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"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9120706

FROM: VEIGEL, Jon M.: OAK RIDGE ASSOCIATED UNIVERSITIES

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 03/04/91

SUBJECT: ORAU'S NEW ANNUAL REPORT.

ASSIGNED TO:

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: D. Allan Bromley

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 03/11/91

FILE: EDUCATION



Oak Ridge
Associated
Universities

Post Office Box 117
Oak Ridge, Tennessee 37831-0117

9120706
RECEIVED

President's
Office

91 MAR 11 P 3:15

March 4, 1991

OFFICE OF THE
DIRECTOR

Dr. D. Allan Bromley
Assistant to the President
Office of Science & Technology Policy
Old Executive Office Building
17th Street and Pennsylvania Ave., NW
Washington, DC 20506

Dear Dr. Bromley:

I am delighted to send you our new Annual Report. It features the people of Oak Ridge Associated Universities--the people on whom ORAU's success depends, both as a multi-university consortium and as a laboratory for the Department of Energy.

You can be proud of the organization this report describes and in whose history you played a vital role. Thank you for your good service to ORAU.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Jon M. Veigel', with a long horizontal line extending to the right.

Jon M. Veigel
President

JMV:eak

Enclosure: Annual Report

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Please draft a pleasant short reply
DOB

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THE WHITE HOUSE

WASHINGTON

March 13, 1991

Dear Dr. Veigel:

Thank you for your letter of March 4 enclosing a copy of your Annual Report. I am always pleased to hear success stories--they are a welcome change.

Keep up the good work! I appreciate your thinking of me.

Best wishes.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "D. Allan Bromley". The signature is fluid and cursive, with the first name "D." being small and the last name "Bromley" being larger and more prominent.

D. Allan Bromley
Assistant to the President
for
Science and Technology

Dr. Jon M. Veigel
President
Oak Ridge Associated Universities
Post Office Box 117
Oak Ridge, Tennessee 37831-0117



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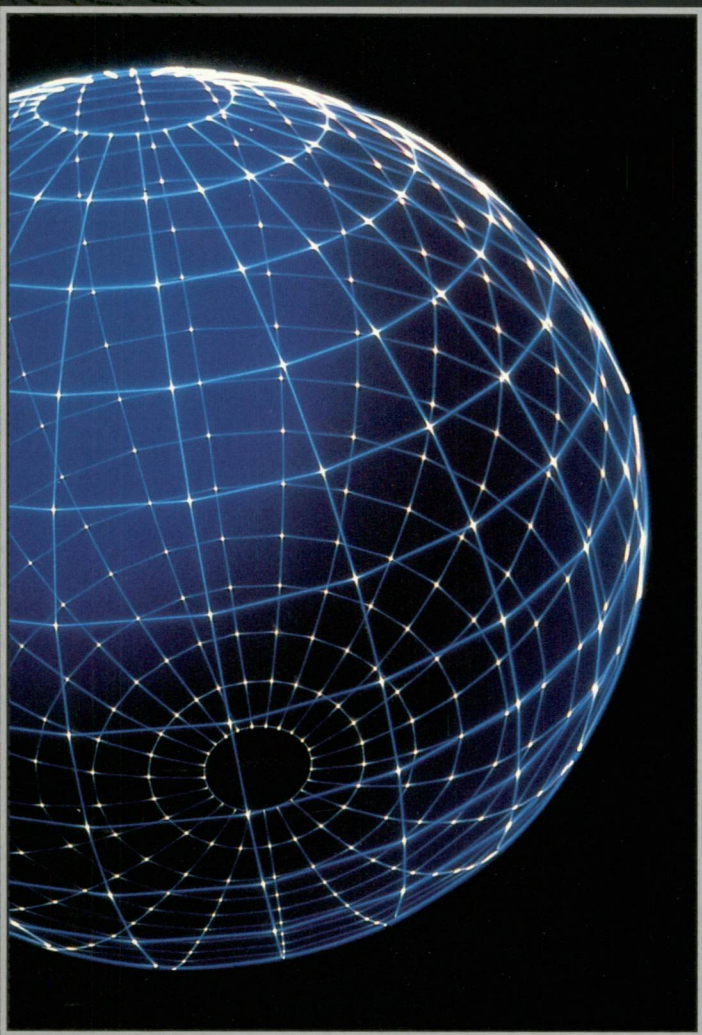
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Jon M. Veigel
President

JMV:eak

Enclosure: Annual Report

OAK • RIDGE • ASSOCIATED • UNIVERS



OR 19
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Oak Ridge Associated Universities is a not-for-profit consortium of 59 colleges and universities and a management and operating contractor to the U.S. Department of Energy, conducting research and development to ensure that energy systems are effectively used to meet national challenges.

For more information, please contact the Office of Communication Resources, Oak Ridge Associated Universities, P.O. Box 117, Oak Ridge, Tennessee 37831-0117, or call (615) 576-3146; FTS 626-3146; FAX (615) 576-4643 or FTS 626-4643.

TABLE OF CONTENTS

Statement From The Chairman of the Board of Directors	2
Statement From The President and Chief Executive Officer	4
The People Of ORAU	
REAC/TS Radiation Expert Called To Chernobyl	6
CER Provides Data For Innovative Mortality Study	8
ORAU Supports Advances In High-Energy Physics	10
Workers Retrain As Health Physics Technicians	12
ORAU Staffers Provide Expert Assistance to DOE "Tiger Teams"	14
RIDIC Researcher Develops Software For Radiation Analysis	15
Women In Science Conference	17
EESD Sabbatical Offers Opportunities To Improve Radiation Education	17
SERS Student Studies In Oak Ridge And Geneva, Switzerland	18
Index To Financial Statements	22
Report Of Independent Accountants	23
Financial Statements of Oak Ridge Associated Universities, Inc.	24
Officers of the Corporation	35
Principal Staff	35
Council of Sponsoring Institutions	36

Statement From The Chairman Of The Board Of Directors

Oak Ridge Associated Universities is an organization sponsored by 59 member universities and actively engaged in research, educational, and technical programs related to national needs and interests in the areas of energy, health, and the environment. It is interesting and important to compare ORAU's status from year to year and to reflect on our progress, or lack thereof. We continually expand, our operating funds increase, and we continue to seek new ways to involve more fully our member institutions in ORAU's programs and activities. We can note particular developments which augur well for the future.

It is timely that I mention one long-standing objective that has not received adequate attention, namely, increased diversification of the sources of our funds — to avoid being too tightly tied to policies and budgetary problems of the federal government. The fact is that private sector and corporate funds now constitute a much smaller percentage of our operating funds than a decade ago. In the last ten years our total has increased from 16 million dollars to 43 million per year (last year) while the

combined private sector and corporate share has decreased from 15% to 5%. We obviously have not been successful in diversifying in spite of periodic attempts to initiate specific measures to do so. I hope our Strategic Planning Committee will give serious attention to this matter. Hopefully, the Vice President for University and Industry Programs currently being recruited will also help us in this area. The matter of diversification of funds may be relevant to last year's lively discussions as to whether ORAU is or should be a national laboratory. That topic is now a dead issue. Nonetheless, we are indeed a unique type of DOE laboratory, and much of our soul searching may stem from that fact.

We are now embarked on a sounder planning process than ever before. The joint Board-Council activity under William Manly's chairmanship should lead to realistic and rational efforts to increase ORAU's contributions and effectiveness in several important ways.

The relationship of the faculty of ORAU's sponsoring institutions to ORAU's programs has always concerned us, and the recent Councilor Communications Review suggests opportunities for significant improvement.

Better communication between ORAU staff and university faculty should increase the possibilities for the development of multi-university efforts and consortia and demonstrate ORAU's strong interest in facilitating such developments. The new Council committee system will hopefully increase meaningful interactions between faculty and ORAU.

During the past year there have been several gratifying developments worthy of note, as well as some disappointments. 1) The availability of funds from the ORAU Foundation gives substance to our hopes and plans for the Foundation's future contributions to ORAU's activities. 2) The planning for a new medical sciences building on campus is at an advanced state, but we are still awaiting DOE approval. 3) The building of a dedicated conference center is apparently an increasingly likely development. 4) Until very recently, MARCOR seemed to be doing well, but there have been some defections of commercial users of the marmosets. 5) We have not made progress in developing a collaboration with SURF in developing new materials sciences facilities at ORNL. 6) Because part of our epidemiological work on Department of Energy activities, the part classified as analytical rather than descriptive, will be moved to the jurisdiction of the Department of Health and

Human Services, the continuation of some of ORAU's ongoing projects is uncertain.

It is evident that Jon Veigel and his principal associates are providing dynamic and vigorous leadership that includes the development of interesting new initiatives. That type of leadership augurs well for ORAU. However, progress and well being are dependent on external factors as well as on internal strengths and efforts. The federal budgetary situation, the threat to the epidemiology center, and DOE's present inclination to close the Holifield Heavy Ion Research Facility at ORNL, and therefore UNISOR as well, for reasons of economy are three worrisome matters. Nonetheless, ORAU's focus on energy, the environment, health, and education should provide the basis for continued and even increased support from governmental agencies, particularly in view of America's needs in these areas. We are all aware of the crisis in education, especially in the development of adequate number of future scientists. Certainly an organization such as ORAU ought to be able to make a major contribution in this area.

Oscar Touster

Oscar Touster,
Chairman of the Board



Statement From The President And Chief Executive Officer

Since I came to Oak Ridge Associated Universities in 1988, I have visited the campuses of 31 of our now 59 member universities and have been to a number of DOE and other federal facilities. In those visits, I have come to realize that ORAU can be described as the nation's best known, unknown scientific organization.

initiatives we have underway, all directed at changing the ratio of best known to unknown to be a larger number!

Our simultaneous attention both to our members and to our customers emphasizes ORAU's separate, yet overlapping, dual roles. This difference can be

ORAU's federal missions are unique. No other DOE laboratory has as its primary mission just those issues that have confounded our nation's ability to resolve our energy problems for the last 20 years. We at ORAU also recognize that we are woven into the larger enterprise of science. All of us do science anchored in both the reality of the impacts we produce in society and the perceptions of those impacts that are held by society.

We live in an age in which our options have dramatically increased because of science and technology while at the same time our problems have gotten bigger and more numerous—often also because of science and technology. The net result is that our expectations of science have changed. Compared to the way science was done yesterday, tomorrow will present us with both new requirements and new opportunities.

For ORAU, the question of how we position ourselves in the future revolves as much around how we do our science as it does around the details of what science we do. What we do and how we do it resonates between our activities as a laboratory in the family of DOE laboratories and our separate activities as a multi-university consortium.

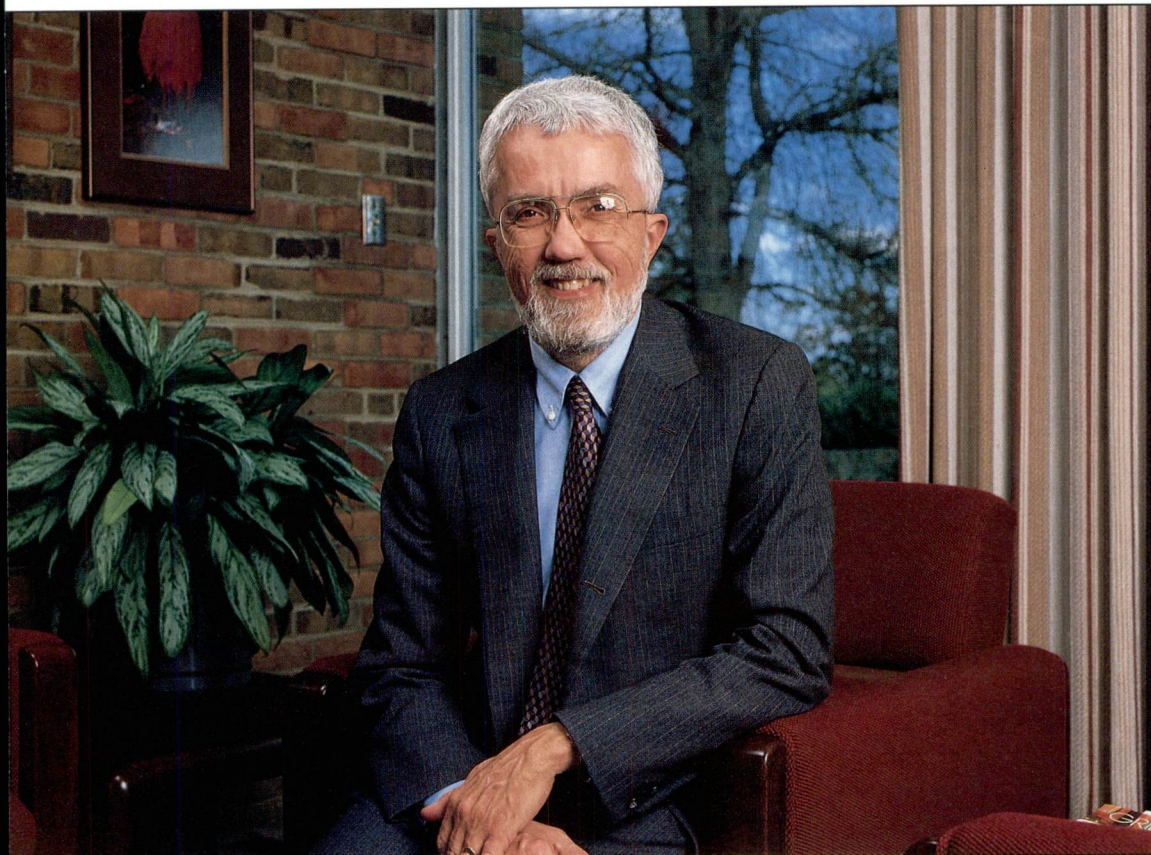
ORAU does not fit the common conception of a DOE laboratory. We do not operate reactors or other large physics machines, nor do we do weapons research, nor do we develop technologies for industry. Through our four operating divisions, we instead

We are best known by the federal customers we serve as a DOE laboratory and by those faculty and administrators among our members with whom we work. We are unknown to the rest of DOE and to the bulk of faculty, administration, and students among our membership. This report reviews some of the

illustrated by the verb used to describe us:

Oak Ridge Associated Universities is a laboratory for the Department of Energy and

Oak Ridge Associated Universities are institutions acting together for mutual benefit in science and technology.



strike a balance among basic research, applied research and analysis, technical assistance and assessment, education and training, and program management.

As a medium-size, multi-program DOE laboratory, ORAU has particular interests in helping resolve major questions that confront our society. Our staff of more than 600, with a budget that now exceeds \$50 million, seek answers to questions in medical science, education, training, and energy and the environment.

- What are the positive and negative health impacts to individuals and societies from man-made and natural substances that are a part of our energy and energy-related systems? How can we compare the health impacts from different energy systems?

- How can we assist our educational systems to produce the quality and quantity of scientists, engineers, and technologists needed by society? How can we build toward a public that is aware of the importance of science and technology to our energy future?

- How do we reliably and effectively ensure the nation has a scientific, engineering, and technical work force trained to meet the increasingly demanding job performance requirements of a competitive world economy?

- How can we provide an integrated understanding of the interactions of our energy systems and our environment?

ORAU also brings to DOE the advantages of its long-established multi-university consortium. Facilitating contact between academia and the federal laboratory system was the original motivation to establish ORAU 44 years ago. That purpose has been strengthened this past year with the addition of four new sponsoring institutions to the ORAU fold—the University of South Alabama, Howard University, Georgia State University and the University of New Orleans.

ORAU now has 59 universities as members. In addition, Maryville College has recently become the first institution selected as an associate member—a class of membership focusing on primarily undergraduate colleges. As measures of the individual and collective strengths of our members, nearly half are in the nation's top 100 research universities, and one in five of all science and engineering Ph.D.s awarded in this country come from ORAU institutions.

Working with and for our membership, ORAU provides information on federal opportunities for research and fellowships and operates separate consortia in nuclear structure and in marmosets. A major, and growing, area of ORAU service to its members is in facilitating formation and operation of multi-university collaborative research partnerships.

A recent example is SAHEP, the Southern Association for High-Energy

ORAU DOES NOT FIT THE COMMON CONCEPTION OF A DOE LABORATORY.

THROUGH OUR FOUR OPERATING DIVISIONS, WE INSTEAD STRIKE A BALANCE AMONG BASIC RESEARCH, APPLIED RESEARCH AND ANALYSIS, TECHNICAL ASSISTANCE AND ASSESSMENT, EDUCATION AND TRAINING, AND PROGRAM MANAGEMENT.

Physics. ORAU catalyzed the formation of this 17-university collaborative proposal for funding by the state of Texas of detector research for the Superconducting Super Collider. Six committees of members have been established to explore new multi-disciplinary, multi-institutional partnerships in emerging areas of national research interests.

This report illustrates our dual roles as a DOE laboratory and a multi-university consortium. In both roles success depends on people—the people of ORAU, the people as faculty, students and administrators at America's colleges and universities, and the people in the federal government on whose behalf we can carry out our contractor responsibilities.



ORAU is these people.

Jon M. Veigel,
President and Chief Executive Officer

REAC/TS Radiation Expert Called To Chernobyl

Can humans ever again live safely in the areas of the Soviet Union affected by radioactive contamination following the April 1986 accident at the Chernobyl Nuclear Power Plant?

Such a possibility seems remote after looking at photographs of Pripyat, the Russian city surrounding Chernobyl, taken by ORAU's Dr. Robert C. Ricks on a recent trip there.

