinvertebrates, Biology of Chironomids, Seminar, and Field Investigations to be offered.

The Tech Aqua Biological Station continues to serve as a research base for several graduate students from TTU and is used by field trip groups from several consortium institutions and by some non-consortium institutions.

E. J. MEEMAN BIOLOGICAL FIELD STATION
DR. NEIL A. MILLER, DIRECTOR
Memphis State University
Memphis, Tennessee 38152

A pre-summer session will be held at the E. J. Meeman Field Station from the second week in May, 1980, to the first week in June, 1980, during which the course Field Techniques in Ecology will be offered. This course will carry 4 hours of undergraduate or graduate credit. Several research projects will continue to make use of the station and include a tree improvement project, studies of the activity patterns of raccoons, cardiac and ventilatory activity in amphibians and reptiles, natural selection in the field mouse, and insects.

A. D. Oxley Biological Field Station
Dr. Robert A. Carlton, Director
Lambuth College
Jackson, Tennessee 38301

Although no courses have been planned to be taught entirely at the station during the summer of 1980, several courses taught on the campus of Lambuth College will continue to utilize facilities of the station for field trips.

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THE INTERNATIONAL YEAR OF THE CHILD

GENERAL SESSION
TENNESSEE ACADEMY OF SCIENCES
88TH GENERAL MEETING

FETAL RESEARCH: OPENING THE BLACK BOX

MILDRED T. STAHLMAN,
Vanderbilt University
Nashville, Tennessee

The development of Newborn Intensive Care Units worldwide over the last 18 years, with management based on increased physiological, biochemical and pathological understanding of newborn disease processes, has amply demonstrated that most, if not all, neonatol acute illness has antecedent events during intrauterine, intrapartum, or early postpartum life. Prevention of neonatal problems and lowering of perinatal mortality will depend on the opening of the *in utero* "black box."

The fetus *in utero* has been one of the most difficult of all research subjects to approach. Fetal animal research has been hampered, since preservation of *in utero* conditions is difficult with acute preparations, and the fetal surgery necessary for chronic preparations has been regarded technically as a near impossible tour de force. In humans, fetal research has demanded either non-invasive techniques, or only those procedures whose fetal risk is minimal.

Many examples of new and innovative approaches toward fetal diagnosis and understanding have occurred in the past 30 years. Beginning with the careful acute studies in fetal sheep and goats by Sir Joseph Barcroft in the 1930's, which were subsequently expanded upon with chronic *in utero* preparations by Dr. Donald Barron, basic physiology of the mammalian fetus is now becoming well understood. A wide variety of studies are now being carried out in many laboratories using elaborately chronically instrumented fetuses.

A New Zealand obstetrician, Lily, who was interested in Rh sensitization, began to invade the human uterus to obtain amniotic fluid in the early 1960's. This technique has been extended to provide antenatal diagnosis for a wide variety of genetic diseases, including chromosomal abnormalities, many inborn errors of metabolism, and the assessment of lung maturity. The development of fetal heart rate monitoring by Larks, Hon, and others, has provided a means of assessing fetal well being, both during an antepartum stress challenge, and during labor itself. This has been augmented by analysis of fetal scalp blood, first intermittently, and now with continuous blood gas and pH monitors.

Many other examples of fetal research providing directly applicable information for the prevention of fetal and neonatal distress can be cited. This approach offers the most direct route toward eventual lowering of perinatal morbidity and mortality.

THE LEAD PROBLEM REVISITED

RUDOLPH E. JACKSON
Meharry Medical College
Nashville, Tennessee

The toxic effects of lead, a useful metal ubiquitous in man's environment have been known for some time. The occupational hazards of lead poisoning were well established by the early 19th century, but lead poisoning in children caused by paint ingestion was not reported until the turn of the century. In 1971 Congress passed the Lead-Based Paint Poisoning Prevention Act which authorized Federal funds to assist communities in developing and implementing screening and treatment programs and to eliminate the cause of lead-based paint poisoning. Much has happened since the passage of this Act. There has been a decrease in the incidence of lead poisoning and undue lead absorption from lead-based paint. Attention has now been shifted to other sources of lead in the environment. A discussion of these sources and the possible occurrence of subtle symptomatology in the absence of overt clinical toxicity can be very helpful.

A LOOK AT THE TROUBLED ADOLESCENT

HAROLD W. JORDAN
Meharry Medical College
Nashville, Tennessee

During the years that I served as Tennessee Commissioner of Mental Health and Mental Retardation, I had the opportunity of viewing from a statewide prospective, the status of the troubled adolescent.

There are many adolescents who are really lost to care because they do not specifically have problems which are in the domain of any one discipline or agent. They may have correctional, family, adjustment, mental health, academic, or other problems. Any one adolescent may have a combination of one or several of these problems and no one agency can be helpful to him.

During the time that I was to vacate my position as Commissioner, several of us began to discuss this situation with the idea that perhaps several state and local agencies might coalesce their efforts to establish a center for the troubled adolescent. Said center would not be under the aegis of any one agency or discipline but would be under the aegis of a non-profit corporation, the state government, or city or county government. In that capacity, it could be staffed by non-professional personnel who could be supported by mental health and mental retardation personnel, public health, correctional, human services, and educational personnel. Such an agency could serve the function of being a hostel for care, habilitation and rehabilitation of troubled adolescents who might require such residential care for one, two, three, or perhaps all of their adolescent years. The adolescent could be located in his or her home area such that their family could see and visit often and the adolescent could maintain close contact with the family, school and community. In view of the fact that he or she will not be living at home or necessarily attending a regular school, the adjustment problems that they may have at home, school, and in other areas of the community could be overcome.

