

PROCEEDINGS OF THE TENNESSEE ACADEMY OF SCIENCE 1976

JAMES D. CAPONETTI, Secretary
EXECUTIVE COMMITTEE MEETING
JANUARY, 1976

UNIVERSITY OF TENNESSEE, NASHVILLE

The Executive Committee Meeting of the Tennessee Academy of Science was called to order by the President at 7:30 p.m. C.S.T. in Room 320 of the main building of the University of Tennessee, Nashville, on January 30, 1976. Members present were John M. Mallette, President; Raymond L. Tanner, President-Elect; Albert L. Myers, Past-President; James D. Caponetti, Secretary; Robert L. Wilson, Treasurer; Gus Tomlinson, Journal Editor; Richard J. Raridon, Director of the Collegiate Division; Winfred L. Smith, Director of the Reelfoot Lake Program; A. Paul Wishart, Director of the Visiting Scientists Program; S. K. Ballal, Clay M. Chandler, and Myron S. McCay, Members-at-Large.

The Secretary, James D. Caponetti, had mailed printed copies of the Minutes of the November, 1975, Executive Committee Meeting and the Annual Business Meeting to each member of the Executive Committee. They were quickly accepted by a passed motion.

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

The Editor, Gus Tomlinson, submitted the following report: "A complete report on 1974-75 activities, including a list of manuscripts received, published, and rejected for the year, was given at the November meeting. These data will not be repeated in this report. Instead, this report represents an updating of the November report plus plans for operation during the 1976 year.

The January 1976 issue, which included the report of the Reelfoot Biological Station, twelve regular manuscripts, and TAS news events and announcements, has been published and mailed to all subscribers. The Junior Academy of Science Recognition Program for 1976, court action on the "New Monkey Law," National celebration of the Bicentennial, the 142nd meeting of AAAS for 1976, court action regarding dismissal of tenured instructors by colleges and universities, and state of air pollution in Tennessee were highlighted in the news and events section of the January issue. Continuing the economy measure of the last few years, a separate printing for the Director of the Reelfoot Biological Station has not been done. Instead, the Editor will share the regular back issues typically retained in the Editor's office with the Director of the Reelfoot Biological Station.

Since funding for the new Reelfoot Biological Station has been difficult to obtain, and since the Tech Aqua Biological Station and others are presently functional, the Editor suggests that this annual report would probably be more meaningful to Tennesseans if information regarding activities at any or all of the lakes which have Biological Stations, including Reelfoot, were included in this annual report. If the Executive Committee approves of this policy, the Editor will strive to obtain information of this nature for inclusion in the next January issue.

The April 1976 issue is already in preparation. It will include a biographical sketch of the new President of TAS, the proceedings for TAS during 1975, abstracts of manuscripts which were presented at the November meeting, plus as many regular scientific manuscripts as space will allow. Among the news events which the Editor hopes to cover in the April issue will be the announcement of the Outstanding Teacher Awards for Tennessee for 1976.

November and January were fairly good months with respect to receipt of new manuscripts for publication in JTAS. Six new manuscripts were received during this period. These manuscripts

will provide a modest backlog which will allow appropriate editorial review to precede publication.

The Editor's office has now completed the process of checking the microfilm which was prepared by AMS Press Incorporated in New York for all back issues of JTAS since 1926. The microfilm is complete through 1972. Journal copies since that time are being forwarded to AMS Press Incorporated in the hope that they can be included in the next microfilm to be made in the near future. In working through the miscellaneous back copies which have been retained at Vanderbilt and at Peabody over the years, a set of complimentary copies have been selected to be carried to the annual meeting in November to be distributed to TAS membership. You may recall that complimentary copies were made available at UT-Nashville in November of 1975. These copies were apparently very popular, since all of them were removed from the registration area at UT-Nashville.

The Editor solicits the aid of all TAS members in acquiring high quality manuscripts for publication in JTAS. News events which might be of interest to JTAS readers are also welcomed."

The Editor's request in paragraph three of the report, and, in turn, the whole report, were approved by a passed motion.