Grass grows from sidewalks where no former residents have trod in more than four years. Traffic lights that once signaled a bustling population to "walk" or "don't walk" stand dark. Windows on an abandoned building are dotted with dogwood decals, and a bright yellow sign promotes a May Day festival that never happened.

Over it all looms the concrete, sand and steel sarcophagus built atop the crippled Unit 4 reactor to shield against any further radiation contamination.

A sobering sight, Ricks said, but one with which the Soviet government, the International Atomic Energy Agency and the worldwide medical community are trying to deal effectively. Ricks was in the Soviet Union last summer at the invitation of IAEA and the Russian government to speak at a series of three conferences to evaluate the effectiveness of the steps taken in the Chernobyl area to safeguard the health of the Soviet population.

Ricks is director of the Radiation Emergency Assistance Center and Training Site—REAC/TS—that ORAU operates for the U.S. Department of Energy, providing support and training for the medical management of radiation accidents worldwide.

Though not actually called to assist with the Chernobyl accident in 1986, REAC/TS staff were on standby to go to the Soviet Union. REAC/TS provided direct assistance to the U.S. State Department following the accident by evaluating U.S. embassy personnel in Moscow, Warsaw, and Bucharest for contamination and informing them of the potential health impacts of the accident.

"There's no plan now or in the future to repopulate Pripyat," Ricks said. "However, more people are living in the city of Chernobyl than before the accident occurred." But those people are engineers and technicians running the remaining reactor Units 1 and 2 and making sure that Unit 4 continues to be safe, though the cleanup following the accident is complete.

Ricks was one of four internationally recognized experts—the others were from Stockholm, Budapest, and the Radiation Effects Research Foundation in Hiroshima—asked to conduct the seminars. More than 1,200 Soviet physicians and health administrators attended the sessions held in Ovruch, Gomel and Novozybkov.

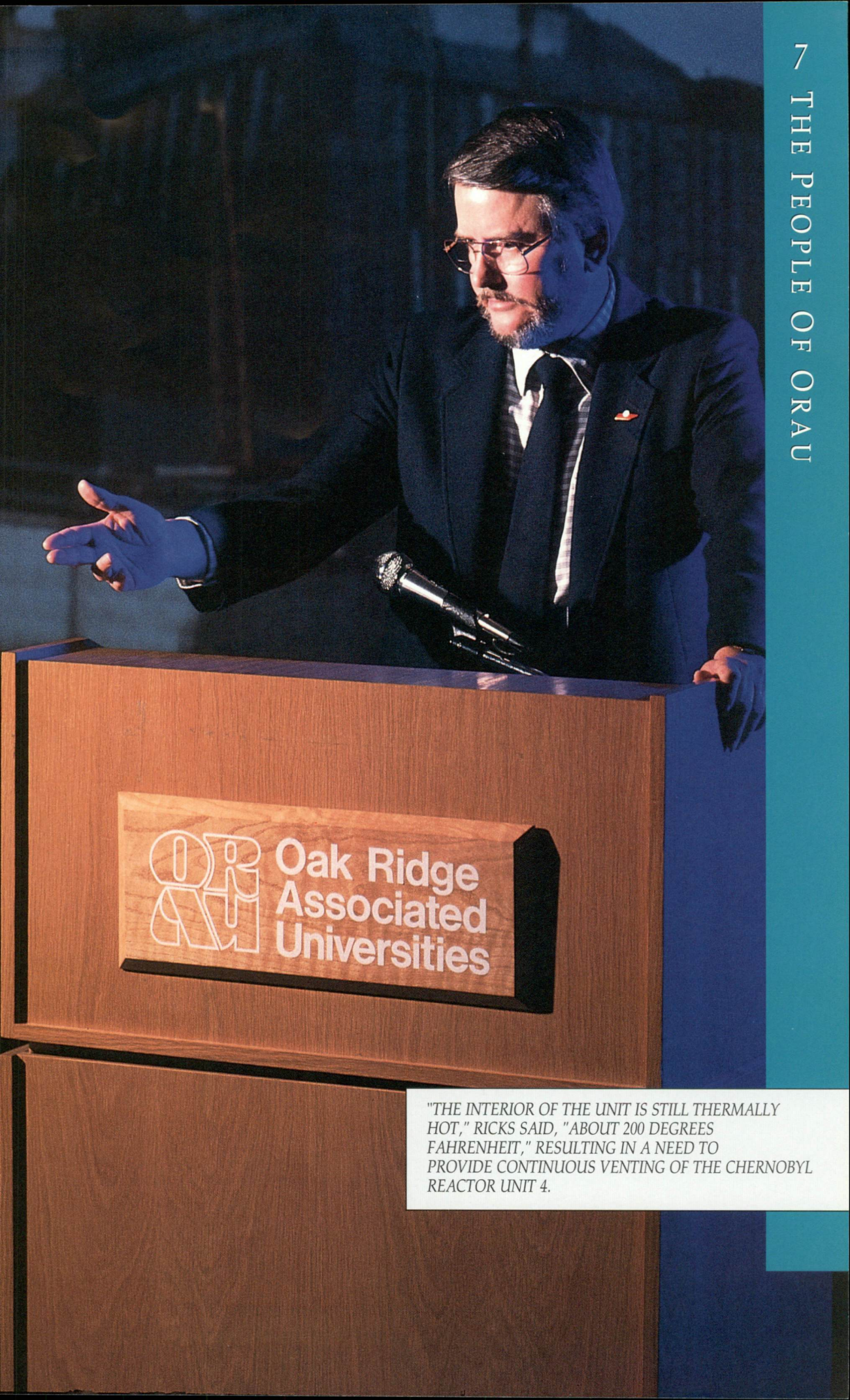
"The local medical community and the public at large showed considerable interest in the seminars," Ricks said. The seminars were broadcast over loudspeakers to listeners outside the crowded meeting hall at Ovruch, and all the seminars received substantial coverage by the national and local media.

The speakers had several informal encounters with groups and individuals representing the general Soviet population.

"What they really wanted to know was what health effects they could expect from the levels of exposure associated with fallout from the reactor accident," Ricks said. Based on presently available information, he added, those levels are so low as to pose no measurable health risks for the great majority of the population at risk.

"The levels are similar to the exposure one gets from background radiation in Denver, Colorado," Ricks explained. Even in light of very recent studies on the transfer of cesium-137 from the environment to humans, internal contamination levels are "well below the maximum permissible," Ricks added.

An exception may be the thyroid dose from radionuclides released to the environment, he said. The Soviets informed the international team that several thousand persons (mostly children) could have received doses to the thyroid in excess of 200 rads. Environmental radioiodine levels were described to be as high as 1,500 Ci/km² in some areas downwind from Unit 4.



"THE INTERIOR OF THE UNIT IS STILL THERMALLY HOT," RICKS SAID, "ABOUT 200 DEGREES FAHRENHEIT," RESULTING IN A NEED TO PROVIDE CONTINUOUS VENTING OF THE CHERNOBYL REACTOR UNIT 4.

Visitors to the reactor site are permitted to get within about 50 meters of Unit 4 without taking special safety precautions. "To go in the restricted area nearer the reactor, we would have had to dress out and shower when we came out," Ricks said.

The concrete and steel sarcophagus covering Unit 4 has recently begun to leak, probably, Ricks said, because the weight of the structure has made it sink slightly, opening some of the seams. Another covering is under construction primarily to enhance the reactor's venting system.

"The interior of the unit is still thermally hot," Ricks said, "about 200 degrees Fahrenheit," resulting in a need to provide continuous venting.

Though the short-term danger from the Chernobyl accident has passed, studies on future health effects, and efforts to assist Soviet physicians in understanding the radiobiology of humans, will continue indefinitely.

"Better information could diminish considerably the concerns of the average Soviet citizen," Ricks said, adding that many Russian physicians were assuming symptoms their patients exhibited were associated with radiation exposure, when often they were not.

It is understandable, Ricks said, that the Russian population is concerned about the lingering effects of the Chernobyl accident. "The magnitude of the problem can only be appreciated by standing there and looking at Unit 4."

CER Provides Data For Innovative Mortality Study

Joe Weaver never saw himself as a groundbreaker.

An athlete? Maybe. He went to East Tennessee State University on a football scholarship and still works out in the gym regularly.

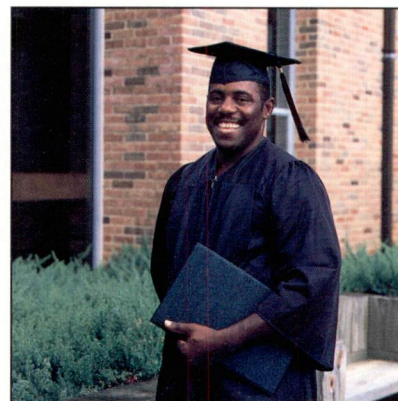
A people person? He had to be, in his first job at Oak Ridge National Laboratory in human resources, and his considerable volunteer work keeps him busy even today.

An environmentalist? His current job as manager for hazardous material storage tanks in the Environmental Compliance and Health Protection Division at ORNL has led him down that path.

But even though his career has taken him from a degree in criminology and psychology at ETSU to posts in human resources to janitor and laundry foreman at ORNL to technical editor to his present position, he has never thought of himself as a pioneer.

"I guess I'm at least one of the first graduates in epidemiology" from the University of Tennessee's School of Health, Leisure, and Safety, he said. In earning his doctorate in December, he also forged a unique partnership among the university, ORNL, and the Center for Epidemiologic Research that ORAU operates under contract to the U.S. Department of Energy.

Weaver's dissertation, with strong direction from ORAU epidemiologist Dr. Donna Cragle, was a retrospective mortality study of people who retired from DOE-operated facilities in Oak Ridge during the years 1960 through 1979. The study identified numbers of deaths in the retirees from the 10 leading causes of death according to national statistics; Weaver then compared those numbers to those expected in the general U.S. population for both hourly and salaried workers.



Joe Weaver

"We were interested in identifying socioeconomic effects on the death rates at the plants," Weaver said, "and we hope that this type of study will help us identify occupational hazards, if any, within the work place." The study could also help identify potential lifestyle factors that could be harmful to health.

His dissertation, Weaver said, represents the first time that DOE contractor retirees have been studied as a distinct group rather than being included in studies with currently employed workers.

It is also one of few studies of DOE workers to date that has included women. Women are much more difficult than men to trace for such studies since their names and participation in the work force change much more frequently.

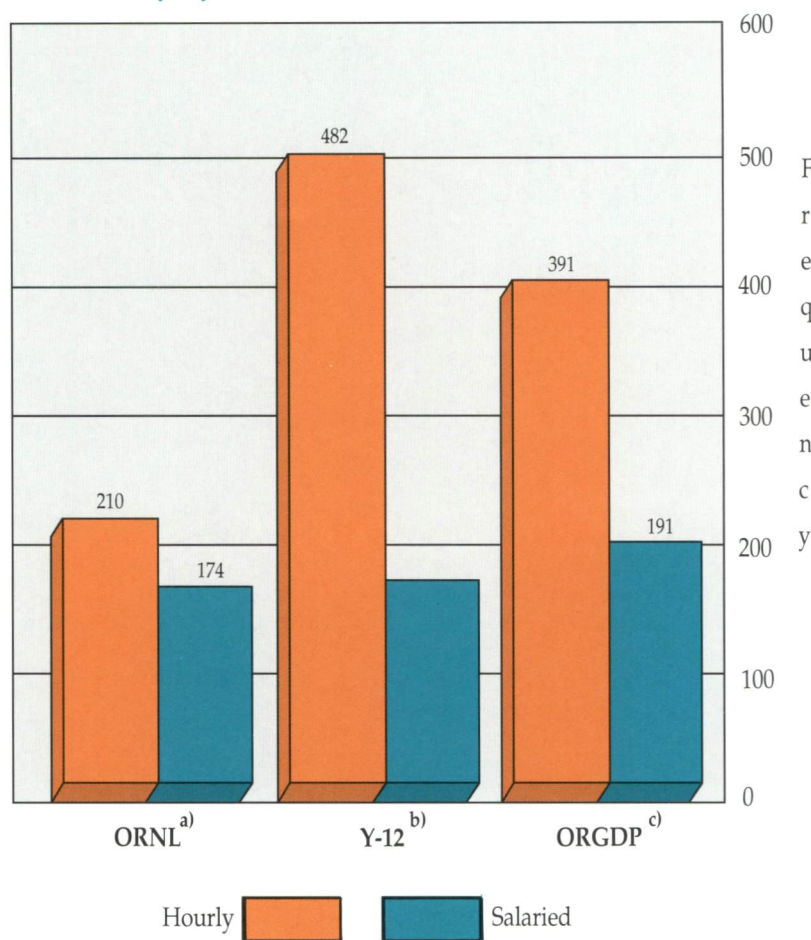
Weaver knew the data he needed for his study already existed at the Center for Epidemiologic Research. It was a matter of writing a proposal and study protocol to present to CER's research planning group headed by Dr. Shirley Fry, director of CER, and Dr. Carl Shy of the University of North Carolina and to Weaver's UT committee chairman Dr. Bill Wallace.

The proposal had to show that the study was feasible, had scientific merit and was compatible with the objectives of the overall Health and Mortality Study of DOE workers that CER is conducting for DOE.

An accepted scientific protocol is a requirement for any researcher who wants to use the data collected by CER since its inception in 1977 on the mortality experience of more than 200,000 persons who have worked for DOE, its predecessor agencies or its contractors at one or more facilities.

Weaver was supported in his request by Martin Marietta Energy Systems, which now operates the Oak Ridge plants for DOE. The company was so interested in the study, Weaver said, that it bore much of the costs of his dissertation and allowed him to fit his work schedule around his research time.

Frequency of Deaths: All Sites
by Pay Status for White Males: 1960-1984

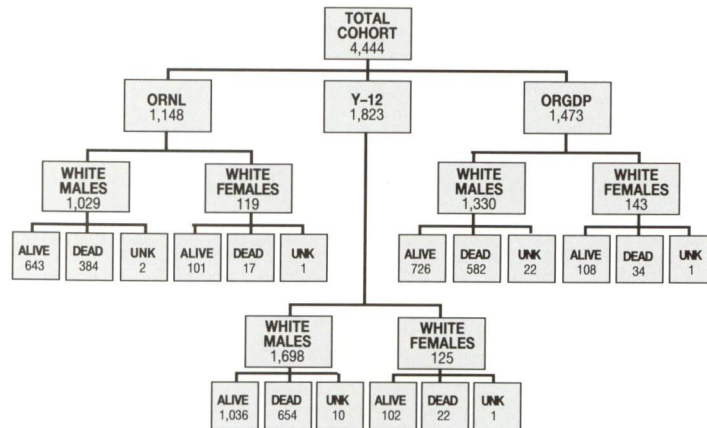


A mortality study conducted by Joe Weaver of Oak Ridge National Laboratory, in collaboration with Oak Ridge Associated Universities, examined death rates among 4,444 retirees — 4,057 white males and 387 white females — from ORNL, the Oak Ridge Y-12 Plant, and the Oak Ridge Gaseous Diffusion Plant (K-25). The study included mortality experience of salaried and hourly retirees who were employed at the plants for at least 10 years and who lived a minimum of 30 days beyond their retirement dates.

A general finding of the study was that socioeconomic factors, as determined by hourly or salaried pay codes, were an important consideration in mortality rates. Statistically significant increases in deaths from all causes were observed among male hourly workers when directly compared to salaried workers. Further follow-up of the population is needed, Weaver said, to examine independent and combined effects of potential work-related radiation and chemical exposures and lifestyle behaviors on death rates.

- a) Total population: 449 hourly
580 salaried
- b) Total population: 1214 hourly
484 salaried
- c) Total population: 813 hourly
517 salaried

Cohort Vital Status and Distribution by Facility and Sex



Once the proposal was accepted, Weaver was able to use the data at CER as a collaborator with the CER researchers on the Health and Mortality Study. Cragle served on the dissertation committee, essentially directing the research. Phil Wallace of CER offered computer assistance, and Fry and Dr. Elizabeth DuPree reviewed the final product.

"Dr. Cragle has been instrumental in ensuring that the analyses are, in fact, accurate from an analytical and statistical point of view," Weaver said. His whole dissertation experience, Weaver said, "demonstrates ORAU's willingness to make its resources and experience available to other scholars and to help make sure that the results are scientifically valid."

This doctoral program was not Weaver's first effort at continuing education. After earning his bachelor's degree at ETSU and going to work at ORNL, he went back to school

at Roane State Community College for an associate's degree in business administration. He later earned a master's degree at UT in occupational health and safety.

"There's just something about education that automatically avails itself to mobility" in a career, Weaver said. He hasn't yet decided if he'll use his new degree to continue to add to his responsibilities in research at ORNL or to enter the classroom as a teacher. He sees his research as opening a pathway for other UT students to collaborate with ORAU epidemiologists.

"What we have tried to do with our kinship between UT and ORAU is to establish a bridge for other students to come in and do follow-up studies of this cohort of retirees to get more conclusive data," Weaver said. Some of those studies may include information on smoking and drinking habits as well as on occupational radiation exposure.

In the meantime, Weaver will be working with the CER epidemiologists to meet his commitment to write a paper based on his dissertation for submission to a peer-reviewed journal for consideration for publication.