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PROCEEDINGS OF THE TENNESSEE ACADEMY OF SCIENCE 1979

DIANE R. NELSON, *Secretary*
East Tennessee State University

EXECUTIVE COMMITTEE MEETING
APRIL, 1979

The Executive Committee Meeting of the Tennessee Academy of Science was called to order by the President at 7:00 p.m. C.S.T. in the Walnut Room of the Henry H. Hill Student Center, George Peabody College, Nashville on April 20, 1979. Members present were James D. Caponetti, President; Clay

M. Chandler, President- Elect; Robert E. Martin, Past-President; Diane R. Nelson, Secretary; Robert L. Wilson, Treasurer; Gus Tomlinson, Journal Editor; Richard J. Raridon, Director of the Collegiate Division; William N. Pafford, Director of the Junior Academy; Gordon Morris, S. K. Ballal, and B. R. Jennings, Members-at-large; Roger Bynum, State Department of Education.

The President ruled that smoking would not be permitted during the meeting.

The Minutes of the November, 1978, Executive Committee Meeting and the Annual Business Meeting were published in the April, 1979, issue of the Journal. They were approved as printed without change by a motion passed unanimously.

The Editor, Gus Tomlinson, presented the following report: "A complete report on 1978 activities, including a list of manuscripts received, published and rejected for the year, was given at the November meeting and published in the JTAS in April, 1979. These data will not be repeated for this meeting. Instead, this report represents an updating of the November data plus business notes and plans for the coming year.

The January 1979 issue, which included ten scientific manuscripts plus TAS news announcements, was published on schedule and mailed to all subscribers. The Junior Academy of Science Recognition Program for 1979, the death of Dr. Dicus, former President of TAS, and a reminder of the $10 page charge for contributors to JTAS were highlighted in the news and events section.

The April issue, which is already in the hands of subscribers, features the new President of TAS, a report of the biological field stations of Tennessee, highlights of the major addresses at the general session of the November 1979 annual meeting and a full page announcement of the TAS, Collegiate Division, Regional Meetings which are being held during April. The issue also includes the annual proceedings of TAS, abstracts of presentations at the annual November meeting, and one regular scientific manuscript. It should be noted that regular, annual inclusions are now taking essentially all of the page space for the April issue which is beginning to result in some backlog of manuscripts. It may be, however, that the $10 page assessment will reduce the number of manuscripts which are submitted. This factor cannot be assessed yet. The usual inclusion in this issue of outstanding high school teachers in districts across the state could not be done his time due to fact that selections have not been made.

On the subject of backcopies of JTAS *again*, the National Technical Information Service (NTIS), who so fervently sought photocopy rights from TAS and many other agencies last year, discontinued their attempt to provide such a service as of January 1, 1979. This announcement was followed by an offer from the Copyright Clearance Center, Inc. to serve as a "Broker" for TAS on photocopy rights for JTAS. The Editor is seeking advice on this matter and requests that executive committee members give some thought to the offer prior to the spring meeting in April.

This year, as is the case every year, many scientists, technicians, and institutions have shared their time and/or resources to aid the TAS in publication of its Journal. The secretarial, clerical and technical costs which have been charged to the Academy during the year average $274 per month. Every effort has been made and will continue to be made to hold costs to a minimum to TAS for publication of JTAS. The Editor wishes to thank all of those who have contributed to the publication of JTAS during the year, especially the sectional editors and other reviewers of manuscripts whose assistance are absolutely essential to the process.

In conclusion, 1979 promises to be a good year if receipt of new manuscripts is any indicator. Twenty-five new manuscripts have already been received since the November meeting. If Spring and/or Summer fever does not unduly affect research and writing efforts, the grand total of new manuscripts by the next report should be large indeed."

It was noted that the Copright Clearance Center, Inc., will only handle two years of backcopies of JTAS. The problem of handling requests for individual reprints remains. Dr. Chandler stated that MTSU has a full set of JTAS and he agreed to check with the librarian about processing requests at minimum cost. A note could then be placed in the inside cover regarding charges and procedures for obtaining photocopies.

Suggestions for handling page charges were discussed. The bill is to be sent with page proofs. Corrected copies must be returned with payment or paper will not be published. Payment will be sent by the Editor to the Treasurer. A motion to approve this method of handling page charges was passed. If the increase in manuscripts continues after page charges are initiated, an increase in the number of pages is preferred to an increase in the number of issues.

Sectional Editors are currently elected at the annual meeting, however, their function may not be clearly understood by the members. A memorandum should be sent to the Sectional Chairpersons. Section Editors should have a pre-conference meeting with the Editor to discuss duties and responsibilities. Large sections may need two Sectional Editors. The Sectional Editor receives JTAS manuscripts for publication, distributes them for review, and returns refereed manuscripts to the Editor with recommendations for dispensation. A motion was approved for the Editor to appoint sub-editors for the journal. Other suggestions will be presented to the membership at the November meeting.

The Editor's report was accepted.

The Director of the Visiting Scientists Program, Paul Wishart, was not present but submitted copies of last year's report and the following report:

"As of April 15, 55 visits have been requested by the public schools in Tennessee. Approximately two-thirds of these visits have been completed. The program is operating at the same general level as that of 1977-78. Additional copies of the Annual Report are included for your review.