The Director of the Visiting Scientists Program, A. Paul Wishart, presented the following progress report:

"Approximately 100 scientists representing 21 colleges, universities, and research agencies (e.g., ERDA) throughout Tennessee were listed in the official 1975-76 Roster. Following is a statistical summary of activities for 1975-76 as of this date:

Visits requested	51
School classes visited	48
Students contacted	1,790
Teachers and staff contacted	52

The Director's report was accepted by a passed motion.

The Director of the Junior Academy, John H. Bailey, was absent from the meeting but had arranged with the Secretary to present the following report:

"1. The completion and mailing of the Tennessee Junior Academy of Science Handbook and Transactions for the 1974-1975 academic year has been completed and mailed to TJAS participants and participating schools.

2. Completion and mailing of TJAS Newsletters for 1975-1976 to public and private high school officials and science teachers in Tennessee.

3. Fifteen to twenty-five papers are to be selected for presentation at the TJAS spring meeting.

4. Approximately 100 requests for Cover Sheets have been received for participation in the 1975-1976 program. Other requests are anticipated prior to March.

5. The attached financial statement reflects some of the activities of the past year and project activities for the 1975-1976 school year. Energy problems and other conditions could conceivably effect further changes as the school year progresses. These will be handled as events unfold.

6. The completion of the 1975-1976 program will represent eleven years that I have served as Director of the Junior Academy.

7. To ETSU, the TAS Senior Academy, the State Department of Education, Vanderbilt University, and the high school science teachers we owe thanks for much untold help.

8. Following my retirement at ETSU, in 1972, I have received encouragement to continue with the Junior Academy program by Dr. William Pafford, Chairman, General Science and Science Education Department. Dr. Pafford has filled in effectively when I have been unable to participate.

9. Mrs. Jean Knox, General Science and Science Education Departmental secretary has done much to see that everything moved on schedule. Her help has been invaluable."

The Director's report was accepted by a passed motion.

The Director is also Chairman of the Distinguished Teacher Awards Committee and arranged to have the following persons nominated to receive awards for 1976:

"1. First District—Mrs. Barbara Wiseman, Biology Teacher, Kingsport Dobyns Bennett High School, Kingsport.

2. Second District—Mr. B. Lamar Orr, Earth Science Teacher, Farragut High School, Concord.

3. Third District—Mrs. Georgia Lamb, Biology Teacher, McMinn High School, Athens.

4. Fourth District—Mrs. Frances Mitchell, Elementary Science Teacher, Bel Aire Elementary School, Tullahoma.

5. Fifth District—Mr. Sammy Swor, Astronomy Teacher, McGavock High School, Nashville.

6. Sixth District—Mr. Hayes Blackwell, Biology Teacher, Hickman County Senior High School, Centerville.

7. Seventh District—Mr. Calvin Bondurant, Physical Sciences Teacher, Obion County Central High School, Troy.

8. Eighth District—Mrs. Shirley Leachman, Biology/Ecology Teacher, Carver High School, Memphis."

A motion was passed to present awards to the nominees.

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

"The Collegiate Division of TAS met on November 22, 1975, on the campus of the University of Tennessee at Nashville. Twelve papers were presented and about 50 students and faculty were in attendance. Two papers by students were presented at the Senior Academy sessions. Regional meetings are being planned for the spring of 1976."

The Director's report was accepted by a passed motion.

Our representative to the AAAS, Richard J. Raridon, could not yet submit a report because the AAAS meeting will take place next month.

The Director of the Reelfoot Lake Program, Winfred Smith, reported that he and his advisory committee were studying the feasibility of a Reelfoot Lake instructional program.

Since the Science Advisory Committee did not submit a report, President Mallette stated that he will telephone Dr. William Ellis for a status report.

OLD BUSINESS

1. The Secretary handed out printed copies of the final form of the Constitution and By-Laws containing all incorporated proposed amendments previously passed by the Executive Committee and the membership of the Academy. The Executive Committee now recommends that it study the approved revisions and determine if more are necessary. Proposed changes should be sent to the Secretary so that they may be presented to the membership by mail before the next annual meeting.