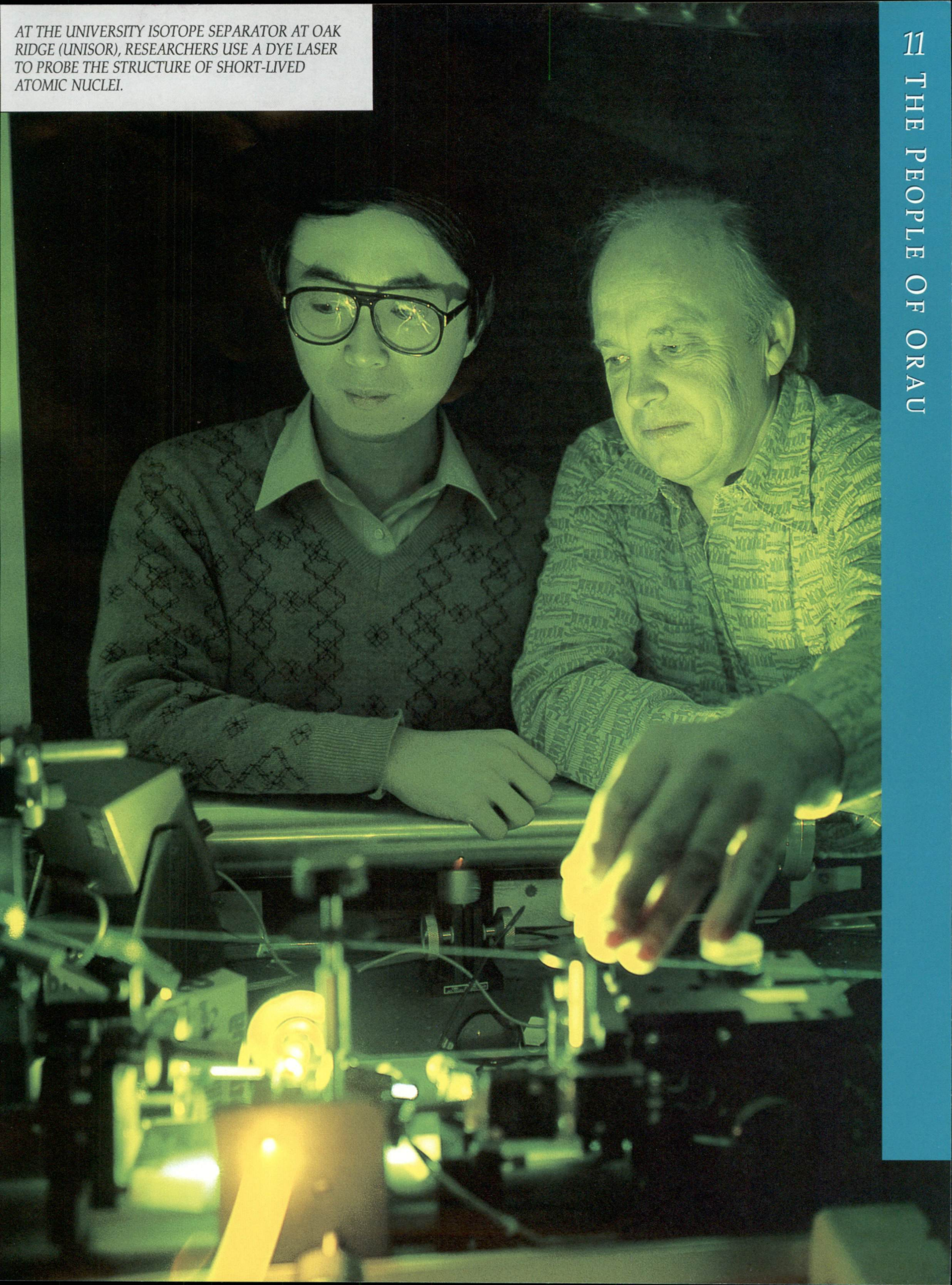
ORAU Supports Advances In High-Energy Physics

Advances in the field of high-energy physics have prompted researchers to reconsider traditional models of the structure of matter and the rules that govern its behavior. These advances have resulted, in part, from research conducted using increasingly powerful particle accelerators. The most powerful accelerator yet proposed—20 times more powerful than any facility on line today—is the Superconducting Super Collider (SSC) being developed by the U.S. Department of Energy near Dallas-Ft. Worth, Texas.

When completed, the SSC will be a 53-mile-long, underground oval, a racetrack for twin beams of protons accelerated in opposite directions to nearly the speed of light. When these beams collide, physical reality as we are used to understanding it will be shattered, allowing researchers an ephemeral glimpse of the underlying structure of matter.

ORAU first became involved with the SSC-related research in 1986 when Dr. Frank Avignone, ORAU Councilor and chairman of the

AT THE UNIVERSITY ISOTOPE SEPARATOR AT OAK
RIDGE (UNISOR), RESEARCHERS USE A DYE LASER
TO PROBE THE STRUCTURE OF SHORT-LIVED
ATOMIC NUCLEI.



Physics and Astronomy Department at the University of South Carolina, and staff of ORAU's office of University and Industry Programs came up with the idea of a regional consortium to address detector issues in SSC-related high-energy physics research and development.

Avignone, who was instrumental in setting up the highly successful UNISOR—University Isotope Separator at Oak Ridge—nuclear structure facility through ORAU in the early 1970s, said he felt that "if the SSC was going to come, particularly to the South, we needed to establish a cooperative effort in order to compete with larger research institutions." Avignone also introduced the idea that ORAU could be a catalyst in bringing southern physicists together to form an alliance for collaboration.

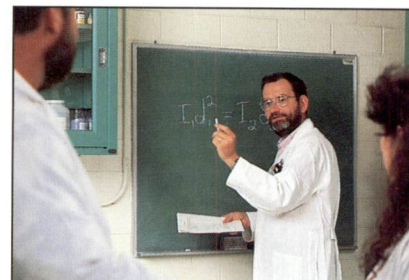
Later in 1986, the ORAU Council suggested that a committee be formed to determine what role ORAU should play in supporting SSC research. This committee decided that ORAU should sponsor a workshop designed to determine the level of interest in the South in establishing a collaborative research effort related to the SSC. The first ORAU Workshop on the Superconducting Super Collider was held in early 1988, and the Southern Association for High Energy Physics (SAHEP) was formed.

The SAHEP research consortium currently comprises 23 university-based groups and four research-oriented laboratories and industries. With support from ORAU and its member universities, SAHEP provides a strong regional base for groups involved in the physics, science, and technology associated with the development of the SSC.

"SAHEP members are developing connections with many collaborating institutions, DOE, and other SSC-associated research and development groups and are involved in high-energy physics projects of all sorts for the purpose of collaborating on SSC research and development," Avignone said.

SAHEP is involved in several SSC-related research proposals, including the \$23 million SAHEP Initiative for SSC Research and Education presented to the Texas National Laboratory Research Commission. This wide-ranging proposal would support initiatives in SSC-related research and development, facilities, and education at 20 SAHEP member institutions.

Workers Retrain As Health Physics Technicians



Recent sweeping changes on the international political scene and a reordering of domestic economic policies have brought about changes in the priorities of the U.S. Department of Energy. As a result, two major employment trends have emerged at many DOE nuclear weapons production facilities: cutbacks in some segments of the work force and an increased emphasis on monitoring radiation in the work place and cleaning up nuclear waste sites.

ORAU, through the Training and Management Systems Division, is applying training and technical expertise in assisting Martin Marietta Energy Systems in the development and delivery of the Radiation Protection Technician Training Program.

This program targets employees at three Oak Ridge plants managed for DOE by Martin Marietta who are either at risk to lose their jobs from reductions in force or who want to make career changes and trains them to be health physics technicians. Once they have acquired these specialized



skills, program graduates move into new jobs with Martin Marietta in the burgeoning field of radiation protection.

Participant Nathan Brady's enthusiasm is typical. "It's a good program, and radiation protection is an interesting field to get into, with good job security," Brady said. "I also get the satisfaction of working to clean up the environment."

Each training class of 20 to 30 attends 12 weeks of training, including two weeks in ORAU's health physics labs.

The training is being conducted in cooperation with instructors from Roane State Community College's health physics program; participants also receive college credit for their efforts.

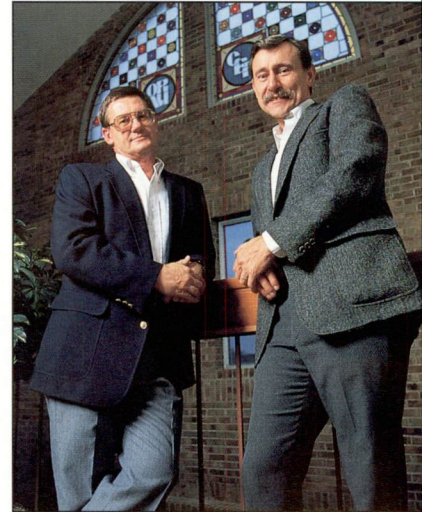
ORAU program director Dr. David Simpson described the emphasis of this program as "giving the participants a lot of hands-on experience—showing them what equipment responds to, what it doesn't respond to, and how it can malfunction. We also demonstrate the use of protective clothing and respiratory equipment, taking measurements with survey equipment, and analyzing samples with lab equipment."

Once participants complete the 12-week program, they go through another two to three months of on-the-job training at one of the three DOE plants in Oak Ridge. As health physics technicians, these newly retrained workers are prepared for a number of different types of work, including surveying materials for radioactive contamination, ensuring that radiation levels in work areas are safe, checking people for contamination when they leave work areas, and taking air and soil samples.

Other activities might include lab work, such as analyzing samples and calibrating instruments, or field work, such as collecting environmental samples and surveying waste burial sites.

The Radiation Protection Technician Training Program's emphasis on retraining current employees, particularly those affected by reductions in force, to respond to DOE's changing manpower needs represents a new approach to solving a familiar problem.

"This program breaks new ground in many respects," Simpson said. "It's a unique opportunity to retrain people who are in the middle of their career paths and bring them into areas where we need them more."



Jim Berger (left) and Jerry Eisele

ORAU Staffers Provide Expert Assistance to DOE "Tiger Teams"

ORAU experts took some time away from their normal duties in 1990 to participate in several of the Department of Energy's "Tiger Team" assessments, sharing their knowledge and expertise in on-site assessment activities at DOE facilities across the country.

Part of Secretary of Energy James Watkins' 10-point initiative to strengthen DOE's environment, safety and health protection and waste management activities, Tiger Team assessments are designed to ensure that DOE facilities achieve and maintain full compliance with federal and state environmental, safety and health requirements.

Among ORAU specialists who served on Tiger Teams were Dr. Jerry Eisele, director of the Center for Personnel Assurance, Research and Analysis in the Medical Sciences Division, and Dr. Jim Berger, program director for the Environmental Survey and Site Assessment program in the Energy/Environment Systems Division. Eisele and Berger both visited the Savannah River Laboratory in Aiken, S.C.

"My team evaluated the restart capability of the nuclear production reactors," Eisele said, "by looking at the personnel security aspects of the facility as well as the various physical security and safeguards components."

Berger said his team concentrated on environmental assessment, looking at such items as radiological effluents, procedures to monitor the environment, and regulations and compliance.

RIDIC Researcher Develops Software For Radiation Analysis

Latresia Wilson, a McKnight Fellow from the University of Florida, didn't wait for someone to hand her a doctoral research idea on a silver platter. Instead, she searched out ORAU's Radiopharmaceutical Internal Dose Information Center—RIDIC—and spent a year developing a software package to calculate the dosimetry of radiolabeled antibodies.

Wilson's choice of a site for her research proved judicious, considering the more than 33,000 bibliographic references on information needed for radiation dose calculation residing in the RIDIC data base. RIDIC's reputation in the medical community for developing computer software to calculate the radiation doses to the body from medically administered radionuclides was also a deciding factor in Wilson's choice of ORAU as a research site.



Latresia Wilson

RIDIC, a part of ORAU's Medical Sciences Division, has compiled and provided radiation dose information for the U.S. Department of Energy, other governmental agencies and contractors, nuclear medicine researchers, physicians, and others since 1971. RIDIC is the only group in the United States that routinely provides this information to those who need it.

During her year of research at RIDIC, Wilson kept to a busy schedule, dividing her time among ORAU, Oak Ridge National Laboratory, and the University of Tennessee Medical Research Center. "We really admired Latresia for her 'stick-to-itiveness,'" Evelyn Watson, RIDIC program manager, said. "She couldn't find everything she needed in the same place."

Wilson developed an analysis technique at RIDIC using SPECT—Single Photon Emission Computed Tomography—to calculate energy disposition from radiation emissions. She has submitted a copyright proposal for the resulting computer software through the University of Florida. She said she has also been gratified to find that her SPECT technique, developed over a period of a year, is similar to an approach produced at Johns Hopkins University by researchers who had worked on the project for years.

For her research efforts, Wilson was honored with the Black Graduate Society's award for most outstanding graduate researcher from the University of Florida in January 1990. She received her Ph.D. in medical health physics the following August and launched her career as an antibody physicist at the City of Hope National Medical Center in Duarte, Calif.

Wilson characterizes most of her work at the National Cancer Institute-sponsored site with derivatives of the word "excite."

It's "exciting to see my work in a clinical setting," Wilson said about the National Institutes of Health antibody project, through which she is developing monoclonal antibodies and techniques that allow a radioisotope to be attached to various antibodies.

The scope of Wilson's responsibilities actually includes multiple clinical settings comprising a wide range of disease stages and types of patients—animal and human.



AMONG THE ORAU SCIENTISTS AND EDUCATORS WHO PARTICIPATED IN THE TODAY'S WOMEN IN SCIENCE AND TECHNOLOGY CONFERENCE PRESENTATIONS AND PANEL DISCUSSIONS WERE (FROM LEFT) ERNESTINE FRIEDMAN, DR. DONNA CRAGLE, PEGGY KING, DR. MARY ELLEN BERGER AND DR. GAYLE LITTLEFIELD. NOT PICTURED IS DR. SUZETTE TARDIF.

On the human side, Wilson said, it is "exciting to observe a probe tracing radiolabeled emissions from a patient in an operating room." Part of her work will involve modifying and enhancing the probe.

Choosing to begin her research career at the City of Hope was not an easy decision for Wilson. "I decided between this position and teaching," she said, "and now, when I do decide to teach, I can say, 'I did this' or 'I encountered that.'"

In the meantime Wilson is reveling in having at her disposal such facilities and expertise as those found at the City of Hope. And, as she was able to do at ORAU, she said, "I can choose my own research opportunities" and "not be just a hired hand."

Women In Science Conference

The nation's burgeoning need for professionals and teachers in science, mathematics, computer science, and engineering presents many new career options for women entering the job market. In the future, women will constitute an increasingly large percentage of the U.S. work force.

"Today's Women in Science and Technology," a conference co-sponsored this past spring by ORAU and Oak Ridge National Laboratory, provided an opportunity for college women to meet with professionals in scientific and technical fields and learn more

about the career options available to them. Keynote speaker was Dr. Shannon Lucid, a NASA astronaut who participated in two space shuttle missions.

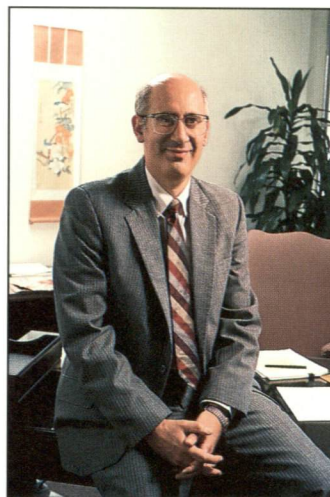
Among the ORAU scientists and educators who participated in the conference presentations and panel discussions were Ernestine Friedman, Dr. Donna Cragle, Peggy King, Dr. Gayle Littlefield, Dr. Mary Ellen Berger, and Dr. Suzette Tardif.

EESD Sabbatical Offers Opportunities To Improve Radiation Education

The old black-and-white film crackles to an end as a group of wide-eyed junior high students sit in a darkened classroom, mulling over the images they have just seen of a devastated Hiroshima after the release of the atom bomb. As the lights come on, hands fly up in the air with questions.

The questions, even from eighth graders, are tough, and deciding how to answer them is even tougher.

Determining what role the federal government should have in educating the public about radiation is just one of several projects tackled by Dr. Kenneth Mossman, assistant vice president for research at Arizona State University, who recently completed a sabbatical in ORAU's office in Washington, D.C.



Dr. Kenneth Mossman

As a Faculty Research Fellow on sabbatical to ORAU's Energy/Environment Systems Division and the Committee on Interagency Radiation, Research and Policy Coordination (CIRRPC), Mossman provided technical support for CIRRPC's Public Education Subpanel.

CIRRPC coordinates the nation's radiation policy and research among 18 federal agencies and departments and reports to the Office of Science and Technology Policy, Executive Office of the President. EESD provides CIRRPC with administrative assistance by calling on a talent pool of more than 400 consultants—such as Mossman—to address radiation issues.

From Hiroshima to Three Mile Island to Chernobyl, radiation and its effects on humans and the environment have never been far from the public's eye. "There is a great deal of fear about the effects of radiation, and public education is one of

10 national issues targeted by CIRRPC," Mossman said. "The goal is to determine just how the government ought to be involved in radiation education."

Working closely with Dr. William A. Mills, senior technical advisor, and other EESD staff members in the Washington Office, Mossman assisted in coordinating meetings on public education, including what government programs should be established to help educate the public about radiation.

"Providing important information about nuclear technologies to the public without appearing biased toward nuclear can be a delicate issue," Mossman said, "and it is important for the government to remain unbiased." Though it is an ongoing project, he said the subpanel should be ready to issue a written report on the subject in 1991.