Items for consideration in the 1979-80 budget include:

1. Increasing the mileage allowance from 15¢ per mile to 17¢ per mile.
2. Determining a policy regarding the *responsibility* of the Visiting Scientist Program for damaged or broken equipment supplied by the scientist.
3. Establishing the legal responsibility (if any) of the Academy for any kind of accident to the scientist or to others while on an official visit for the Visiting Scientists Program.

It is recommended that the number of trips scheduled be adjusted to approximately 55 in order to accommodate to the inflationary factors affecting the operation of the program.

Direct costs to the Department of Curriculum and Instruction are included under Operating Costs."

The Executive Committee agreed that the Academy and the Visiting Scientist Program are not responsible for damaged or broken equipment or for accidents while on an official visit for the V.S.P. A statement to this effect should be added to the advertising and the roster and a letter written to the participants. The need for completion of the roster by August 1 was stressed. This could be used for *in-service* programs in the spring if the roster is available then. The program should be promoted in schools not currently using the V.S.P.

The Director's report was accepted.

The Director of the Collegiate Division, Richard J. Raridon, presented no report because the spring meetings are currently being held.

As delegate to the Association of Academies of Science and to Section X of AAAS, Richard J. Raridon presented the following report:

"I represented TAS at the AAAS Meeting in Houston, TX, on Jan. 3-8, 1979. I attended the Section X Committee Meeting at which the main topic was discussion of possible symposia to be sponsored at next year's AAAS meeting. I chaired the Association of Academies of Science session entitled "How Academies of Science Can Communicate Science to the General Public." The papers presented there will be included in the AAS Proceedings which you will receive this spring. A possible topic at next year's meeting may be IRS non-profit status, publication advertising, etc., as they relate to academy operations. At the AAS business meeting which followed, Arthur Livermore, Director of the AAAS Office of Education, discussed the AAAS

grants to academies to be used for research by secondary school students. Through June of 1979 money will be available as it has been in the past, simply on request. From now on, however, each academy must submit a proposal asking for funds in advance. These proposals would be due in Dr. Livermore's office by June 1 and would be acted upon by July 1. There is no limit to the amount of money that can be requested but the total amount to be distributed by AAAS only amounts to $12,000. I have attached an outline for a proposal which needs to be prepared this spring. If we receive a grant, then we will need to publicize it in order to spend it. The AAS delegates voted favorably on several changes in the by-laws. One of these would change the name of the organization to National Association of Academies of Science (NAAS). The office of secretary-treasurer was split. The new officers are: President, E. L. Wisman, Virginia; president-elect, R. W. Hanson, Iowa; secretary, L. N. Bolen, Mississippi; treasurer, A. E. Hughes, Texas; archivist, L. E. Elfner, Ohio; and Junior Academy director, F. W. Starr, Iowa. I have one more year to serve as NAAS representative to the AAAS Council."

A motion to accept the report was passed.

The Director of the Junior Academy, William N. Pafford, presented the following report:

"During 1977-78 total expenditures of the Junior Academy were $2,167.63. 600 copies of the *Handbook and Transactions* were published; copies were forwarded to each high school in Tennessee, to each student selected to present a paper at the annual meeting, to members of the TAS Executive Committee, and to selected members of the Tennessee State Department of Education.

We are in the process of finalizing arrangements for the spring meeting of the Junior Academy which is scheduled for April 20 at Peabody College. Members of the Executive Committee are invited to attend, as are all members of the Academy. Papers will be presented during the times of 9:30-11:30 AM and 1:00-3:00 PM. The meeting will be held in Mayborn 105. We are indebted to Gus Tomlinson for working out arrangements with the Peabody administration.

A total of seventeen (17) high school students have been invited to present their papers. We are able to reimburse participants for a portion of their expenses.

We were able to reduce expenses last year and return a considerable sum of money to the TAS treasury. This reduction was possible for several reasons, but a major factor was publication of the *Handbook* by the East Tennessee State University Press at a considerably lower cost than would have been possible by local printing companies. We hope to utilize services of the ETSU Press to an even greater extent in the future.

We have invited 17 students to present papers. A total of 34 papers were received. These papers came from 9 schools, with 10 teachers being involved. The papers were of significantly higher quality than in recent years.

I have proposed a budget of $3,000. for the 1979-80 academic year, the same as the 1978-79 budget. We hope to increase participant support significantly both this year and next. We plan to pay participants higher rates for mileage and to provide a greater portion of motel expenses than in the past.

In the event we have funds remaining near the end of the year, I would like to request that I be authorized to pay all or part of the expenses of the student rated highest at the spring meeting to attend the National Junior Academies of Science meeting. I have been assured that our top student would be given a place on the program and could present his/her paper.

In many cases the top student would probably not elect to attend. The amount of funds available, the location of the meeting, and various other factors would undoubtedly influence his/her decision. The meeting is in November, and it will be held in California this year. Unless we have a good deal of money left over—which I do not anticipate—it is unlikely that we will have a top participant who desires to attend.

If this Committee feels that such action is in order, however, I would like to extend an invitation of partial funding to the student submitting the top paper to present that paper at the National Meeting of Junior Academies of Science. In the event he/she declines, I would like to extend the invitation to the next most highly rated student, assuming we have several superior presentations.

The projected budget for 1979-80 is attached. I assume, however, that it will be possible to transfer funds from one category to another if necessary. Such a transfer will probably be required if a student is invited to attend the meeting of the National Junior Academies of Science as requested above."