2. Several members of the Executive Committee expressed the opinion that the Academy should have an archivist. Drs. Clay and Tomlinson were requested to act as an ad hoc committee to nominate persons and to formulate the duties of the archivist.

NEW BUSINESS

1. A budget for the fiscal year 1976-1977 was formulated according to available money already in the Academy treasury and projected accounts receivable. The Treasurer's report contains the exact figures allotted to each Academy activity and function. A passed motion set the budget.

2. The Secretary was authorized to be in charge of contacting and arranging for exhibitors at the next annual meeting at the University of Tennessee, Chattanooga in cooperation with the chairman of the Local Arrangements Committee, Dr. Robert L. Wilson.

3. The Chairman of the Research Committee, Dr. R. G. Litchford, had requested in his annual report that the Academy honor Mr. William C. Snyder who is a senior at Christian Brothers

High School, Memphis. Mr. Snyder has won several national and local awards for his research projects. The Executive Committee voted to award Mr. Snyder a one year membership in the Academy plus a congratulatory letter from President Mallette.

The meeting was adjourned at 11:30 P.M. C.S.T.

EXECUTIVE COMMITTEE MEETING
NOVEMBER, 1976

The Executive Committee Meeting of the Tennessee Academy of Science was called to order by the President at 7:30 P.M. E.S.T. in the East Room of the Read House in Chattanooga, Tennessee, on November 18, 1976. Members present were John M. Mallette, President; Raymond L. Tanner, President-Elect; Albert L. Myers, Past-President; James D. Caponetti, Secretary; Robert L. Wilson, Treasurer; Gus Tomlinson, Journal Editor; William N. Pafford, Acting Director of the Junior Academy; Richard J. Raridon, Director of the Collegiate Division; Paul Wishart, Director of the Visiting Scientists Program; Winfred L. Smith, Director of the Reelfoot Lake Program; S. K. Ballal, Clay M. Chandler, and Myron S. McCay, Members-at-Large.

The Secretary, James D. Caponetti, had mailed printed copies of the Minutes of the January, 1976, Executive Committee Meeting. They were adopted without change by a motion passed unanimously.

The Editor, Gus Tomlinson, submitted the following report: "Four numbers of volume fifty-one have been published since the annual meeting last November. Each issue was published and mailed on schedule during the year. In addition to the regular annual inclusions in the Journal, i.e., proceedings, news items, awards, current events, abstracts, reports, index, etc., the 1976 volume contains thirty-seven regular manuscripts and the Reelfoot Lake Report. The breakdown by subject area for 1976 inclusions in the Journal is as follows:

Physics	2
Reelfoot Lake Report	1
Abstracts (sets)	2
Botany	6
Chemistry	4
Geology-Geography	3
Zoology	12
General Science	4
Proceedings	1
News Events (Sets)	4
Mathematics	2
Science Education	1
Agriculture	1
Index	1
Environmental	2

The January, 1977 issue of JTAS is in preparation. October 1, 1976, twenty-one manuscripts, fully marked and edited for publication in January or April 1977 issues, were placed in the possession of the printer. Galley proofs have already been sent to the authors. In addition to the manuscripts already scheduled for the January and April issues, five were accepted for publication, eight additional manuscripts are in author revision, and two manuscripts are being reviewed by sectional editors. One manuscript was rejected during 1976, after several attempts to get the manuscripts revised to meet objections of the Editor and Sectional Editors. The breakdown by subject area for the manuscripts to be included in the January, 1976 issue and the seventeen manuscripts which are in some phase of preparation is as follows:

Twenty-one Manuscripts in Galley Proof for January and April		Fifteen Manuscripts in Preparation	
Zoology	4	Zoology	8
Geology	3	General Science	1
Botany	6	Physics	1
Chemistry	1	Mathematics	1
Gen. Science	1	Med. Sci.	2
Physics	1	Elem. Science	1
Agri-Zoo-Bot.	1	Sci. Educ.	1
Med. Sci.	3		
Environmental	1		