"The sabbatical provided me with the opportunity to learn a lot and work in an area that I'm very interested in, which is public education," Mossman said. "I gained a governmental perspective on the issues, and as an academician I was also able to provide ORAU with an outside perspective based on my experience." Mossman's research interests include health physics and the biological effects of radiation.

"The real fun of it all," he added, "was the opportunity to interact with others and have informal dialogue with a variety of people on different subjects."

Mossman is now coordinating a workshop tentatively scheduled to be held in the Washington area in 1991. Experts from government and the private sector will discuss the direction government should take in radiation education.

Mossman earned a Ph.D. in radiation biology from the University of Tennessee in 1973. Coincidentally, support for his pre-doctoral work at the Oak Ridge National Laboratory was provided by ORAU through a DOE Laboratory Graduate Participant fellowship. Prior to joining Arizona State in 1990, Mossman spent 17 years at Georgetown University where he held a variety of positions, including serving as professor and chairman of the department of radiation science in the graduate school.

Mossman's sabbatical was arranged through ORAU's Office of University and Industry Programs, which seeks out collaborative alliances among member universities, private industry, and government. ORAU has provided technical assistance to CIRRPC since 1984, working closely with CIRRPC's Science Panel and Policy Panel.

SERS Student Studies in Oak Ridge and Geneva, Switzerland

For Kyle Pope the last year has been one of discoveries, new opportunities, and travel. In just 12 short months, Pope has graduated from the University of North Carolina at Charlotte with his bachelor's degree in physics, conducted research with some of the world's leading nuclear physicists in Oak Ridge, Tenn., and Geneva, Switzerland, and begun work toward his doctorate at Yale University.

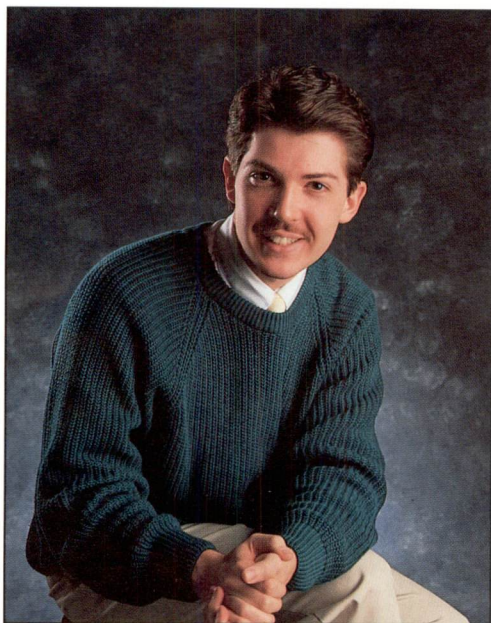
After graduation from UNC-Charlotte, Pope had planned to start graduate school immediately, but acceptance into the national Science and Engineering Research Semester (SERS) program offered him a research opportunity he could not pass up.

Sponsored by the U.S. Department of Energy, SERS offers undergraduate students majoring in environmental, life, or physical science, computer science, engineering, or mathematics an opportunity to work in collaboration with scientists in national laboratories for one semester. Six national laboratories participate in the program including Argonne, Brookhaven, Los Alamos, Lawrence Berkeley, Pacific Northwest, and Oak Ridge.



HEALTH PHYSICS TECHNICIANS FROM ORAU'S ENERGY/ENVIRONMENT SYSTEMS DIVISION COLLECT SOIL, WATER, AND AIR SAMPLES DURING THE COURSE OF RADIOLOGICAL SURVEYS AND VERIFICATION AT DOE SITES ACROSS THE COUNTRY.





Kyle Pope

The Oak Ridge National Laboratory program in which Pope participated is appropriately called the Oak Ridge Science and Engineering Research Semester, or ORSERS. The ORSERS program is administered by ORAU's Science/Engineering Education Division.

Students are provided with a weekly stipend, travel reimbursement, and complimentary housing during their assignments. In most cases, the students also receive academic credit from their home institutions.

During Fall 1989 Pope began his research appointment in ORNL's Physics Division. Under the direction of Dr. Glenn Young and Terry Awes, he assisted in the design and development of

a gamma ray detector for nuclear collision experiments. As the project progressed to the testing stage, the ORNL staff decided it was time to move their research to CERN, the European Organization for Nuclear Research (Conseil Européen pour la Recherche Nucleaire) laboratory in Geneva, Switzerland. Pope was invited to come along and continue his work with them.

For five months, Pope and the ORNL team lived in France and traveled across the border into Switzerland to work at the prestigious CERN laboratory every day. "What we had designed at ORNL, we were actually building and testing at CERN," Pope said. "While I was there we assembled a smaller model of our detector to make sure the full-size detector would work properly when it was built. I also got to work on similar detectors that other teams were constructing for the same experiment."

While the hours were long for his research appointment in Geneva, Pope did manage to get out of the laboratory and see some of the sights. Weekend trips included cities in France, Spain, and Switzerland. "I really enjoyed Spain the most," Pope said. "Although our cultures were different, the people were very open and friendly. It was a lot like home."

One of the extra benefits of his semester at CERN was a marked improvement in his French. "In the laboratory almost everyone spoke English,

but in the surrounding areas the people spoke French," Pope said. "While the language was a problem at first, I ended up learning a lot about the people and their language."

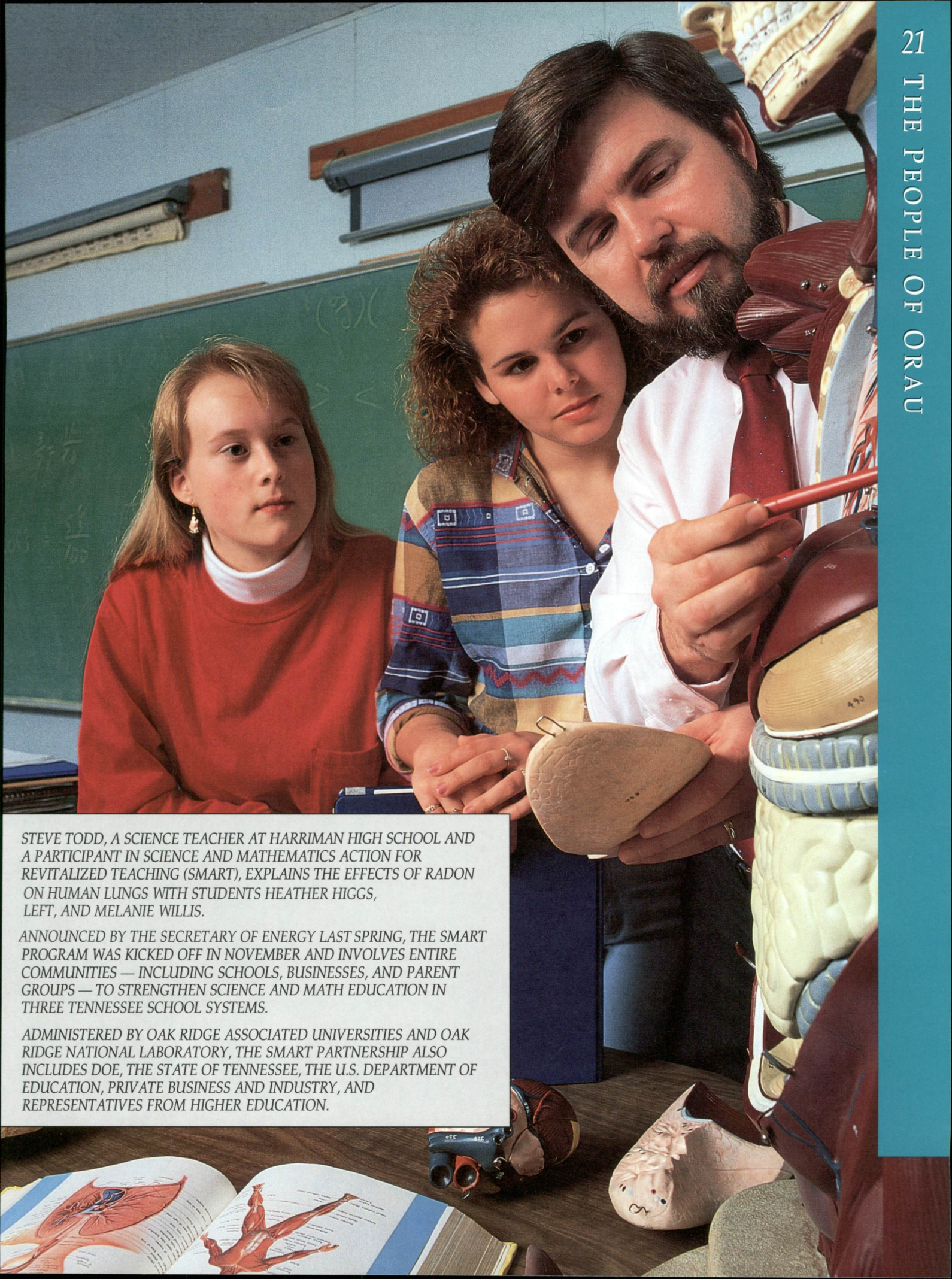
But now, it's back to the books. While still in Switzerland, Pope learned that he had been accepted as a doctoral student at Yale. "I believe that my working in the ORSERS program and the opportunities it offered me at ORNL and CERN have helped greatly in boosting my value as a graduate student," Pope said.

"The whole experience has proven very valuable," he added. "I expect to continue my research and do similar work as a graduate student."

For many of the students in the SERS program, the semester in the laboratory allows them to not only increase their research experience but to examine their choices to see if they will really enjoy the career paths they are following. ORAU program manager Ernestine Friedman said for some students it really opens their eyes to the real world of research.

"In a few cases the students have changed majors or questioned their decisions after spending a semester in the lab," Friedman said. "But in most cases I think it reconfirms their career decisions and excites them to the possibilities that lie ahead."

"If anything I am more committed to my goals of obtaining my Ph.D. in physics...especially experimental nuclear physics, or particle physics," Pope said.



STEVE TODD, A SCIENCE TEACHER AT HARRIMAN HIGH SCHOOL AND A PARTICIPANT IN SCIENCE AND MATHEMATICS ACTION FOR REVITALIZED TEACHING (SMART), EXPLAINS THE EFFECTS OF RADON ON HUMAN LUNGS WITH STUDENTS HEATHER HIGGS, LEFT, AND MELANIE WILLIS.

ANNOUNCED BY THE SECRETARY OF ENERGY LAST SPRING, THE SMART PROGRAM WAS KICKED OFF IN NOVEMBER AND INVOLVES ENTIRE COMMUNITIES — INCLUDING SCHOOLS, BUSINESSES, AND PARENT GROUPS — TO STRENGTHEN SCIENCE AND MATH EDUCATION IN THREE TENNESSEE SCHOOL SYSTEMS.

ADMINISTERED BY OAK RIDGE ASSOCIATED UNIVERSITIES AND OAK RIDGE NATIONAL LABORATORY, THE SMART PARTNERSHIP ALSO INCLUDES DOE, THE STATE OF TENNESSEE, THE U.S. DEPARTMENT OF EDUCATION, PRIVATE BUSINESS AND INDUSTRY, AND REPRESENTATIVES FROM HIGHER EDUCATION.

INDEX To

FINANCIAL STATEMENTS OF OAK RIDGE ASSOCIATED UNIVERSITIES, INC. SEPTEMBER 30, 1990

Report of Independent Accountants	23
Charts: Operating Expenses, Capital Expenditures, and Funding Summary	24
Financial Statements:	
Corporate General and Program Funds:	
Balance Sheets as of September 30, 1990 and 1989	26
Statements of Revenues, Expenses, and Changes in Fund	
Balance for the Years Ended September 30, 1990 and 1989	27
Statements of Changes in Financial Position	
For the Years Ended September 30, 1990 and 1989	28
Department of Energy Contract Fund:	
Balance Sheets as of September 30, 1990 and 1989	29
Statement of Net Reimbursable Operating Expenses	
And Capital Expenditures for the Years Ended September 30, 1990 and 1989	30
Statement of Changes in Fund Balance	
For the Years Ended September 30, 1990 and 1989	31
Notes to Financial Statements	32



Report Of Independent Accountants

*The Board of Directors
Oak Ridge Associated Universities, Inc.*

We have audited the financial statements of Oak Ridge Associated Universities, Inc. as listed in the accompanying index on page 22, as of September 30, 1990 and 1989 and for the years then ended. These financial statements are the responsibility of management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of Oak Ridge Associated Universities, Inc. as of September 30, 1990 and 1989, and the results of its operations and changes in its financial position for the years then ended in conformity with generally accepted accounting principles.

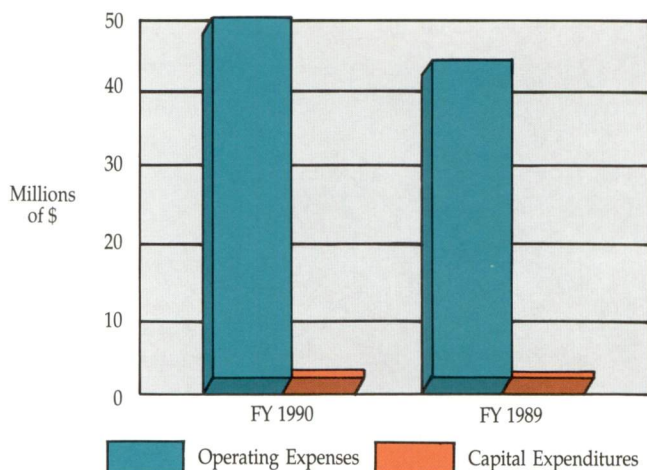
A handwritten signature in cursive script that reads "Coopers & Lybrand".

November 30, 1990

OAK RIDGE ASSOCIATED UNIVERSITIES **OPERATING EXPENSES AND CAPITAL EXPENDITURES**

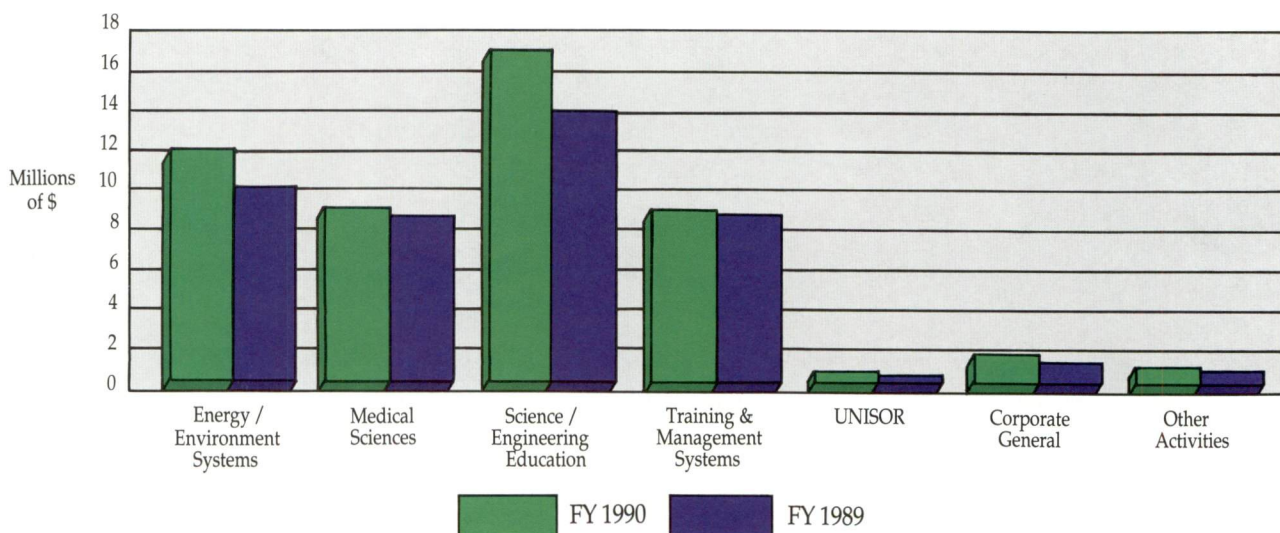
for the years ended September 30, 1990 and 1989

Total Operating Expenses and Capital Expenditures



	(\$ in Thousands)	
	1990	1989
Operating Expenses:		
DOE Contract Fund	\$45,398.1	\$40,321.6
Corporate	2,187.7	2,024.9
Total Operating Expenses	47,585.8	42,346.5
 Total Capital Expenditures		
DOE Contract Fund	636.7	552.3
 Total Operating Expenses and Capital Expenditures	\$48,222.5	\$42,898.8

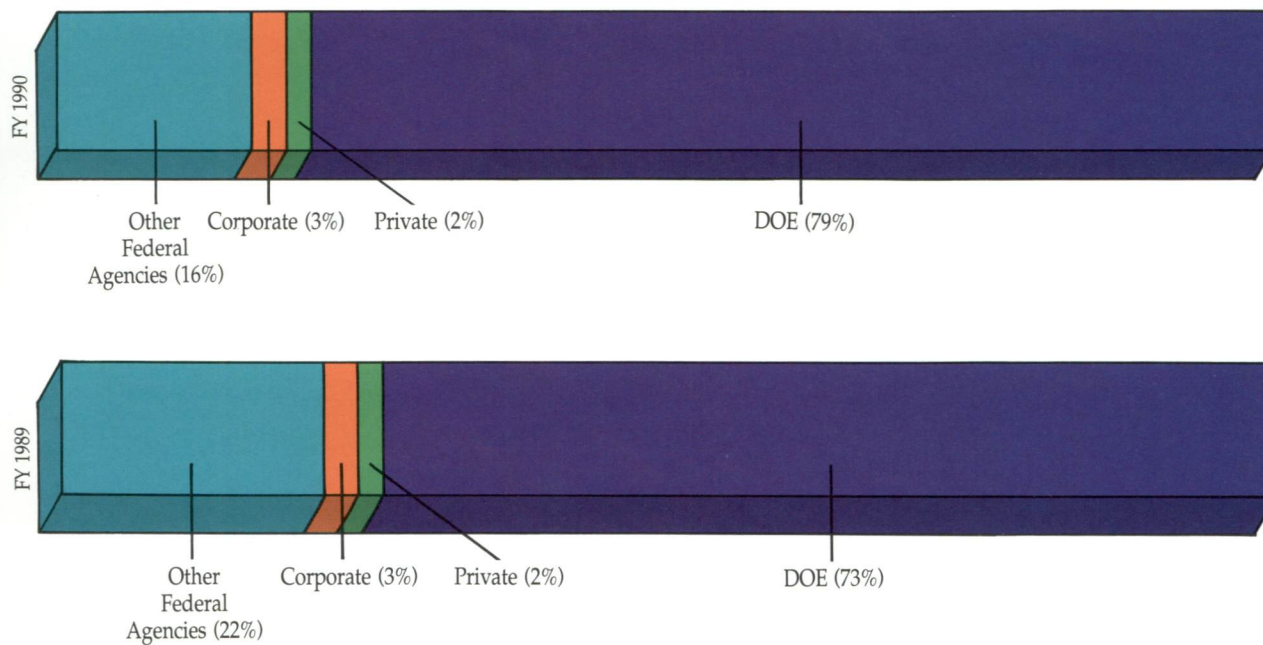
Operating Expenses by Division



	(\$ in Thousands)	
	1990	1989
Energy /Environment Systems Division	\$11,329.4	\$ 9,590.6
Medical Sciences Division	8,504.3	8,265.1
Science /Engineering Education Division	16,440.6	13,508.0
Training & Management Systems Division	8,324.4	8,091.8
UNISOR	479.9	456.1
Corporate General	1,651.4	1,598.7
Other Activities	855.8	836.2
Total Operating Expenses	\$47,585.8	\$42,346.5

OAK RIDGE ASSOCIATED UNIVERSITIES, INC.