The request to pay all or part of the expenses of the student rated highest at the Spring Meeting, or an alternate, to attend the National Junior Academies of Science meeting was approved. The meeting will be January 3-8. The amount available for travel expenses will depend on the funds remaining near the end of the year. It was noted that Tennessee students do well in national competitions.

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

The representative from the State Department of Education, Roger Bynum, reported that the Distinguished Teacher awards from the nine districts of the state had not yet been selected. He commended the work of the Junior Academy and the Visiting Scientist Program.

The Research Committee submitted a proposal for research funds for secondary school students for the academic year 1979-80. The report, as edited and corrected by the Executive Committee is as follows:

INTRODUCTION

The Tennessee Academy of Science, with a membership of approximately 800, has now been in existence for 66 years. Its membership is exceedingly diverse, including teachers of science in the different colleges and universities of the state, high school science teachers, industrial scientists, and representatives of agencies of the state.

Within recent years, the annual meetings have invariably included a general session devoted to some timely topic of general interest (e.g. energy, environmental toxins). There are sections devoted to Botany, Chemistry, Geology-Geography, Mathematics, Medical Sciences Physics-Astronomy, Teaching of Science and Mathematics, Engineering and Zoology. Two of these, namely Medical Sciences and Zoology, have been sufficiently large as to justify two concurrent sessions of paper presentation at the meetings.

The Academy has a Collegiate Division, which generally holds its annual meeting on the Saturday following the Friday meeting of the Academy proper. Its program consists of the presentation of research reports by college undergraduates.

The Academy has a Visiting Scientist Program. Approximately 100 scientists are listed on its roster of speakers, who, upon request give talks and demonstrations in the field of their specialization before high school science groups.

The Academy also sponsors the Tennessee Junior Academy of Science for high school students. Papers submitted by these students are read by a committee of judges, and the authors of a number of these considered especially meritorious are invited to attend and present their work at an annual meeting. Some funding is available to be applied to transportation expenses and a complimentary lunch. Of the papers presented, a small number of the superior ones are published by the Junior Academy in its own annual publications.

Recognizing that the excellence of a high school student's work in a scientific field is frequently greatly enhanced by a devoted and inspiring teacher, the Academy has for a number of years given Outstanding Teacher Awards, one teacher being selected for this honor each year from each of the 9 development districts of the state.

PAST HISTORY OF RESEARCH GRANTS

The grant-in-aid for research has been administered through the Research Committee of the Academy. This is a standing committee of the Academy which is appointed by the presi-

dent. The members of the committee are generally selected from the same geographical area, preferably from the same city in order to maintain close contacts and frequent meetings to facilitate the decision making process. The Research Committee has been responsible for publicizing and receiving applications, evaluating and making awards for research grants. The committee has used Journal of the Tennessee Academy of Science, Visiting Scientist Program, Science Association of Tennessee newsletter, and the Tennessee Teacher as publicizing media in addition to letters sent to science teachers in secondary schools.

A summary of the past five years is given below: In 1974, the committee contacted all high schools of Tennessee by letter informing science teachers of the funds available. Due to these efforts, eight requests for grants totaling $1,685 were received. Out of these eight applications, four were approved for a total of $340. Unsuccessful applicants were informed as to the reason why they were not supported, and were encouraged to reapply at a later date. During 1975, six awards for a total of $443 were made. Two grants for a total of $200 were made for the year 1976. In the year 1977, a total of ten proposals were received of which seven were funded for $425. The average award for the past four years has been $74 per approved project and an average of *five* applications per year have been funded.

The program has been reasonably effective as evidenced by the number of requests for awards. One of the grant recipients, Mr. W. C. Snyder, received funds toward his work on new antibiotics from fungi. He was the division grand prize winner for the Mid-South Science and Engineering Fair in Memphis in 1975, won first place in the American Medical Association category at the International Science and Engineering Fair in Oklahoma City, Oklahoma, and was invited by the Board of Trustees of the American Medical Association to take part in the opening ceremonies of their 1975 annual convention in Atlantic City.

BUDGET AND ADMINISTRATION OF GRANT

In order to fund a small number of secondary school students' research projects, $500 is requested for this purpose. The grant year would run from July 1, 1979 to June 30, 1980. All grant applications from secondary school students would be reviewed by the TAS Research Committee which is chaired by Dr. Prem Kahlon, Biology Department, Tennessee State University, Nashville, Tennessee. Other committee members are Drs. Fred Wolf (Vanderbilt), Henry Moses (Meharry), and T. E. Snazelle (UTN).

Upon approval of the grant, the availability of grant money will be publicized in the Journal of the Tennessee Academy of Science. The notice will state that grant applications should be submitted as early as possible to Dr. Prem Kahlon, Biology Department, Tennessee State University, Nashville, Tennessee 37203.

The application should state clearly the objective of the student's project. Furthermore, the request should contain a detailed list of materials needed with justification for their purchase and an estimated cost for each item requested. No funds will be approved for travel or per diem. Approval for the project must be obtained from the student's science teacher. The student's proposal should state whether he/she will report the findings of the research in a science fair project or at a meeting of the Junior Tennessee Academy of Science.

Upon receipt of the students' grant applications, they will be reviewed by the TAS Research Committee. The average award for a deserving proposal will be $75 more or less. The recommendations of the Research Committee will then be forwarded to the Executive Committee of the Academy for approval, following which Dr. Robert Lake Wilson, Treasurer of the Tennessee Academy of Science, will submit a check to the successful applicant.