The current backlog of fifteen manuscripts compares with seventeen in 1975, eighteen in 1974, and ten in 1973. With this

modest backlog of manuscripts, new manuscripts are still being published relatively soon after they are received. For example, forty-one new manuscripts (as compared to thirty-seven in 1975 and forty-one during 1974) were received during 1976. Twenty-six of these have already been published or are scheduled for publication in the January or April issues for 1977. Among the fifteen unpublished manuscripts which were received during the year, ten are still in review or under author revision. Thus, a well written manuscript of reasonable length has an excellent chance of being published within a few months after it has been submitted and accepted for publication in JTAS. This should encourage authors to avail themselves of JTAS for their publications. Hopefully, the increase of four manuscripts submitted for publication in JTAS in 1976 as compared to 1975 means greater interest and respect for JTAS. The Editor continues to welcome the assistance of the Executive Committee and all members of the Academy in soliciting new, short, well-written manuscripts for the Journal.

Editorial and clerical assistance continues to be done by students who work part-time at the expense of the Academy. Total operating costs of the Editor's Office to the Academy averaged \$256.38 per month in 1976 as compared to \$242.50 per month in 1975. Although the high student turnover rate makes this procedure difficult, it is still the least expensive operating procedure with respect to cost to the Academy. By continuing to utilize student help, yet recognizing administrative changes at Peabody College, it should be possible to hold monthly costs for 1976 to approximately \$265 per month (approximately \$3200 for 12 month year).

JTAS SUMMARY REPORT FOR 1976

1. A total of forty-one manuscripts was received during 1976, twenty-six of which have already been published or scheduled to be published in the January or April issues. Several others were only recently received. Thus, short, well-written manuscripts are being published within a few months after they are submitted for publication in JTAS.
2. All back issues of JTAS from 1926 are available from AMS Press, Inc., 56 East Thirteenth Street, New York, New York 10003 on microfilm.
3. Zoology, Botany and Math manuscripts continued to be received at approximately the same rate as usual during 1976. Manuscripts on Medical Science, Geology, and Science Education have increased slightly during the past year.
4. If it is possible to obtain the information, the editor would like to enlarge the Reelfoot Lake Biological Report to include work at other Tennessee lakes and/or biological stations.

NOTE: Members of the Academy and their colleagues are urged to support the Academy and its official publication by submitting their research in short, well-written manuscripts which can enhance the quality of the Journal of the Tennessee Academy of Science."

The Editor's report was accepted by a passed motion. The President then requested that the Director of the Reelfoot Lake Program, Wintfred L. Smith, collate information on work at other Tennessee biological stations for inclusion in the Journal of the Academy.

At this point, several members of the Executive Committee stated that the S.A.T. (Science Association of Tennessee) would like to have a joint annual meeting with the Academy within the next few years. President Mallette appointed a sub-committee composed of Raymond L. Tanner (Chairman), Gus Tomlinson, James D. Caponetti, and Paul Wishart to explore the possibility of a joint meeting with S.A.T. within three years. A report is expected from this sub-committee at the next Executive Committee meeting.

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 passed motion. Noting that the cash balance was high, a motion was passed to transfer \$1,000.00 from the Cash Balance to the Savings Account.

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

"Scientists listed in the current VSP Roster were contacted in the spring of 1976 to inquire if they wished to continue to serve in the program. They also were requested to make appropriate additions or changes in the topics for their presentations in the event they wished to continue as an official participant. Participating scientists also were sent nomination forms in an effort to secure additional specialists from different academic fields from the various geographic areas of Tennessee. More than thirty new scientists were added to the official VSP team during the current year.

After collection of all of the required data for the 1976-77 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. Due to vacation schedules, travel, and other factors, considerable difficulty was encountered in contacting all of the scientists in the first mail-out. Follow-up letters and phone calls were utilized during the summer and also during the fall of 1976 in order to complete the Roster on schedule.