Funding Summary
for the years ended September 30, 1990 and 1989



	(\$ in Thousands)	
	1990	1989
Source:		
DOE	\$38,070.1	\$31,115.6
Other Federal Agencies	7,616.7	9,550.0
Private Sector	1,081.0	835.7
Corporate	1,454.7	1,397.5
Total Funding	<u>\$48,222.5</u>	<u>\$42,898.8</u>

**OAK RIDGE ASSOCIATED UNIVERSITIES, INC.
CORPORATE GENERAL AND PROGRAM FUNDS**

Balance Sheets
September 30, 1990 and 1989

	<u>1990</u>	<u>1989</u>
Assets:		
Current assets:		
Cash and short-term investments	\$ 2,545,473	\$ 1,780,216
Accounts receivable and other	<u>712,670</u>	<u>588,942</u>
Total current assets	<u>3,258,143</u>	<u>2,369,158</u>
Long-term investments	<u>1,062,742</u>	<u>1,696,997</u>
Property - at cost	3,845,703	3,696,629
Less accumulated depreciation	<u>(1,788,950)</u>	<u>(1,621,272)</u>
Net property	<u>2,056,753</u>	<u>2,075,357</u>
Total assets	<u>\$6,377,638</u>	<u>\$6,141,512</u>
 Liabilities and fund balances:		
Current liabilities:		
Accounts payable and accrued liabilities	\$1,376,144	\$1,056,731
Deferred revenue:		
Corporate General	55,000	81,527
Program activities	<u>154,109</u>	<u>197,139</u>
Total current liabilities	<u>1,585,253</u>	<u>1,335,397</u>
Fund balances:		
Program activities	<u>305,943</u>	<u>244,975</u>
General fund:		
General undesignated	3,515,649	4,507,410
General designated - property replacement	904,138	
General designated - Marmoset Research Center	<u>66,655</u>	<u>53,730</u>
Total general funds	<u>4,486,442</u>	<u>4,561,140</u>
Total fund balances	<u>4,792,385</u>	<u>4,806,115</u>
Total liabilities and fund balances	<u>\$6,377,638</u>	<u>\$6,141,512</u>

*The accompanying notes are an integral
part of these financial statements.*

**OAK RIDGE ASSOCIATED UNIVERSITIES, INC.
CORPORATE GENERAL AND PROGRAM FUNDS**

**Statements Of Revenues, Expenses, And Changes In Fund Balance
for the years ended September 30, 1990 and 1989**

	General Fund		Program Funds	
	1990	1989	1990	1989
Revenues:				
Membership fees	\$ 67,000	\$ 49,000		
Management fees	907,196	878,172		
Interest	196,543	212,664	\$ 14,298	\$ 15,558
Program revenue	395,612	429,898	579,564	398,756
Total revenues	<u>1,566,351</u>	<u>1,569,734</u>	<u>593,862</u>	<u>414,314</u>
Expenses:				
Personal services	779,106	899,095	166,975	148,127
Travel	169,632	72,791	11,556	9,256
Other expenses	702,724	626,830	357,729	268,788
Total expenses	<u>1,651,462</u>	<u>1,598,716</u>	<u>536,260</u>	<u>426,171</u>
Excess (deficit) of revenues over expenses	(85,111)	(28,982)	57,602	(11,857)
Operating transfers	10,413	53,730	3,366	
Fund balance at beginning of year	<u>4,561,140</u>	<u>4,536,392</u>	<u>244,975</u>	<u>256,832</u>
Fund balance at end of year	<u>\$4,486,442</u>	<u>\$4,561,140</u>	<u>\$305,943</u>	<u>\$244,975</u>

*The accompanying notes are an integral
part of these financial statements.*

**OAK RIDGE ASSOCIATED UNIVERSITIES, INC.
CORPORATE GENERAL AND PROGRAM FUNDS**

Statements Of Changes In Financial Position
for the years ended September 30, 1990 and 1989

	<u>General Fund</u>		<u>Program Funds</u>	
	<u>1990</u>	<u>1989</u>	<u>1990</u>	<u>1989</u>
Financial resources provided (used) by operations:				
Excess (deficit) of revenue over expenses	\$(85,111)	\$ (28,982)	\$ 57,602	\$ (11,857)
Items not affecting working capital:				
Provision for depreciation	<u>153,457</u>	<u>149,662</u>	<u> </u>	<u>8,800</u>
Working capital provided (used) by operations	68,346	120,680	57,602	(3,057)
Decrease in long-term investments	533,330		100,925	
Proceeds from sale of property	<u> </u>	<u>34,310</u>	<u> </u>	<u> </u>
Total financial resources provided (used)	<u>601,676</u>	<u>154,990</u>	<u>158,527</u>	<u>(3,057)</u>
Financial resources applied to:				
Property additions	(121,074)	(117,063)		
Increase in long-term investments		(141,753)		(100,925)
Corporate support-technology transfer	<u>(3,366)</u>	<u> </u>	<u>3,366</u>	<u> </u>
Total financial resources applied	<u>(124,440)</u>	<u>(258,816)</u>	<u>3,366</u>	<u>(100,925)</u>
Increase (decrease) in working capital	<u>\$477,236</u>	<u>\$(103,826)</u>	<u>\$161,893</u>	<u>\$(103,982)</u>
Changes in working capital components:				
Increase (decrease) in current assets:				
Cash and short-term investments	\$547,681	\$(169,953)	\$217,576	\$541,354
Accounts receivable and other current assets	(27,798)	255,287	151,526	74,276
(Increase) decrease in current liabilities:				
Accounts payable and accrued liabilities	(69,174)	(156,633)	(250,239)	31,572
Deferred revenue	<u>26,527</u>	<u>(32,527)</u>	<u>43,030</u>	<u>(751,184)</u>
Increase (decrease) in working capital	<u>\$477,236</u>	<u>\$(103,826)</u>	<u>\$161,893</u>	<u>\$(103,982)</u>

*The accompanying notes are an integral
part of these financial statements.*

OAK RIDGE ASSOCIATED UNIVERSITIES, INC.
DEPARTMENT OF ENERGY CONTRACT FUND

Balance Sheets
September 30, 1990 and 1989

	1990	1989
Assets:		
Current assets:		
Cash	\$ 84,776	\$ 134,876
Accounts receivable and other	2,091,528	2,515,011
Total current assets	<u>2,176,304</u>	<u>2,649,887</u>
Property - at cost	15,937,620	15,372,945
Less accumulated depreciation	<u>(10,079,661)</u>	<u>(9,644,173)</u>
Net property	<u>5,857,959</u>	<u>5,728,772</u>
Total assets	<u>\$ 8,034,263</u>	<u>\$ 8,378,659</u>
Liabilities and fund balance:		
Current liabilities	\$ 5,140,481	\$ 4,161,765
Fund balance	<u>2,893,782</u>	<u>4,216,894</u>
Total liabilities and fund balance	<u>\$ 8,034,263</u>	<u>\$ 8,378,659</u>

*The accompanying notes are an integral
part of these financial statements.*

**OAK RIDGE ASSOCIATED UNIVERSITIES, INC.
DEPARTMENT OF ENERGY CONTRACT FUND**

**Statements Of Net Reimbursable Operating Expenses And Capital Expenditures
for the years ended September 30, 1990 and 1989**

	<u>1990</u>	<u>1989</u>
Operating Expenses:		
Personal services	\$35,532,168	\$31,843,969
Travel	2,240,225	2,088,103
Other expenses	<u>7,625,731</u>	<u>6,389,498</u>
Total operating expenses	45,398,124	40,321,570
Costs recovered from others	<u>20,571,257</u>	<u>21,195,932</u>
Net reimbursable operating expenses	24,826,867	19,125,638
Capital expenditures	<u>636,690</u>	<u>552,326</u>
Net reimbursable operating expenses and capital expenditures - DOE contract	<u>\$25,463,557</u>	<u>\$19,677,964</u>

*The accompanying notes are an integral
part of these financial statements.*

OAK RIDGE ASSOCIATED UNIVERSITIES, INC.
DEPARTMENT OF ENERGY CONTRACT FUND

Statements Of Changes In Fund Balance
for the years ended September 30, 1990 and 1989

	1990	1989
Fund balance at beginning of year	\$ 4,216,894	\$ 5,640,739
Additions:		
U.S. Department of Energy (DOE) contribution:		
Draws on line of credit provided by DOE with the Federal Reserve Bank	39,151,556	35,680,031
Costs reimbursed by other federal agencies	(7,305,579)	(9,237,017)
Net program and miscellaneous costs transferred between ORAU and other DOE contractors	(7,841,903)	(7,612,791)
Other property transferred between ORAU and federal agencies	29,494	(436,572)
Physical inventory adjustment	48,699	
Net DOE contribution	24,082,267	18,393,651
Capital expenditures:		
Capital budget items	636,690	552,326
Operating funds (lease-purchase of equipment)	13,700	11,080
Total capital expenditures	650,390	563,406
Total additions	24,732,657	18,957,057
Deductions:		
Net reimbursable operating expenses and capital expenditures	25,463,557	19,677,964
Current provision for depreciation of U.S. government property	592,212	585,186
Property retirements, net of salvage		117,752
Total deductions	26,055,769	20,380,902
Fund balance at end of year	\$ 2,893,782	\$ 4,216,894

*The accompanying notes are an integral
part of these financial statements.*

NOTES TO FINANCIAL STATEMENTS

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES:

Affiliations:

Oak Ridge Associated Universities, Inc. (ORAU) is a private, not-for-profit association of colleges and universities. It is a contractor of the U.S. Department of Energy (DOE), conducting research and educational programs in the areas of energy, health, training, and the environment for the Department of Energy, member institutions, other colleges and universities, and other private and governmental organizations.

The accounts of ORAU are maintained separately from those of the United States Government as represented by activities under contract with DOE. Accordingly, the accompanying financial statements reflect this separation of accountability.

The costs of programs administered by ORAU under the sponsorship of DOE and other agencies are subject to audit at the sponsor's direction and, accordingly, may be subject to disallowance.

ORAU has custody of the assets shown on the balance sheet, but title to those assets included under the DOE Contract Fund rests with the United States Government.

Revenue Recognition:

Revenue under the DOE Contract Fund and certain small corporate program funds is recognized in an amount equivalent to current operating expenses. Revenue under corporate fixed-fee contracts and agreements of professional training courses administered by the Training and Management Systems Division, UNISOR, Marmoset Research Center, and technology transfer activities is recognized ratably over the terms of the contract and agreements.

Property and Equipment:

The costs of property and equipment obtained for use under the DOE Contract Fund are shown as current expenditures against the capital expenditure budget in order to match such expenditures with reimbursement as is required under the contract. Because the usefulness of these items is expected to extend beyond the current period, the costs are also shown as additions to property and to fund balance. To reflect the anticipated deterioration and obsolescence, depreciation is computed using the straight-line method over the estimated useful life and is charged to fund balance. Gains and losses from disposal of this property and equipment are also accounted for through fund balance.

Depreciation of items of corporate property and equipment is computed on a straight-line basis over the estimated useful lives of the related assets and reflected as a current operating expense.

Investments:

Investments, consisting of certificates of deposit, money market accounts, GNMA's, and United States Treasury obligations, are carried at amortized cost. Management's intention is to hold investments to maturity. Those maturing within one year from fiscal year-end are presented as short-term and those maturing after one year are presented as long-term in the accompanying balance sheets.

2. CASH AND INVESTMENTS:

Corporate cash, short-term investments, and long-term investments have been allocated between the General and Program Funds as follows:

	1990		1989	
	Cost	Market	Cost	Market
Cash and short-term investments:				
General Fund	\$1,396,386	\$1,399,224	\$ 930,156	\$ 928,627
Program Funds:				
UNISOR	176,700	176,946	170,559	170,559
UNISOR - RMS	966,387	968,060	658,501	660,033
Medical Sciences Division	6,000	6,000	6,000	6,000
Mellon Foundation			15,000	15,000
	<u>\$2,545,473</u>	<u>\$2,550,230</u>	<u>\$1,780,216</u>	<u>\$1,780,219</u>
Long-term Investments:				
General Fund	\$1,062,742	\$1,135,069	\$1,596,072	\$1,720,459
Program Funds:				
UNISOR			19,843	20,119
UNISOR - RMS			81,082	80,474
	<u>\$1,062,742</u>	<u>\$1,135,069</u>	<u>\$1,696,997</u>	<u>\$1,821,052</u>

3. PROPERTY:

Property consisted of the following:

	1990		1989	
	Corporate General	DOE Contract Fund	Corporate General	DOE Contract Fund
Buildings	\$3,531,174	\$10,877,549	\$3,438,861	\$10,316,575
Equipment	158,348	4,545,079	102,929	4,373,025
Land and other	156,181	448,949	154,839	426,954
	<u>3,845,703</u>	<u>15,871,577</u>	<u>3,696,629</u>	<u>15,116,554</u>
Construction in progress		66,043		256,391
	<u>\$3,845,703</u>	<u>\$15,937,620</u>	<u>\$3,696,629</u>	<u>\$15,372,945</u>

Depreciable Lives

	Corporate Funds	Department of Energy Contract Fund
Buildings	23-38 years	30-50 years
Equipment	4-6 years	7-22 years
Other	3-20 years	15-40 years

4. EMPLOYEE RETIREMENT PLAN:

The employees of ORAU are required upon employment and attaining 21 years of age to participate in a retirement plan made available through the Teachers Insurance and Annuity Association and the College Retirement Equities Fund. The plan requires individual employees to purchase retirement annuities by contributing a percentage of their monthly salary. ORAU supplements each employee's contribution by voluntarily providing an additional percentage of the employee's monthly salary. The accompanying financial statements reflect contributions by ORAU of \$52,061 and \$1,169,520 for employee retirement under Corporate and DOE Contract Activities, respectively for 1990, and \$49,166 and \$1,041,475, respectively for 1989.

5. LEASE:

ORAU leases certain office space under a noncancellable operating lease agreement with an initial term expiring in April 1991. The lease contains renewal options and an escalation clause which requires payment of additional rent to the extent of increases in certain consumer price indices. Rental expense was \$259,936 for 1990 and \$260,802 for 1989. Expected rental on this operating lease for the seven-month period, October 1990 through the end of the lease, April 1991, is \$153,839.

6. MARMOSET RESEARCH PROGRAM (MARCOR):

As of December 1, 1988, the Marmoset Research Center, Oak Ridge (MARCOR) was reorganized into a corporate operation under the joint sponsorship of ORAU and the University of Tennessee. Operational direction of the program was assigned to ORAU's Office of University and Industry Programs. The goal of MARCOR is to become fully supported by university and industry sponsors who have an interest in marmoset-related research. ORAU and the University of Tennessee agreed to jointly underwrite any losses in order to promote a successful transition of MARCOR. Effective October 1, 1989, the University of Tennessee changed its status from partner to that of a dues paying member of MARCOR. Fiscal year 1990 and future losses will be solely the responsibility of ORAU.

7. RECOIL MASS SPECTROMETER - UNISOR:

ORAU agreed in January 1989 to act as fiduciary to receive and invest the funds to construct a recoil mass spectrometer (RMS) for the Holifield Heavy Ion Research Facility at the Oak Ridge National Laboratory. As of September 30, 1990, funding of \$882,000 has been received, including \$50,000 of a \$150,000 total commitment from ORAU, \$655,000 from the University of Tennessee and \$155,000 from Vanderbilt University. Cumulative interest earned on investment of these funds totaled \$86,537 as of September 30, 1990. Total investments and accrued interest receivable related to the project totaled \$968,537 at September 30, 1990. As of September 30, 1990, bids from potential manufacturers of the RMS are being evaluated. Based on preliminary pricing, construction may be delayed until additional financial support can be obtained.