At the end of the grant year, a report will be sent to AAAS summarizing the disposition of the funds and an evaluation of the success of the program.

The proposal was approved by the Executive Committee and forwarded to AAAS for consideration.

Dr. Clay Chandler presented a progress report on the arrangements for the fall meeting at Meharry Medical College. The suggested theme is "The Year of the Child."

There were no reports from the other committees.

The report of the Treasurer, Robert L. Wilson, was published in the April, 1979, issue of the Journal.

The Treasurer presented a handout on the budget for 1979-80 for consideration by the Executive Committee. A motion was passed to adopt the following budget:

1. President's Office		$ 100.00
2. Secretary's Office		400.00
3. Editor's Office		3300.00
4. Treasurer's Office		1700.00
5. Dues to AAAS		573.00
6. Printing-Mailing Journal		9000.00
7. AAS Conference		100.00
8. Annual Meetings Expense		600.00
9. Programs of the Academy		
Collegiate Division	$1500.00	
Visiting Scientists	3170.00	
Junior Academy	3000.00	
Sumer Scholarships	1000.00	
		8670.00
		$24443.00
Projected Income		
Tennessee Department Education		15000.00
Membership Dues		6000.00
Journal Subscriptions		1850.00
AAAS Grant		500.00
Journal Sales and Gifts		100.00
		$23450.00

A motion was passed to have the Treasurer investigate money management of the TAS savings account. A motion was passed to pay 17¢/mile for the Visiting Scientist Program. A motion was passed to recommend the following dues structure to the membership at the annual meeting: Regular Membership = $10; teachers below the college level, students, and emeritus members = $5; sustaining = $20; patron or industrial membership = $100 minimum; life membership = $150. A motion was passed to set the exhibitor's fee at $75 for the fall meeting.

OLD BUSINESS—None

NEW BUSINESS—Future meetings will be held at Meharry Medical College in 1979 and ORNL in 1980. UT-Martin will extend an invitation for 1982. Invitations will be solicited from Austin Peay for 1981 and Volunteer State for 1983.

Resolutions approved by the AAAS Council will be presented to the membership at the annual meeting.

The meeting was adjourned at 10:40 p.m. C.S.T.

EXECUTIVE COMMITTEE MEETING

NOVEMBER, 1979

The Executive Committee Meeting of the Tennessee Academy of Science was called to order by the President at 7:00 p.m. C.S.T. in the El Greco Room of the Sheraton Hotel, Nashville on November 15, 1979. Members present were James D. Caponetti, President; Clay M. Chandler, President-Elect; Robert E. Martin, Past-President; Diane R. Nelson, Secretary; Robert L. Wilson, Treasurer; Gus Tomlinson, Journal Editor; Richard J. Raridon, Director of the Collegiate Division; William N. Pafford, Director of the Junior Academy; A. Paul Wishart, Director of the Visiting Scientists Program; Gordon Morris, S. K. Ballal, and B. R. Jennings, Members-at-large; Roger Bynum, State Department of Education; Henry A. Moses, Chairman of the Local Arrangements Committee.

The President ruled that smoking would not be permitted during the meeting.

Dr. Henry A. Moses, Chairman of the Local Arrangements Committee, reported on the preparations for the annual meeting. Registration packets were distributed to the members of the Executive Committee, and arrangements for meeting rooms, exhibitors, registration, and the banquet were discussed. President Caponetti and President-Elect Chandler expressed the gratitude of the Academy to Dr. Moses and Meharry Medical College for hosting the annual meeting.

The Secretary, Diane R. Nelson, had mailed printed copies of the Minutes of the April, 1979, Executive Committee Meeting. A motion to accept the minutes was made and seconded. Dr. Chandler reported that the library at Middle Tennessee State University will handle requests for xeroxing reprints of the *Journal* at minimum cost. The minutes were unanimously approved as printed.

The Treasurer, Robert L. Wilson, submitted an audited report which appears elsewhere in these proceedings along with the report of the Auditor. Both reports were accepted by a motion passed unanimously.

The Editor, Gus Tomlinson, presented the following report:

"Since the annual meeting in November of 1978, four issues of JTAS have been published. Each issue was published and mailed on schedule during the year. In addition to the regular, annual inclusions such as proceedings, highlights of the general session addresses, Tennessee field stations reports, news events, etc., volume fifty four (1979) contains 33 regular manuscripts. The breakdown by subject area for 1979 inclusions in JTAS is as follows:

Zoology	10
Botany	9
Chemistry	3
Geology	3
Medical Sciences	2
Environmental Science	1
General Science	1
Science Education	1
Mathematics	1
Historical	1
PLUS	
General Session Addresses (7)	7
TN Field Stations Reports	2
Abstracts (Sets)	2
News Events	4
Proceedings	1
Index	1

The January 1980 issue is in page proof form. It will be a broad spectrum issue with 11 manuscripts representing 8 subject areas tentatively scheduled for inclusion. Fourteen manuscripts are currently in galley proof form and are being proofed by the Editor. These manuscripts are scheduled to be published in April and/or July (Space limitation in April after inclusion of all the proceedings is severe and allows for few regular manuscripts). Seventeen additional manuscripts are still in review or author revision or editorial modification.