The 1976 Roster, including 129 individuals, was typed in two sections in order to make it possible for late responses to be included for the current academic year. Approximately 550 copies were prepared for distribution to teachers, supervisors, and scientists throughout the state. Additional copies also were made available to various other groups in-state and out-of-state. Geographic areas extending from Upper East Tennessee to the Memphis area are involved in the program with rural, suburban, and inner city secondary schools utilizing the services of our scientists. We have found that a significant number of the schools were desirous of repeated visits from scientists representing one special academic area as for example: biology or geology. Every effort is made to arrange for selected schools to have as many as four follow-up visits if these visits are compatible with the curricular program of the school. A number of schools including those with small and large enrollments have utilized the opportunity of inviting several scientists. The increasingly high costs of travel and other operations necessitate rigorous monitoring of program expenses. It is with great gratification that the scientists of the state have shown their willingness to accept the very modest honoraria and mileage stipends in order to serve Tennessee's high school students and teachers. It must be noted that this outstanding public service often is made at a financial and personal sacrifice to the individual scientist.

Evaluative comments from both the schools and the scientists seem to indicate that the program has considerable popularity and is deserving of continuation in future years. Evaluation reports from the school and the scientist are used after each visit. Feedback from the scientists, science teachers, principals, and students is 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:

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

Topics in the biological sciences continue to be the most frequently selected; however, the earth sciences have gained rapidly in popularity in the past few years. Following is a progress report of 1976-77 activities as of November 10, 1976:

Number of schools requesting visits	45
Number of visits completed	14
Number of class periods involved	37
Number of students involved	1385
Number of teachers and other staff	76
Number of visits not completed	2

Fourteenth Annual Tennessee Visiting Scientist Program
1975-76 Summary of Activities
By A. Paul Wishart—Director
Professor (Science and Environmental Education Area)
Approximately 100 scientists from more than twenty colleges,

universities, state, and federal agencies were participants in the official 1975-76 Roster. A statistical summary of activities for the Tennessee VSP in 1975-76 follows:

Visits requested	67
Visits cancelled	10
School classes visited	151
Students contacted	8515
Teachers and Staff contacted	181
Miles driven by scientists during the 1975-76 program	3533"

The Director's report was accepted by a passed motion. The Acting Director of the Junior Academy, William N. Pafford, submitted the following report:

"A total of 534 Newsletters for 1976-77 have been mailed to high schools across the state. Both public and private schools are included. The newsletters are designed to explain the program of the Junior Academy to school administrators and science teachers.

Students who participate in the program will submit papers to the Director. A panel of readers will then rate the papers and fifteen to twenty-five will be selected for presentation at the JTAS spring meeting. The spring meeting will be held this year on April 15 at George Peabody College in Nashville. Special thanks are extended to Peabody and to Dr. Gus Tomlinson for his assistance in completing arrangements for the meeting.

Specialty Printing Company of Johnson City has been employed to print Newsletters, Coversheets, Instruction Sheets, Certificates of Participation, Membership Cards, and letterhead stationery. All are necessary in order for this year's program to be carried out.

Dr. John Bailey has provided invaluable assistance and advice to me as I have attempted to develop the 1976-77 program. Mrs. Jean Knox, who has provided secretarial assistance through the years, has agreed to continue in this capacity. This year's program would not have been possible without her help."

The Acting Director's report was accepted by a passed motion. After John Bailey resigned as Director of the Junior Academy, President Mallette had appointed William N. Pafford acting director. At this point, the Executive Committee passed a motion to appoint Dr. Pafford full Director of the Junior Academy.

The Director of the Collegiate Division, Richard Raridon, submitted the following report:

"Three regional meetings of the Collegiate Division were held during the spring of 1976 as follows:
Western Region, March 20, at LeMoyné-Owen College. Sixty-five students were present from six colleges. Eleven papers were given by students from four colleges, each of whom received a certificate of participation. Lunch for the registrants was provided compliments of Plough, Inc., and the Memphis Area Cluster Organization.

Middle Region, April 17, at David Lipscomb College. Twenty-one papers were presented by students from six schools. The luncheon speaker was Dr. Herman Thomason of the Marshall Space Flight Center.

Eastern Region, April 10 at Lincoln Memorial University. Forty-three were in attendance and seven papers were presented by students from four schools, each of whom received a certificate of participation.

The sponsor of the Western Region, Dr. George E. Rouse, died October 4, 1976. Dr. Rouse, retired from the chemistry department at Bethel College, had served for a half dozen years and will be sorely missed. The other regional sponsors, Dr. Robert G. Ziegler of Lincoln Memorial University and Dr. John T. Netterville of David Lipscomb College, continue to serve diligently.