8. CORPORATE GENERAL DESIGNATED FUNDS:

Corporate general fund balance designated for property replacement totaling \$904,138 includes 50% of accumulated corporate building depreciation through September 30, 1989, and 100% of corporate building depreciation beginning October 1, 1989. These designated funds will be used for major corporate building betterments and replacements. Funds designated for the Marmoset Research Center totaling \$66,655 represent the book value of equipment assigned to the Marmoset Research Center.

9. CORPORATE TECHNOLOGY TRANSFER ACTIVITIES:

During 1990, corporate technology transfer activity increased. Management approved changing these activities from corporate cost reimbursement programs to corporate self-supportive programs carrying their balance forward in order to support future technology transfer activities. Therefore, deferred revenue prior to 1990 totaling \$46,012, was included in 1990 program revenue for Technology Transfer Activities.

10. TAX STATUS:

ORAU is classified as a 501 (c) (3) not-for-profit organization by the Internal Revenue Service and, as such, is exempt from federal income taxes.

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*Resigned July 1990
Replaced by
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President/Professor of
Medicine, Medical College
of Georgia

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Donald L. Hagengruber

Vice President,
Environmental, Safety, and
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Vice President and Chairman

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Systems, Eugene H. Spejewski,
Vice President and Chairman

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Vice President and Chairman

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Officer, Jon M. Veigel

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James E. Drewry

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Vice President, University and
Industry Programs,
William A. Goodwin (Acting)

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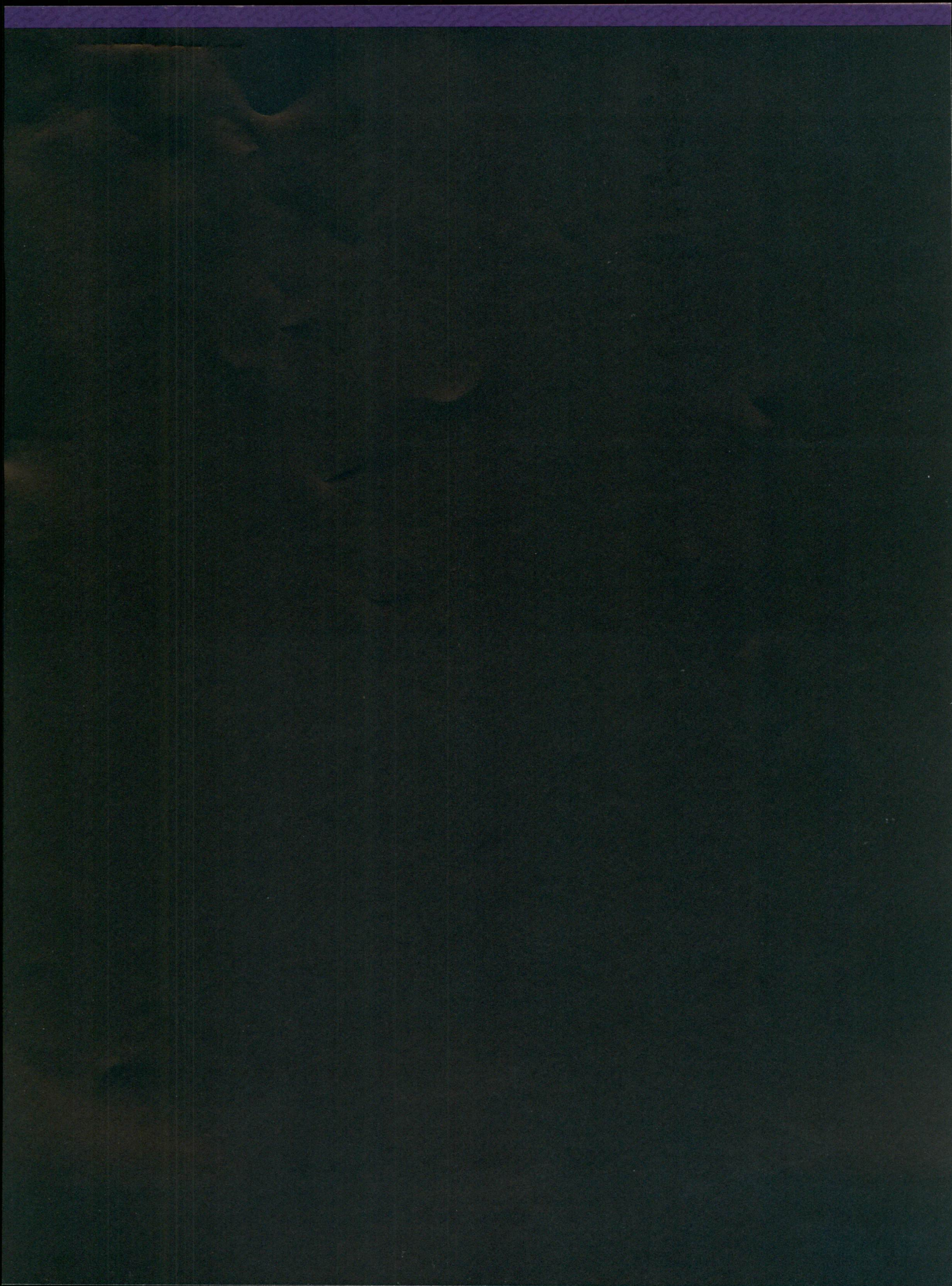
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and State University,
Ernest R. Stout

West Virginia University,
Richard A. Bajura

College of William and Mary,
Herbert O. Funsten

*Campus Representative

**Associate Representative



or
w

"CORRESPONDENCE TRACKING"

TYPE: ACTION

DOCUMENT NUMBER: 9120627

FROM: HENDERSON, Albert: HENDERSON ASSOCIATES

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 02/27/91

SUBJECT: REQUEST TO MAKE LIBRARY FUNDING A MANDATORY DIRECT
CHARGE RELATED TO RESEARCH GRANTS, RATHER THAN AN
UNACCOUNTABLE FEATURE OF INDIRECT OVERHEAD EXPENSE.

ASSIGNED TO: Thomas Ratchford

ACTION REQUIRED: FOR DAB SIGNATURE

SENDER'S DUE DATE:

OSTP DUE DATE:

03/24/91

DATE COMPLETED:

3/11/91

COPIES TO: D. Allan Bromley

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 03/04/91

FILE: EDUCATION

THE WHITE HOUSE
WASHINGTON

March 11, 1991

Dear Mr. Henderson:

I thank you for your very thoughtful letter calling attention to the needs of academic research libraries. There is no question but that the excellence of university libraries provides an essential foundation to our educational and research institutions. Whether libraries should be funded as direct or indirect charges is a subject of ongoing discussion, as are other considerations pertaining to indirect costs.

I appreciate the information you have provided and will consider it carefully as part of our deliberations.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "D. Allan Bromley", written in a cursive style.

D. Allan Bromley
Assistant to the President
for
Science and Technology

Mr. Albert Henderson
President
Henderson Associates
2423 Noble Station
Bridgeport, Connecticut 06608

9120627
RECEIVED

February 27, 1991

D. Allen Bromley
Office of Science &
Technology Policy
Old Executive Office Building
Washington, DC 20506

31 MAR 4 P2:39

OFFICE OF THE
DIRECTOR

Dear Dr. Bromley:

I would like to make your Office aware of the needs of academic research libraries, most of which have suffered greater financial cuts than science research projects. All science research flows from a review of the literature and ends with publication of peer-reviewed results. Excellent libraries are necessary for excellent research. Yet, as a percentage of either total academic expenditures or total R&D expenditures, spending for library materials has decreased 25% over the last 20 years while the number of research papers has constantly increased. In today's dollars, academic libraries have \$295 million less than they had in 1970 to buy books and periodicals.

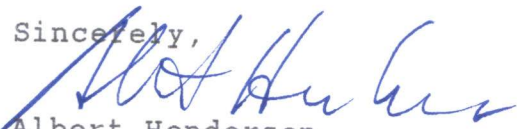
I call your attention to the indirect costs claimed by universities receiving research grants. In particular, the fact that some of this money is supposed to support the library is important to my current research. The underfunding of science libraries has created animosity directed by librarians towards researchers and publishers. Worse, some editors of science journals - for the first time competing for library renewals - have occasionally lost their professional dignity.

Leon M. Lederman's report, SCIENCE. THE END OF THE FRONTIER?, notes the average overhead percentage charge climbed from 16% in 1966 to 28% in 1986. We used this statistic to estimate the overhead dollars involved in total Federal academic R&D funding and produced the enclosed graph. While universities take more for indirect expenses, it seems clear that the promise of support for libraries has not been kept by many institutions.

I hope you will be able to make library funding a mandatory direct charge related to research grants, rather than an unaccountable feature of indirect overhead expense.

I have some additional data and analyses, if you're interested.

Sincerely,


Albert Henderson

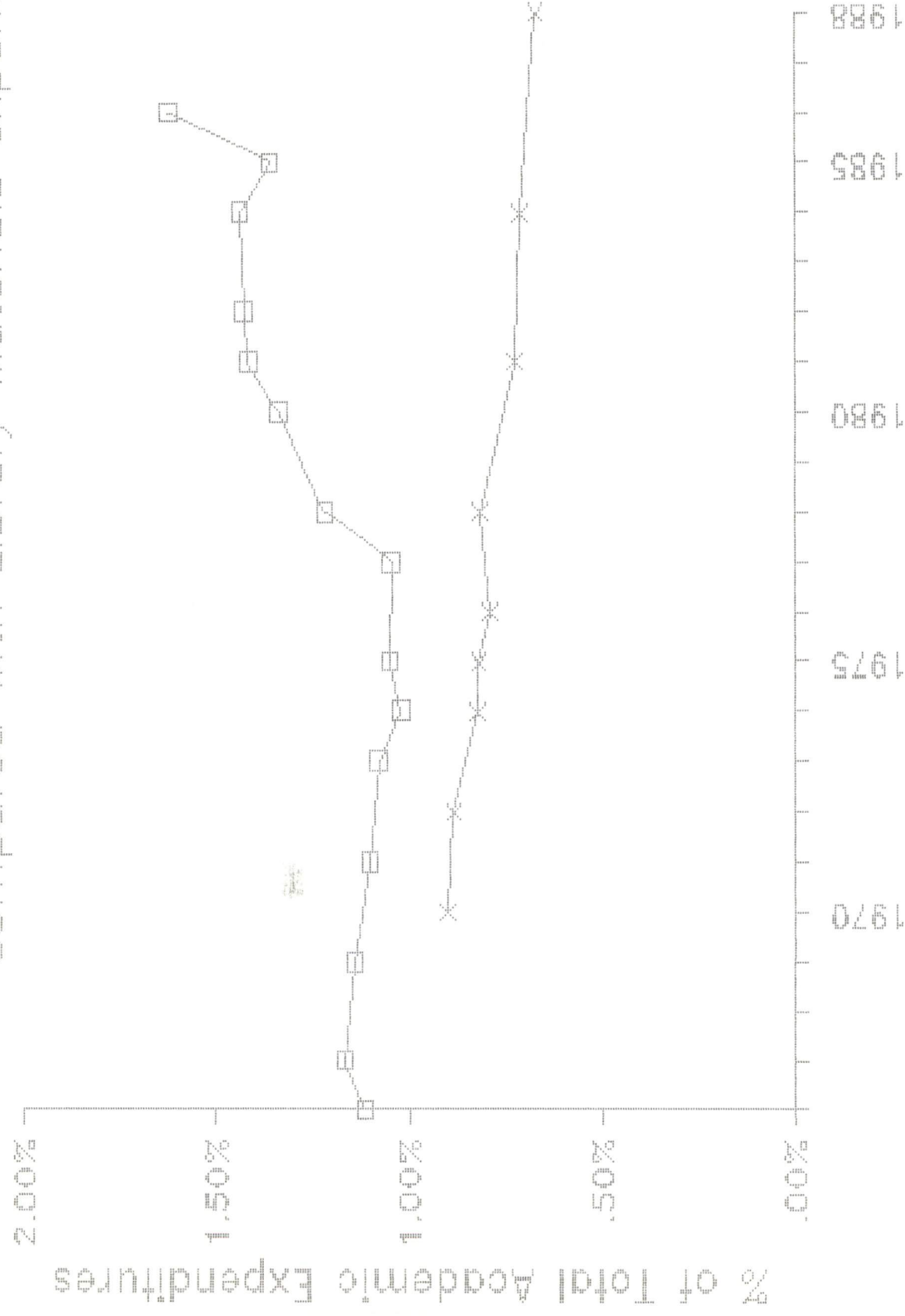
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encl:

P.S. I'm also enclosing a reprint of my article in Book Research Quarterly, indicating (table 5) how far the buying power of many university libraries has slipped. Also enclosed find some additional background on Henderson Associates.

Estimated Fed'l Academic R&D Grant Overhead compared with Library Materials expenditure

—□— Overhead
—x— Library Materials



R & D Overhead charges supporting libraries less

ALBERT HENDERSON

WHY HIRE CONSULTANTS?

The major professional associations of consultants agree the following reasons are foremost given by clients:

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Present new ideas and a fresh approach.

Possess the ability to diagnose problems and evaluate solutions.

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Supplement present skills of staff and management.

Implement systems and train employees.

Selected Accomplishments:

Developed major publications and book service program for a national scientific and educational society, including every phase — from product development through marketing, operations, warehouse, fulfillment, and customer service.
Changed product mix and marketing to take advantage of desirable government contract business.
Obtained desired legislation for trade association.
Developed corporate strategy to overcome major financial problems and sell business at a profit.
Designed thousands of marketing programs for books, periodicals, and reference books.
Identified a major market opportunity for a leading publisher of trade periodicals.

Developed an innovative "electronic publishing" product for a national telecommunications company.
Developed recommendations for refinancing a non-profit organization using a partly-owned financial subsidiary.
Developed a plan for extensive revision of membership processing and service for an international association.
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STRATEGIC PLANNING: Analyses of goals, direction, opportunities, resources.

HENDERSON ASSOCIATES offers management and marketing expertise in publishing, distribution and communications.

ALBERT HENDERSON'S career spans over 20 years during which he was Director of Publications for a national professional engineering society, Vice President of a major international publisher of books and journals in science and technology, Vice President and Treasurer of an important

bookseller and distributor, Executive Vice President of a midwest manufacturing company, and Editor for a leading publisher of scholarly reprints. In addition, he served as Director of an industry association and was invited as guest lecturer at SUNY-Albany. He is listed in WHO'S WHO IN ASSOCIATION MANAGEMENT and WHO'S WHO IN SPECIAL LIBRARIES. His biography appears in WHO'S WHO IN AMERICA.

More Library Materials Budget Justifications

Albert Henderson

In the Winter 1990 issue of BRQ, Frederick C. Lynden outlined a strategy for justifying library materials budgets based on his experience at Brown University. Albert Henderson elaborates on this process by offering three additional arguments to justify increased funding at research libraries. These arguments are based on the accelerating publication rate, the shrinking of library budgets as a percentage of GNP, and the consequences for research of inadequate library holdings.

Having listened to the learned opinions of librarians and scholars for many years, I was very interested to read "Library Materials Budget Justifications," by Frederick C. Lynden in the Winter 1990 issue of *Book Research Quarterly*. Lynden outlines an elaborate and sophisticated process. He shares with most of the academic/research community a losing and sometimes bitter battle for a realistic level of funding to have the publications with which all good research begins and ends. Unfortunately none of us has seen any real money since Congress tried to close the Missile Gap. I think it is urgent we try to reverse the trend.

I would like to offer three sets of new arguments to justify increased funding. The three are interrelated and, from my perspective, have been overlooked by most librarians and their advisors.

While Lynden mentions the publication rate for scholarly materials, he provides no numbers. One can understand this. His focus is local. At Brown or any other university the creation of a new program, such as computers and information science or Japanese studies, will have a major impact on one year's budget but not necessarily the next. Perhaps the requests and evaluations made by local selectors and departments are sometimes subjective, idiosyncratic, or manipulated—particularly when department heads are warned by their deans not to ask for "too much."

The publication rate for scholarly materials has increased exponentially since the Royal Society issued its first *Philosophical Transactions* in 1665, and it shows no signs of stopping. Derek J. de Solla Price noted in *Science Since Babylon* that both technical papers published and the number of technical graduates has doubled every 15 years for 300 years. That's an average annual increase of only 5 percent. *Engineering Information's* input activity clearly

Albert Henderson, president of Henderson Associates, is a consultant to scholarly and professional publishers. He was previously an editor with Johnson Reprint and vice-president for marketing and production with Pergamon Press. Address for correspondence: 2423 Noble Station, Bridgeport, CT 06608.

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Articles, reviews, and letters published in Book Research Quarterly, Office Systems, Small Press, Scholarly Publishing, Circulation Management, Online Review, Association Management, EPB: Electronic Publishing and Bookselling, Chronicle of Higher Education, CBE Views, Library Journal, Marketing News, etc.

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9120581

FROM: FISK, L.A.: NASA

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 02/26/91

SUBJECT: NASA'S GRADUATE FELLOWSHIP PROGRAMS.