Forty nine new manuscripts were received during 1979. This number compares with 52 in 1978 and 41 in 1977. Fifteen (of the grand total of 17 indicated above) were received during the summer and are still in the review or author revision process. Review and author revision are difficult to accomplish each summer due to the fact that many people are difficult to reach by mail or telephone during this time. Two manuscripts were rejected for publication during the year and three others were withdrawn.

Total operating costs of the Editor's office to the Academy remained substantially the same in 1979 as compared to 1978 ($276 per month in 1979 and $271 per month for 1978). Estimated costs for 1980, with minimal part-time office and clerical assistance being employed, will be in the range of $280-$285 per month. JTAS printing costs through Curley Printing Company are paid by the Treasurer and such costs will be reported via the Treasurer's Report.

Since the National Technical Information Service withdrew its commitment to provide photocopies of reprints to individual authors, a new solution to this infrequent but persistent problem was sought. Through Dr. Clay Chandler's efforts, the Middle Tennessee State University Library has agreed to handle such occasional requests where back issues of the Journal are not available. Actually, no such requests have been received to date but the procedure has been established to handle the situation when it does arise.

JTAS Summary for 1979

1. Forty nine new manuscripts were received during the year. Fifteen of these are still in review and/or author revision.
2. Thirty three manuscripts were published during the year with an additional 11 in page proof form for the January issue.
3. Zoology and Botany manuscripts were the most frequently received and published but manuscripts in 8 other subject areas were also included during the year.
4. Back issues up to two years old are still available in the Editor's office for $3. per copy. Photocopies of reprints are available through the MTSU Library in Murfreesboro. Libraries or others who may be interested in obtaining whole JTAS back issue sets or major portions thereof may purchase microfilm reels for all issues dating back to 1926 from AMS Press Inc., 56Y E. 13th Street, New York, N.Y."

Another publishing company has expressed interest in publishing JTAS but has not yet submitted a quotation. The Editor contacted the current publisher, Curley Printing Company, to review their cost. The company reported that their costs are substantially higher now due to inflation, but they have agreed to hold the cost until next fall when an increase of 20-25% will be requested.

The Editor's report was accepted.

The Director of the Visiting Scientists Program, Paul Wishart submitted the following report:

"The 1978-79 roster of scientists, consisting of 105 individuals, was prepared during the spring and summer of 1978. Letters were written to the scientists listed in the previous year's roster to inquire if they desired to continue to serve in the program. Participants were requested to make appropriate additions or changes in the topics for their presentations. Application forms for new nominees were sent to each of the scientists in an effort to secure additional specialists from different academic fields from the various parts of the state. Approximately twenty-five new scientists were added to the official team as a result of the inquiry. After the required data for the new roster had been received, forms were sent out to all of the new prospects to obtain: 1) information as to the topics to be presented in the secondary schools and 2) relevant professional and personal data required to conduct the program. Follow-up letters were mailed during the fall to those who failed to respond to the first mail-out in order to complete the roster.

The 1978-79 roster was typed in two sections in order to make it possible for late responses to be included for the current academic year. More than 600 copies were prepared for distribution to teachers, supervisors, and scientists throughout the state. Geographic areas extending from Upper East Tennessee to the Memphis area are involved in the program with both rural and metropolitan secondary schools utilizing the services of our scientists.

In recent years a significant number of the schools have indicated a desire to have repeated visits from scientists representing one or more special academic areas, as for example: Biology or Geology. Arrangements are made for selected schools to schedule as many as four follow up visits if these requests for services are compatible with the curricular program of the school. Scientists also are encouraged to work with teachers in science inservice programs and to provide help to students engaged in research projects. Increasing costs for transportation have a limiting influence on the size of the VSP Educational effort. In addition, the unexpected closing of schools during inclement weather presents serious problems of rescheduling or cancellation of visits.

Scientists of the state continue to show their willingness to accept the very modest honoraria propided by the VSP in order to serve Tennessee's high school students and teachers. In 1979, 7—21612—Tenn. Acad. of Science—7 TR on 8 [illegible] the TAS Executive Committee recommended increasing the mileage allowance from $0.15 to $0.17 per mile for the use of private cars.

Evaluative comments from both the schools and the scientists indicate that the program provides a much needed service and is deserving of continuation in future years. Evaluation reports are used after each visit and the feed-back from the scientists, science teachers, principals, and students are most beneficial in improving the operation of all portions of the program.

Following are the special fields in science and science related areas that were included in the program for the current year:"

1. Astronomy
2. Biology and Ecology
3. Chemistry
4. Engineering
5. General Science
6. Geology, Geography, & Earth Science
7. Mathematics
8. Medicine and Pharmacy
9. Nutrition
10. Physics
11. Psychology
12. Textiles

SUMMARY
VISITING SCIENTIST PROGRAM
STATISTICAL SUMMARY

CONTACTS MADE	*1971-72*	*1972-73*	*1973-74*	*1974-75*	*1975-76*	*1976-77*	*1977-78*	*1978-79*
Number of Visits	60	66	60	42	61	61	80	71
Number of Students Contacted	9343	10234	8911	3502	3515	5776	5570	4691
Number of Teachers Contacted	268	249	214	148	181	321	204	153
Number of Classes Contacted	178	217	209	81	151	161	118	132
Mileage					3535	3625	2956	3447
Number of Scientists on Roster	99	83	96	90	128	104	104	104

The Director recommended that the roster be used for two years to save money. A supplement with additions and deletions will be mailed the second year. The Director's report was accepted.