The total expenses for the spring meetings were \$477.22." The Director's report was accepted by a passed motion.

The Academy's delegate to the Association of Academies of Science, Richard Raridon, submitted the following report:

"I attended the annual meeting of AAS which was held on February 23-24, 1976, in Boston, MA. The proceedings of this meeting have been published in the 1976 issue of the AAS Directory and Proceedings, which I edited. Two sessions were held, one on the language requirements for the Ph.D. degree, and another featuring histories of several state academies of science. I would like to urge that we actively pursue the publication of a history of TAS.

After having served four years as secretary-treasurer of AAS, I was elected to the office of president-elect and also appointed to serve as AAS delegate to the AAAS Council. Thus, I will be attending the next AAS meeting, to be held in Denver on February 22, 1977. A portion of my expenses to that meeting will be paid for by AAAS."

Dr. Raridon's report was accepted by a passed motion. The Executive Committee also congratulated him on being elected to the office of President-Elect of AAS and also appointed to serve as AAS delegate to the AAAS Council.

The Director of the Reelfoot Lake Program, Wintfred Smith, submitted the following report:

"In my memorandum dated April 23, 1976, it was pointed out that no part of the appropriation awarded to the Academy from the State Department of Education is specifically earmarked for the operation of the Reelfoot Lake Biological Station. The Executive Committee, as trustees of the station, remain legally responsible for the station until such time as our lease is terminated. Section 4 of Senate Bill No. 453, passed by the state legislature on June 29, 1931, states specifically that when the building and grounds of what is now the Reelfoot Lake Biological Station cease to be used, they shall revert to the Department of Fish and Game, now the Tennessee Wildlife Resources Agency. In truth, the station has not been used since 1969. Since the building itself is unsafe, and nothing short of total reconstruction will make it useable, I, with the concurrence of the Advisory Committee, recommend that the Academy terminate its lease of the building and grounds at Reelfoot Lake. A letter should be forwarded from the President of the Academy to Mr. Wilbur Vaughan, Manager Region I, Tennessee Wildlife Resources Agency, 1186 Highway 45 By-Pass, Jackson, Tennessee 38301, stating our wish to do so.

Serious consideration should be given to the question of whether or not the Academy wishes to retain such a program as one of its functions, since we will not have an active station for some time to come. Due to the current economic situation, immediate prospects for the development of even a modest biological station do not seem very bright. We believe, however, that the project should be pursued and that the facility be one that would support both research and teaching. Due to many uncertainties, a time frame for the completion of this project cannot be constructed at this time.

The Reelfoot Lake Biological Station has a long and distinguished history. The Tennessee Academy of Science can be justifiably proud of its operation. Unfortunately, time and vandalism have taken their toll of the station and development of a new station will be difficult and time consuming. Since the Academy has a long history of supporting field work in Tennessee, I wish to recommend that it continue to provide such support to Tech Aqua."

The Director's report was accepted by a passed motion. Another motion was passed to terminate the lease of the building and grounds at Reelfoot Lake. President Mallette will write a letter to Mr. Wilbur Vaughan.

In considering the feasibility of supporting the Tech Aqua Biological Station only, a motion by Dr. Wishart was passed to have Dr. Smith act as a Study Committee of one to investigate the activities of water-related research activities across the state. Depending on the results of such a study, the Academy would like to consider supporting several biological stations.

The Chairman of the Science Advisory Committee, William Ellis, submitted the following report:

"As most of you know, the Science Advisory Committee did considerable groundwork during 1975 regarding the establishment of a roster of scientists from across the State who would be willing to serve in an advisory capacity to members of the Legislature. In addition to two planning meetings by the Science Advisory Committee, I surveyed members of the Tennessee General Assembly and found a considerable interest on their part in the formation of such a roster. I reported this information to the Executive Committee at the annual Tennessee Academy of Science meeting last year. After some discussion at that meeting, I was authorized a budget of \$500 to proceed in establishing the roster and coordinating the services of these scientists with the needs of the members of the Legislature.