ASSIGNED TO:

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: Thomas Ratchford
D. Allan Bromley

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 02/28/91

FILE: EDUCATION



National Aeronautics and
Space Administration

Washington, D.C.
20546

9120581

RECEIVED FEB 26 1991

91 FEB 28 P 4: 29

OFFICE OF THE
DIRECTOR

Reply to Attn of: S

Honorable D. Allan Bromley
Assistant to the President
for Science and Technology and
Director, Office of Science and
Technology Policy
Executive Office of the President
Washington, DC 20506

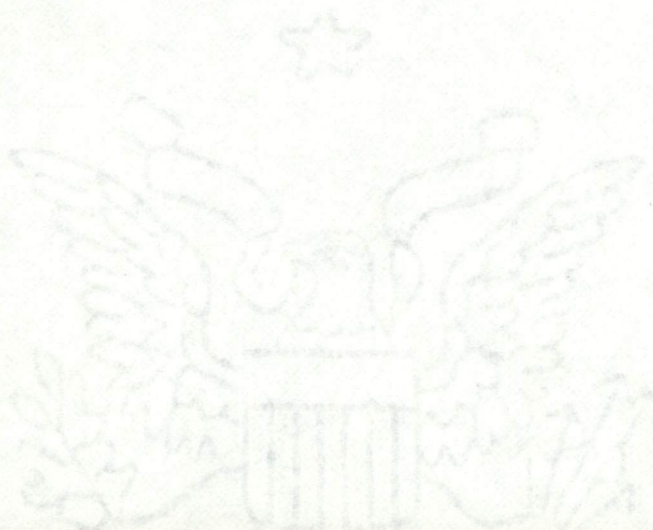
Dear Dr. Bromley:

During discussions at NASA on February 15, 1991, you expressed an interest in learning about NASA's graduate fellowship programs. Enclosed for your information is a one-page summary of the NASA Graduate Student Researchers program, which currently supports over 500 graduate fellowships at over 160 U.S. universities, and a copy of the full brochure on the program. NASA also support additional fellowships under the Global Change Research Fellowship, Historically Black Colleges and Universities, and National Space Grant College and Fellowship programs.

We would be pleased to provide you or your staff with more information on NASA programs in support of graduate students if you wish.

Sincerely,

L. A. Fisk
Associate Administrator for
Space Science and Applications



GRADUATE STUDENT RESEARCHERS PROGRAM

BACKGROUND

- INITIATED IN 1980
- DOUBLED NEW STARTS TO 80 PER YEAR IN 1985
- ADDED UNDERREPRESENTED MINORITY FOCUS COMPONENT IN 1987
 - \$2M PER YEAR FOR MINORITY STUDENTS
 - PRINCIPAL INVESTIGATORS ON NASA GRANTS USED TO RECRUIT AND MENTOR PROMISING BLACKS, HISPANICS, AMERICAN INDIAN AND PACIFIC ISLANDER STUDENTS

PROGRAM DESCRIPTION

- SUPPORTS U.S. GRADUATE STUDENTS PURSUING ADVANCED DEGREES IN NASA RELATED FIELDS
- THREE YEAR COMMITMENT TO MS OR PHD DEGREE
- SUPPORT CURRENTLY AT \$22,000 PER YEAR
 - \$16,000 STUDENT STIPEND
 - \$ 3,000 STUDENT ALLOWANCE
 - \$ 3,000 UNIVERSITY ALLOWANCE
- STUDENTS SELECTED BY NASA FIELD CENTERS REQUIRED TO SPEND PART OF EACH YEAR IN RESIDENCE AT CENTER. THIS PERIOD EXPOSES STUDENT TO NASA FACILITIES, PERSONNEL, AND THE ENVIRONMENT FOR CONDUCTING RESEARCH.
- STUDENTS SELECTED BY HEADQUARTERS OFFICE OF SPACE SCIENCE AND APPLICATIONS ATTEND AN ANNUAL CONFERENCE TO PRESENT RESEARCH PAPERS TO EACH OTHER AND TO HEADQUARTERS OFFICIALS.

FY 90 PROGRAM

STUDENTS

- 523 STUDENTS AT 162 UNIVERSITIES
- 256 SCIENCE FIELDS
- 267 ENGINEERING FIELDS

FY 91 BUDGET

- \$6.7M-GSRP
- \$2.2M-GSRP(UNDERREPRESENTED MINORITY FOCUS)

GLOBAL CHANGE RESEARCH FELLOWSHIPS

- STRUCTURE SAME
- DISCIPLINES RESTRICTED TO GLOBAL CHANGE
- E.G., ATMOSPHERIC CHEMISTRY AND PHYSICS, GEOLOGY, ECOSYSTEM DYNAMICS
- INITIATED IN FY 90
 - 37 IN FY 90
 - 50 IN FY 91
 - 150 STEADY STATE

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9120601

FROM: GENEL, Myron: YALE UNIVERSITY

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 02/25/91

SUBJECT: THE FINAL REPORT FROM THE AAMC TASK FORCE ON
PHYSICIAN SUPPLY ENTITLED, "SUPPLYING PHYSICIANS FOR
FUTURE NEEDS".

ASSIGNED TO:

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: D. Allan Bromley
Thomas Ratchford
Life Sciences

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 03/04/91

FILE: P-EDUCATION * Life Sciences

Yale University

February 25, 1991

D. Allan Bromley, Ph.D.
Assistant to the President for Science & Technology
Director, Office of Science & Technology Policy
Old Executive Office Building
17th Street & Pennsylvania Avenue, N.W.
Washington, DC 20506

Office of Government and Community Affairs

School of Medicine
Sterling Hall of Medicine
333 Cedar Street
P.O. Box 3333

New Haven, Connecticut 06510-8056

Myron Genel, M.D.

Associate Dean

Campus address:

1202 SHM

333 Cedar Street

Telephone:

203 785-6019

FAX:

203 785-7208

RECEIVED
31 MAR 1 4:51
OFFICE OF THE
DIRECTOR

Dear Allan:

Per our conversation last Wednesday en route, circuitously, to National Airport, I am enclosing a copy of the final report from the AAMC Task Force on Physician Supply entitled "Supplying Physicians for Future Needs". The report, which was released last fall, is the product of almost four years of research and deliberations within the Task Force Steering Committee and its four subcommittees and reflects considerable discussion of the task force interim conclusions with the Association's membership and governance.

I call your attention to Part I of the report, which provides an excellent historical and statistical background as well as an executive summary of the task force conclusions. Particularly relevant to our discussion Wednesday and for the upcoming spring meeting of the Council of Academic Societies next month in Savannah is Part IV, the 35 page report of the Subcommittee on Implications of Physician Supply Issues on Programs for the Education of Biomedical Scientists, chaired by David Korn, Vice President and Dean of the Stanford Medical School. The subcommittee's conclusions and recommendations begin on page 26 of this section and should be of interest to you and your staff.

I anticipate that many of these themes will be elaborated upon in Savannah March 25-27 during the spring meeting of the Council of Academic Societies built around the theme "Recruiting and Nurturing Young Faculty and Investigators". I look forward to your keynote address Monday evening, expecting that it will provide a provocative prologue for our discussions and hope that you can remain with us for a portion of the meeting which follows. I certainly hope that your travel arrangements will prove more successful than those we experienced from Bridgeport last week.

With best regards,



Myron Genel, M.D.
Professor of Pediatrics
Associate Dean
Chairman, Council of Academic Societies, AAMC

MG:pac

cc: Robert G. Petersdorf, M.D., President, AAMC

Thomas E. Malone, Ph.D., Vice President for Biomedical Research, AAMC

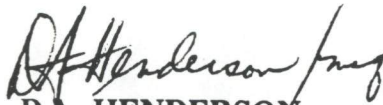
Enclosure

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

March 11, 1991

MEMORANDUM FOR D. ALLAN BROMLEY

FROM:


D.A. HENDERSON

SUBJECT:

COMMENTS ON AAMC REPORT

I have read the AAMC Report (sent to you by Myron Genel at Yale) on "Supplying Physicians for Future Needs" chaired by Dan Tosteson. It is basically descriptive and offers no new and illuminating insights nor any policy options which are controversial or seriously address problems.

As preface to the piece on research, it points out that there are now 597,000 physicians; by 2000, there will be 708,600 (an increase from 239/100,000 to 264/100,000). It is estimated (per the report) that each added physician increases the annual cost of health care by \$800,000 per annum. The Committee concludes that because it cannot document that unnecessary procedures are being done, it "does not conclude there is an impending surplus" whatever other bodies may believe. From the tenor of the report, however, it is clear that there is great unease.

Applicants to medical schools fell sharply from 42,000 in 1975 to 29,000 in 1990 but the number appears to be stabilizing. Matriculants, however, remained essentially constant over the past decade at about 17,000. Numbers of faculty increased from 50,000 in 1980 to 70,000 in 1988. Almost all growth is in the chemical sciences.

Most medical specialties are deemed to be in balance or in surplus (most surgical specialties). There are a few shortage areas -- e.g., psychiatry, preventive medicine, and emergency medicine -- and there is a belief that many more primary care physicians should be trained. Nevertheless, the proportion of physicians trained in primary care decreased by almost half between 1981 and 1989. All schools are enjoined to do better.

David Korn's Committee on Programs for the Education of Biomedical Scientists, to which your attention is drawn, stresses the importance of academic medical centers as the principal focus for biomedical research and for Ph.D. training and emphasizes their role in advancing the profession during a time of exponential growth in knowledge. It is noted that this research effort is concentrated with 40 of 127 schools receiving 72% of all Federal research support. The growth of Federal support is noted in pointing out that the National Institutes of Health (NIH) budget grew more than 250-fold (in constant dollars) between 1945 and 1990; and grew in current dollars from about \$3.5 billion in 1982 to \$7.5 billion in 1989.

The Committee highlights reasons for the current stress:

1. Attenuation in the rate of increase in Federal funding coincides with a sharp upturn in demand resulting from the excitement generated by the new biology. It is noted that industrial support has been "sporadic, limited to narrowly focused projects, and circumscribed by high proprietary protections with relatively little funding for broad basic research." It was hoped this might change.
2. Obsolete facilities, equipment and instrumentation result from a 20-year Federal aversion to financing construction, renovation, etc. Notably, such funds as have been made available (\$270 million in FY '88 and \$203 million in FY '89) are almost all earmarked by Congressional committees.
3. Training programs have diminished in number and stipend levels have decreased. Training as a percentage of NIH's budget decreased from about 5% (1977-1981) to 3.5-4.0% (1984 to present) and training positions decreased from 13,000 in FY '71 to about 10,500 today. Diminishing numbers of physicians in post-doctoral research positions became apparent in 1975 but is beginning to rise today.

The Committee concludes by noting that research investments to date have been highly productive but that the accomplishments need to be better understood by the public especially at a time when the national economy is experiencing limited growth. The view is expressed that it is timely to explore the Federal government's commitment to its role as principal patron of basic science and the vitality of its relationship with academe. Also pointed out is the need to maintain a continuing infusion of fresh scientific talent, to sustain and expand the effort.

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9120571

FROM: MERBACHER, Eugen: THE UNIVERSITY OF NORTH CAROLINA

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 02/25/91

SUBJECT: COMMENTS CONCERNING THE PRESIDENT'S BUDGET FOR 1992
AND A MEMO TO APS PHYSICS PLANNING COMMITTEE ON
RECENT WASHINGTON DEVELOPMENTS.

ASSIGNED TO:

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: Thomas Ratchford
D. Allan Bromley

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 02/28/91

FILE: EDUCATION*BUDGET



RECEIVED

THE UNIVERSITY OF NORTH CAROLINA

91 FEB 28 P 3: 26
CHAPEL HILL

Department of
Physics and Astronomy

OFFICE OF THE
DIRECTOR

Eugen Merzbacher
CB# 3255, Phillips Hall
Chapel Hill, N.C. 27599-3255
TEL: (919) 962-3021
FAX: (919) 962-2305
Bitnet: ulyse@unc

25 February 1991

Dr. D. Allan Bromley
Assistant to the President for Science and Technology
The White House
Washington, DC 20506

Dear Allan:

Thank you very much for your letter of 21 February. In acknowledging it, I welcome the opportunity to report to you that the President's science budget for 1992 has been received with approval and relief by the many physicists who are deeply concerned about the state of science support in our country. We are indeed pleased that the policies which you outlined to us shortly after you went to Washington are clearly reflected in the budget document. This is the crucial first step in the budget process, and we shall do all we can to let our representatives in Congress know that the recommended increases point us in the right direction.

The enclosed memorandum to the APS Physics Planning Committee briefly comments on recent Washington developments. It also refers to Leon Lederman's recent initiative. I know that you will use your much-respected powers of persuasion to insure that the core of Leon's plea - to strengthen science education and research for the good of the nation's future (and not just for the pleasure of a generation of scientists) - does not get drowned out by a chorus of critics of his exuberant and admittedly "unrealistic demands".

We look forward to seeing you at the APS Washington meeting, if not sooner.

Sincerely,

Eugen Merzbacher

cc: N. Bloembergen, E. M. Henley, R. L. Park

Enclosure

TO: APS Physics Planning Committee

FROM: Eugen Merzbacher

DATE: 25 February 1991

SUBJECT: Comments on Minutes of 14 December 1990 Meeting

We have finally found time to edit the minutes of our last meeting. If you read them, you will observe that the passage of two months has dated them in many ways. This note summarizes the events since 14 December.

The Council has approved a formal statement about the Space Station, quite close to the draft which the PPC sent back to POPA. Recently, the APS President has responded to a request from George Brown's Committee on Science, Space and Technology for written testimony with regard to the Space Station.

Entitled "Their Most Productive Years: Young Physics Faculty in 1990", the PPC report on the Survey appears on page 37 of the February 1991 issue of PHYSICS TODAY. Initial reactions to the presentation have been positive, but as expected the substance of the report has caused some dismay.

The Lederman report on "Science: The End of the Frontier?" has received much attention in Washington during the past six weeks. Leon gave several presentations at the AAAS meeting, and the report has been repeatedly referred to in the newspapers. George Brown grappled with it on at least two occasions. The AAAS is establishing a committee that will consider how best to advance the case which Leon has so made so passionately. The heart of Leon's message is that the nation needs a flourishing science enterprise as an investment in the future. It is important that this proposition not be obscured by arguments about the reliability of some of the dollar figures and percentages. Leon intends to make as much common cause as possible with the scientific societies and plans to involve the Council of Scientific Society Presidents, which APS has just rejoined after a lapse of several years.

The President's 1992 Budget contains some good news for science, as you know from What's New, AIP's FYI, and articles in SCIENCE and elsewhere. As Bob Park and Allan Bromley frequently remind us, none of this is final, and the budget that emerges from Congress next fall may be quite different. The time to make our case before Congress has arrived. Congressional Day, on Thursday 25 April, will provide an opportunity for constructive interactions with responsible people in Congress. Preparations are moving along under the direction of Tina Kaarsberg and Bob Park (plus some extra part-time help hired for the occasion).

The Council Statement on Physics Funding and the SSC and a page of explanatory text have been widely distributed by the Washington Office. In his retiring presidential address at the AAAS, Don Langenberg cited the statement approvingly as a rare example of scientists doing their "civic duty". There has of course also been some "flak", but most of our colleagues seem to feel that the Council did the right thing.

Where shall we go from here? Please be prepared for debating that question when we meet on **Friday, 26 April, at the APS Washington Office.**

"CORRESPONDENCE TRACKING"

TYPE: CONGRESSIONAL

DOCUMENT NUMBER: 9120598

FROM: HATFIELD, Mark O.: U.S. SENATE

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 02/22/91

SUBJECT: DISCUSSION ON THE CURRENT FCCSET REPORT, MATH &
SCIENCE EDUCATION AND THE POSSIBILITY OF A FULL
APPROPRIATIONS COMMITTEE HEARING.

ASSIGNED TO:

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: D. Allan Bromley, MB
Ken Yale
Damar Hawkins
Thomas Ratchford

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 03/04/91

FILE: CONGRESSIONAL*EDUCATION

MARK O. HATFIELD
OREGON

RECEIVED
United States Senate

WASHINGTON, DC

91 MAR 4 P2:40

February 22, 1991

OFFICE OF THE
DIRECTOR

Dr. D. Allan Bromley
Assistant to the President
for Science and Technology
Office of Science and Technology Policy
Old Executive Office Building
Washington, D.C. 20506

Dear Allan:

I want to thank you for visiting with me this morning to discuss the current FCCSET report, future activities in your Office, and possible strategies for improving America's mathematics and science education process.

I have had an opportunity to discuss with Senator Byrd to explore the possibility of a full Appropriations Committee hearing. Because the interagency report involves a number of subcommittees, Senator Byrd feels that a full committee hearing is plausible. He will further consider the matter. Meanwhile, my staff will be in contact with the committee staffs to explore the possibilities.

I look forward to working with you to make this hearing a reality. I congratulate you again for establishing the process of collaboration among federal agencies and pursuing a similar relationship with the Congress.

With kind regards,

Sincerely,



Mark O. Hatfield
United States Senator

MOH/jyk

logged

"CORRESPONDENCE TRACKING"

TYPE: INVITATION*ACTION

DOCUMENT NUMBER: 9120522

FROM: STROSCIO, Michael A.: DEPARTMENT OF THE ARMY

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 02/21/91

SUBJECT: -INVITATION TO GIVE THE AFTER DINNER ADDRESS.
-FOLLOW UP ON INTERDISCIPLINARY RESEARCH AT YALE.
-REQUEST TO MEET WITH DR. GERALD J. IAFRATE.