The Director of the Collegiate Division, Richard J. Raridon, presented the following report:

"Three regional meetings of the Collegiate Division were held during the spring 1979. The Eastern Region met at Bryan College where 14 students presented papers. The Middle Region met at the University of the South where 24 students, 12 of them from Tennessee Tech, presented papers. The Western Region met at Union University where 23 students, 14 of them from Christian Brothers College, presented papers. Eight papers have been submitted for presentation at the 1979 fall meeting. The total expenses for 1979 have been $833.14."

The Collegiate Division will meet Saturday morning, November 17, 1979. Three papers will be presented in addition to the four listed in the program. The Director's report was accepted.

The Director of the Junior Academy, William N. Pafford, presented the following report:

"High School students submitted a total of 34 research papers to the Junior Academy of Science during 1978-79. A panel of readers selected the top 17 papers for presentation at the spring meeting, which was held at Peabody College on April 20, 1979.

A panel of judges was selected to evaluate the presentations. Members of the panel were Dean Arthur Cook, Peabody College; Dr. Clifford Hofwolt, Peabody College; and Ms. Jean Nicholson, Nashville Metro Public Schools. The five papers receiving the highest rating are being published in their entirety in the 1979 Junior Academy *Handbook and Transactions*. Abstracts of the other 12 papers presented will be published. All judges commented favorably on the high quality of the presentations.

The student who presented the top-rated paper was Mr. Wesley D. Allen, from Dickson County High School, Dickson, Tennessee. Mr. Allen's paper was entitled "Foam Flotation of Cu(II) With a Chelating Surfactant." An invitation has been extended to Mr. Allen to present his paper at the annual meeting of the American Junior Academy of Science, which is being held in San Francisco, California, January 3-6. Mr. Allen has accepted our invitation and will represent the Tennessee Junior Academy at that meeting.

The 1979 *Handbook and Transactions* is in press. Copies of the *Handbook* will be mailed to every high school in Tennessee, to members of the Executive Committee of TAS, and to all students who presented papers at the spring meeting. The *Handbook* is being published by the East Tennessee State University Press.

The spring meeting of the Junior Academy has been tentatively set for April 18 at Glencliff High School in Nashville.

Thanks are extended to readers, judges, and especially to Dr. Gus Tomlinson, who handled local arrangements for the 1979 spring meeting at Peabody College."

Dr. Caponetti set the Executive Committee spring meeting for Friday, April 18, 1980.

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

As delegate to the Association of Academies of Science and to Section X of AAAS, Richard J. Raridon stated that he will attend the AAAS meeting in San Francisco, January 3-8, 1980, and will report at the spring meeting. A motion to accept the report was passed, and Dr. Raridon was re-appointed as the TAS delegate to Section X of AAAS.

The representative from the State Department of Education, Roger Bynum, reported that two students in the Tennessee Junior Academy were also selected as Edison Scholars and received $500 scholarships. The nominations for Distinguished Teacher awards from the nine districts of the state were late last year but will be ready for 1979-80 by December 1, 1979. The report was accepted by a passed motion.

President Caponetti presented committee reports from the respective chairpersons as follows:

1. Auditing Committe. The Chairman, Myron S. McCay, sent the following report:

"Members of the Auditing Committee have inspected the records of the Treasurer for 1979 and have found them to be correct, complete and clearly recorded.

Again it is in order to commend the Treasurer for the clarity of the record of all receipts and expenditures, and for the thorough audit of these transactions by a local public accountant."

The Committee report was approved by a passed motion.

2. Fellows Committee. The Chairman, James X. Corgan, sent the following nominations for Fellows: Berlyn C. Moneymaker, Portland Fox, Robert A, Laurence. John Kinloch was added to the list of nominees.

A motion was passed to approve the four nominees as Fellows of the Academy and to present them to the membership at the annual Business Meeting.

3. Membership Committee. The Chairman, John W. Harris, sent the following report:

"Letters have been or will be sent to chairmen of the Departments (or equivalent Divisions) of Biology, Chemistry, Earth Sciences (or Geology), Physics, Mathematics (and/or Computer Science), and Engineering (separate departments where applicable) at 36 institutions.

Five TAS application forms were to be enclosed with each letter. As of November 16, 1979, approximately one-half of the letters had been mailed. It is anticipated that the remainder will be sent by December 15."

The Committee report was approved by a passed motion.

4. Necrology Committee. The Chairman, James G. Beasley, sent the following report:

"The Necrology Committee of the Tennessee Academy of Science regrets to report the passing of a long time, respected member of the Academy, Dr. Donald Caplenor, Associate Vice-President for Research and undergraduate studies at Tennessee Technological University.

Dr. Caplenor was a native of Carthage, Tennessee and a graduate of Vanderbilt University. He performed basic research on relic plant species in Fall Creek Gorge, Tennessee and served on the faculties of several Southeastern schools during the course of his professional career."

The Committee report was approved by a passed motion.

5. Nominating Committee. The Chairman, Robert E. Martin, submitted the following nominees for officers of the Academy:

"Dr. A. Paul Wishart, UT-Knoxville, President Elect; Dr. Diane Nelson, East Tennessee State University, Secretary; Dr. Robert Wilson, UT-Chattanooga, Treasurer."

A motion was passed to approve the three nominees for offices and present them to the membership at the annual Business Meeting. Dr. Wishart was authorized to appoint an assistant for the Visiting Scientists Program at his discretion.

6. Research Committee. The Chairman, Prem Kahlon, sent the following report:

"Summary of Activities:

1. Committee members were selected from one city to eliminate problems of communication. The committee consisted of four (4) members representing four (4) different institutions in Nashville.
2. Reviewed previous activities of the Research Committee and developed guidelines for application procedures and evaluation of Grant-in-Aid request.

3. Submitted a proposal to the office of Science Education, American Association for the Advancement of Science requesting $500.00 to support secondary school students science projects. Only a partial amount of $250.00 was received.
4. Availability of funds were publicized in the Academy Journal. Science teachers workshop held at Vanderbilt, personal contacts and letter-writing to interested teachers.
5. Only seven (7) applications with a total request of $320.00 were received through November 9, 1979.
6. The committee evaluated the seven requests and recommended the following applications for funding:

Bruce Saunders	Stewart County H/S	$40.00
Nadia Atkins	Stewart County H/S	$25.00
Kym Clevenger	Karns H/S	$40.00
Miles Waldron	Hawkins Junior H/S	$50.00

7. The three applications not recommended for funding at this time will be re-evaluated with the pool of applications that may be received in the next few weeks and the balance of $95.00 will be recommended for awards no later than December 30, 1980."

The committee report was approved by a passed motion.

7. Resolutions Committee. Report to be submitted at Business Meeting.

OLD BUSINESS

1. At the November 1978 Executive Committee meeting, a committee. consisting of Wintfred Smith, Roger Bynum, and B. R. Jennings, was established to develop guidelines for all scientific proposals to the Academy. No report was given at the April 1979 meeting. Dr. Caponetti received a recent letter from Wintfred Smith asking whether the committee should be re-established to work on the guidelines. Dr. B. R. Jennings proposed a central funding procedure for all grant requests to the Academy. Proposals are to be submitted to the Research Committee which will then make recommendations to the Executive Committee. The Executive Committee will approve the recommendations at its meetings twice a year. Proposals should follow a standard generalized format devised by the Research Committee. A motion to approve the proposal was approved.

2. The annual meeting has been confirmed for ORNL in 1980. A verbal invitation has been received from Austin Peay State University for 1981. The Chancellor of UT-Martin has issued an invitation for 1982. The invitation from Volunteer State has been accepted for 1983. An invitation for the 1984 meeting will be sought from UT-Knoxville.

3. The amendments to the Constitution and the AAAS Resolutions will be submitted to the general membership for approval at the Business Meeting.

NEW BUSINESS

1. Dues notices were declared First Class Mail by the Post Office, and therefore the mailing of the notice and program was more costly than anticipated this year. A ruling on a printed notice will be sought next year prior to the mailing.

2. The following letter from Dr. Robert Wilson was received by members of the Executive Committee:

"The 1979-80 *Directory and Handbook of the National Association of Academies of Science* indicates that almost half of the state academies have either an executive officer or an executive director. Three of the larger academies, Maryland (3000 members), Ohio (1800 members), and Wisconsin (1674 members), all have a salaried director. The question arises as to whether these groups have a salaried director because they are large or are they large because they have a salaried executive director?

I would like to present for your consideration the fact that if the Tennessee Academy of Science is to continue as a viable organization it must find new sources of support. This support could be provided in a number of ways:

1. Increased membership
2. Additional funding from the state
3. Support from the business community
4. Foundation and federal grants

I feel that a salaried executive director who would be able to visit each campus could increase the membership by several hundred. Other important activities of this position would be to lobby in Nashville for increased funding from the state, to make frequent contacts with the business community to request support for the Academy, and to submit grant proposals to private foundations and federal sources on a regular, on-going basis. It should also be a function of the position of the executive director to assist the editor in the preparation of the *Journal* as well as the writing of promotional material to enhance the image of the Academy. This office would also be in charge of the membership list.

Cost to the Academy for such a position would be about $8000 per year. Of this figure $6000 would be salary and $2000 for travel.

The funds could be secured in the following manner:

$1500—from the Editor's Office

$1500—from the Treasurer's Office

$5000—from the savings account

$8000

If the Academy continues in its present course, in a few years the dwindling assets of the Academy will be exhausted in an attempt to keep pace with inflation and rising printing costs."

Discussion was held on the suggestion made by Dr. Wilson. Instead of "Executive Director" which implies a permanent position and requires a constitutional change, the title "Consultant to the Executive Committee" was selected. Concern was expressed that the salary would deplete the savings account and that one year might not be sufficient time to evaluate the position. Alternate sources of funding from higher education institutions, industry, and the State were discussed. A motion was made and seconded to hire Libby Workman as "Consultant to the Executive Committee" from January 2, 1980, to the end of November, 1980, at a minimum of one-half time, for $6,000 salary and up to a maximum of $2000 for travel. Ms. Workman has had considerable experience with the Academy as Assistant to the Treasurer. She has also had experience with publications, grant proposals, and fund-raising. A roll call vote was requested on the question. Those in favor were Caponetti, Morris, Nelson, Pafford, Raridon, Wilson and Wishart. Those opposed were Bynum, Chandler, Jennings, Martin, and Tomlinson. Ballal abstained.

The motion carried: 7 for, 5 against, 1 abstention.

3. Dr. Raridon announced that exhibitors for the 1980 meeting at ORNL may be excluded due to space limitations at the lab. All individuals will have to pre-register so that radiation badges can be prepared for all visitors.

The meeting was adjourned at 11:15 p.m. C.S.T.