FILE
ARO
(Army Res gje)

ASSIGNED TO: Steve Olson
Thomas Ratchford

ACTION REQUIRED: AS NECESSARY

SENDER'S DUE DATE:

OSTP DUE DATE:

03/17/91

DATE COMPLETED: -----

COPIES TO: Ken Yale
Michelle Van Cleave

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 02/25/91

FILE: SPEECH*MEETING*EDUCATION

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
01a. Letter	To: Allan Bromley From: Michael A. Stroschio Re: Interdisciplinary research at Yale (2 pp.)	2/21/91	(b)(1)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: Education Files
WHORM Cat.:
File Location: Education: General (2) [3 of 3] [1991]

Date Closed:	3/9/2010	OA/ID Number:	62032-001
FOIA/SYS Case #:	2005-0336-F	Appeal Case #:	
Re-review Case #:		Appeal Disposition:	
P-2/P-5 Review Case #:		Disposition Date:	
AR Case #:		MR Case #:	
AR Disposition:		MR Disposition:	
AR Disposition Date:		MR Disposition Date:	

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

P-1 National Security Classified Information [(a)(1) of the PRA]
 P-2 Relating to the appointment to Federal office [(a)(2) of the PRA]
 P-3 Release would violate a Federal statute [(a)(3) of the PRA]
 P-4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
 P-5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
 P-6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Removed as a personal record misfile.

Freedom of Information Act - [5 U.S.C. 552(b)]

(b)(1) National security classified information [(b)(1) of the FOIA]
 (b)(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
 (b)(3) Release would violate a Federal statute [(b)(3) of the FOIA]
 (b)(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
 (b)(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
 (b)(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
 (b)(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
 (b)(9) Release would disclose geological or geophysical information

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
01b. Letter	To: Micahel Stroschio From: Benno Schmidt Re: Science and Engineering at Yale (3 pp.)	1/29/91	(b)(2)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: Education Files
WHORM Cat.:
File Location: Education: General (2) [3 of 3] [1991]

Date Closed:	3/9/2010	OA/ID Number:	62032-001
FOIA/SYS Case #:	2005-0336-F	Appeal Case #:	
Re-review Case #:		Appeal Disposition:	
P-2/P-5 Review Case #:		Disposition Date:	
AR Case #:		MR Case #:	
AR Disposition:		MR Disposition:	
AR Disposition Date:		MR Disposition Date:	

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

P-1 National Security Classified Information [(a)(1) of the PRA]
P-2 Relating to the appointment to Federal office [(a)(2) of the PRA]
P-3 Release would violate a Federal statute [(a)(3) of the PRA]
P-4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
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C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Removed as a personal record misfile.

Freedom of Information Act - [5 U.S.C. 552(b)]

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(b)(9) Release would disclose geological or geophysical information

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
01c. Letter	To: Benno Schmidt From: Micahel Stroschio Re: Science and Engineering at Yale (3 pp.)	10/18/90	(b)(2)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: Education Files
WHORM Cat.:
File Location: Education: General (2) [3 of 3] [1991]

Date Closed:	3/9/2010	OA/ID Number:	62032-001
FOIA/SYS Case #:	2005-0336-F	Appeal Case #:	
Re-review Case #:		Appeal Disposition:	
P-2/P-5 Review Case #:		Disposition Date:	
AR Case #:		MR Case #:	
AR Disposition:		MR Disposition:	
AR Disposition Date:		MR Disposition Date:	

RESTRICTION CODES

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	FEDERAL SUPPORT (A)	BUSINESS SUPPORT	OTHER SUPPORT	TOTAL SUPPORT	RESOURCES PER FACULTY MEMBER
COLUMBIA	\$14,306	\$6,108	\$1,725	\$22,139	\$183
HARVARD	\$11,800	\$266	\$1,494	\$13,561	\$271
PRINCETON	(B)	(B)	(B)	\$19,368	\$211
YALE	\$4,024	\$881	(C)	\$4,906	\$107
U. of MICHIGAN	\$31,137	\$5,143	\$7,865	\$44,146	\$144

SOURCE: American Society of Engineering Education, March 1989

(A) All amounts are for a one year period starting in Summer 1987;
all amounts are given in thousands of dollars.

(B) No separate amounts listed.

(C) No funds reported in this category.

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
01d. Chart	Army Research Office Impact on Patriot Missile (1 pp.)		(b)(1)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: Education Files
WHORM Cat.:
File Location: Education: General (2) [3 of 3] [1991]

Date Closed:	3/9/2010	OA/ID Number:	62032-001
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Re-review Case #:		Appeal Disposition:	
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AR Case #:		MR Case #:	
AR Disposition:		MR Disposition:	
AR Disposition Date:		MR Disposition Date:	

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(b)(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
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(b)(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
(b)(9) Release would disclose geological or geophysical information

U.S. ARMY RESEARCH OFFICE FORTIETH ANNIVERSARY SYMPOSIUM:
"BASIC RESEARCH - SHAPING THE FUTURE OF THE ARMY"

Friday, June 14, 1991
OMNI Durham Hotel and Conference Center
Durham, North Carolina

I. Introductory Session

9:00 am to 10:30 am

Dr. Gerald J. Iafrate,
Director, U.S. Army Research Office (ARO)
Presiding for 45 minutes

Remark by or recognition of:

- Major General Jerry C. Harrison,
Commander, U.S. Army LABCOM
- General William G.T. Tuttle, Jr.,
Commander, U.S. Army Materiel
Command
- Senior Official,
Office of the Secretary of the Army

Dr. Iafrate will give a short talk on
what ARO does. He will "turn the clock
back" and introduce:

Major General Chester W. Clark,
USA Retired
Zeroth Commander, Office of Ordnance
Research (OOR) (now ARO)
20 minutes

Prof. Marcus E. Hobbs, Distinguished
University Service Professor
Emeritus of Duke University
First OOR (ARO) Chief Scientist
20 minutes

Dr. Iafrate's summary

10:30 am to 11:00 am

BREAK

II. Session on Payoff from ARO Research

Chairman from 11:00 am to noon: Dr. Hermann Robl

11:00 am to 11:30 am	Professor Charles Townes** 1964 Nobel Prize for Maser-Laser Concept "Investing in Research"
11:30 am to 12:00 am	Professor James Glimm State University of New York "Computational Research"
12:15 am to 1:20 pm	LUNCH

III. Session on Payoff from ARO Research

Chairman from 1:40 pm to 3:30 pm: Dr. George Wyman

1:40 pm to 2:10 pm	Professor Herbert C. Brown Purdue University 1979 Nobel Prize "Payoff from Basic Research in Chemistry"
2:10 pm to 2:40 pm	Professor W.E. Wallace University of Pittsburgh "Development and Army Applications of High Energy Permanent Magnets"
2:40 pm to 3:00 pm	BREAK
3:00 pm to 3:30 pm	Professor Erland M. Schulson Dartmouth College "Army Applications of Basic Findings in Ice Mechanics"
3:30 pm to 4:15 pm	BREAK

**University and industry speakers were all supported by ARO or its parent organizations; some government speakers were also supported by ARO.

IV. Panel Discussion

4:15 pm to 5:15 pm

Panel Discussion on the Future of
Mission-Oriented Basic Research

Moderator: Professor Eugene Wong,
Associate Director of the Office
of Science and Technology
Policy for Physical Sciences
and Engineering, Executive Office of
the President, White House

Members: Dr. Leo Esaki, IBM Fellow
1973 Nobel Prize, IBM

Professor Leon Cooper
1972 Nobel Prize, Brown Univ.

Professor Norman Hackerman,
President Emeritus
Rice University

Dr. Albert R.C. Westwood
Vice President of
Martin Marietta

Dr. Charles M. Vest
President, MIT

V. Reception, Dinner and After Dinner Address

5:15 pm to 6:15 pm

RECEPTION

6:15 pm to 7:15 pm

DINNER

7:15 pm to 7:45 pm

Dr. Gerald J. Iafrate,
Recognition of Selected Participants
and General Comments

7:45 pm to 8:30 pm

After Dinner Address
(Introduced by Dr. Iafrate)
(Speaker to be determined)

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9120530

FROM: HETTINGER, William P.: ASHLAND PETROLEUM COMPANY

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 02/19/91

SUBJECT: LETTER TO THE PRESIDENT URGING HIM TO DEVELOP A
COMPREHENSIVE PLAN FOR INVESTMENT IN ACADEMIC
SCIENCE FACILITIES & TO INCLUDE IT IN THE FY92
BUDGET

ASSIGNED TO:

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: D. Allan Bromley
Thomas Ratchford

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 02/26/91

FILE: EDUCATION

912 0530



Ashland Petroleum Company

DIVISION OF ASHLAND OIL, INC.

P.O. BOX 391 • ASHLAND, KENTUCKY 40114-0391 (606) 329-3333

RECEIVED

31 FEB 26 1991

DR. WILLIAM P. HETTINGER, JR.
Vice President

February 19, 1991
OFFICE OF THE
DIRECTOR

President George Bush
The White House
1600 Pennsylvania Avenue
Washington, DC 20500

SUBJECT: Academic Science Facilities

Dear President Bush:

As the Ashland Oil Representative to the Industrial Research Institute, I wish to add my support to the program which was described in a letter by Senator Terry Sanford and 26 other members of the Congress urging you to develop a comprehensive plan for investment in academic science facilities and to include the plan in the budget for Fiscal Year 1992.

We in industry are most painfully aware of the importance of technical trained professionals to our operations and we too are concerned about the training and availability of our young people in the years ahead. The decline in the availability of academic science facilities for training our young people both in the universities and high schools is one of great concern to us.

I personally have been deeply involved in the affairs of our Kentucky Academy of Science and the Junior Academy supported by the Kentucky Academy. This year we were able to send three young high school students to the national meeting of the American Association for the Advancement of Science, the National Association for the Advancement of Science, and the American Junior Academy of Science held in Washington this month, February 13-18.

While we were proud to send three of our winning students based on their research work, we are quite aware that very few high schools in the state have the laboratory facilities which enables these young people to undertake research projects, even though facilities for sports are adequately available.

While the states also have responsibility for this effort, it requires federal leadership to spearhead the effort.

We were deeply pleased to see your interest in science manifested by your speech to the AAAS on Friday, February 15, and feel that with such an expression of interest in the science program and

with your leadership, that efforts to provide better academic science facilities can be achieved.

Sincerely,

William P. Hettinger, Jr.

W. P. Hettinger, Jr.

WPH/pb

WPH-91-33

cc: D. A. Bromley ✓
W. G. Burwell
C. F. Larson
C. B. Miller
P. Warren
H. M. Zachem

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9120506

FROM: KLEPPNER, Daniel: MASSACHUETTES INSTITUTE OF TECHNOLOGY

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 02/18/91

SUBJECT: INDIVIDUAL-INVESTIGATOR RESEARCH IN THE
UNIVERSITIES. ("THE LEDERMAN REPORT AND ITS CRITICS"
AND "SCIENCE ON THE SKIDS" ENCLOSED.)

ASSIGNED TO:

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED: -----

COPIES TO: D. Allan Bromley
Thomas Ratchford

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 02/25/91

FILE: EDUCATION

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
DEPARTMENT OF PHYSICS

Daniel Kleppner
Lester Wolfe Professor of Physics

address: MIT
room 26-237
Cambridge, MA 02139

phone: 617/253-6811
FAX: 617/253-4876

RECEIVED

91 20502
81 FEB 25 A10: 24

February 18, 1991

Dr. D. Allan Bromley
Assistant to the President for Science & Technology
The White House
1600 Pennsylvania Avenue
Washington, DC 20500

OFFICE OF THE
DIRECTOR

Dear Allan,

Just a short note to express appreciation for your efforts to increase the support for individual-investigator research in the universities. The President's speech to the AAAS last Friday addressed this issue clearly, and I was delighted by the commitment he expressed. Although a good advisor's role is never publicly conspicuous, your influence is nevertheless unmistakable. The community of scientists must often strike you as an ungrateful lot, but please believe me that many of my colleagues share my appreciation for what you are doing.

The proposed budget for the NSF sends a loud signal of encouragement to the university community. The special initiative for academic research instrumentation is a particularly welcome development. The program can be expected to have a significant stimulating effect on the research community.

Steering the NSF budget through Congress will undoubtedly be a tough job. We all wish you well in this endeavor, and many of us are anxious to help. As you know, the APS is arranging a "visiting day" on the Hill during the April meeting. The recent APS Physics Planning Committee survey on Young Faculty, which I imagine you have seen, documents some of the issues raised in the Lederman report. A slightly edited version has been published in *Physics Today* — a reprint is enclosed. I also enclose drafts of an article on the Lederman report that will be published in *Issues of Science and Technology*, and an article intended for the more general public that will appear in *The Sciences* magazine (N.Y. Academy of Sciences). I send these simply to let you know that we are behind you.

With best regards,

Dan

THE LEDERMAN REPORT AND ITS CRITICS

Daniel Kleppner

Department of Physics and Research Laboratory of Electronics
Massachusetts Institute of Technology

Leon Lederman, president-elect of the American Association for the Advancement of Science, was sufficiently worried about science in our universities to launch an A.A.A.S. study. The report, *Science: The End of the Frontier?*, appeared last January. The bottom line is that university research is in serious trouble due to the lack of support and that it deserves a healthy injection of funding. Its reception was mixed. Scientists, for the most part, were grateful to have their problems aired. However, a number of congressional staff members and at least a few federal research administrators were by no means persuaded. Some, in fact, took the opposite view, dismissing the enterprise as the special pleading of a group of elitists who have lived on the public dole too well and too long. Such a view undoubtedly reflects the realities of politics plus a natural suspicion of an anecdotal and obviously self-serving report, but it reveals an underlying complacency that jeopardizes our scientific future.

Lederman's report is unconventional. Eschewing the usual paraphernalia of panels, sub panels, consultants, and review committees, he simply sent letters to the physics, chemistry and biology department chairs of the thirty leading research universities, plus twenty other universities and colleges, and asked them to describe the general situation for the support of their research and how their careers were faring. In addition, he asked them to pass on his request to a few other members of their departments at various stages in their careers. He received two hundred and fifty replies. As Lederman points out, few people can resist an opportunity to complain. The report continues "However, the emotional intensity of the letters and the depth of their pessimism was so far above these ordinary levels that we can only conclude that they register a mood of deep depression in the research community. And this depression is widespread, independent of institution, field and rank." The report goes on to discuss general funding patterns, the size of our research enterprise, the arguments for maintaining our strength in science, and how much support is needed to set things right—Lederman's own estimate being an increment of \$10 billion over a few years.

The major arguments that have been directed against the report are:

It is merely anecdotal. The results lack credibility because the sample is biased: unhappy scientists will make the most of an opportunity to gripe while happy scientists will not bother. Although the Lederman report may not be "scientific", precisely the same picture was revealed by a recent systematic study. The American Physical Society (APS) recently completed a survey of every physics university faculty member within ten years of the Ph.D. (the 1990 Young Physics Faculty Survey). The total population numbered 939 and the response rate was 71%. Analysis of the responses yielded a picture that was almost identical to that of the Lederman report. (The level of anxiety was, if anything, higher: younger faculty have a harder time competing for funds than established scientists, and delays to their research can have immediate consequences for their careers.)

The report is obviously self-serving. The comment is correct but irrelevant. Science policy in the United States is not centralized: the responsibility is distributed throughout the Administration, Congress, and the directors of various agencies. Such a structure may have sufficed in the past, but it is not working today. If scientists remain silent about what is happening, who will speak out?

Science budgets have received such favorable treatment from Congress in recent years that the cries of "more" are simply not credible. Budget analysis is a complicated matter, and so I shall discuss only the National Science Foundation. The NSF supports essentially half of the university research in the physical sciences — math, physics, chemistry, astronomy, materials science — and is by far the largest single agency in these fields. (The remaining support is from DOE, NASA, DOD and some other agencies. NIH plays only a small role in the physical sciences.) From 1985 through 1990 the NSF budget grew at an average rate of 6.9%. This may look reasonable, considering the times, though it is far below the rate recommended by President Reagan in his 1977 request to double the NSF budget in five years: 14.8%. However, during those same years Congress gave the NSF major new responsibilities for engineering and for science education, and these not only used up the modest increases, they ate into the research base. The average annual increase in the budgets for the various physical sciences from 1985 through 1990 averaged about 2%. When inflation is taken into account, it is evident that NSF's budgets for university research in the physical sciences have gone *down*, not up. Lederman's report takes a longer view of the budget for basic and applied research in

colleges and universities, and quotes a 20% increase in constant dollars from 1968 to 1989. (The increase is sensitive to the inflation index employed: others quote a figure of 60%.) Over the same period, the number of Ph.D. scientists and engineers in the colleges and universities increased from 100,000 to 200,000. It is evident that the growth in support has fallen far behind the growth of Ph.D. scientists. This naturally leads to the next point.

The problem is not too little money but too many scientists. The scientific community can't expect to grow indefinitely. There is a debate as to whether we are training too many or too few scientists and engineers. In the former camp is Robert White, who in his talk "the Sorcerer's Apprentice", argued that we are in a runaway situation. In the latter camp is Richard Atkinson, who argues that we are heading for a severe shortage. Manpower prediction is obviously a difficult business, but the consensus seems to be that over the long run we will need more, not less. When one considers that faculty retirements are going to increase rapidly (the median age for physicists rose from 39 years in 1969 to 52 years today, and such aging obviously cannot continue indefinitely), it seems to be difficult to believe that we should cut our Ph.D. supply, particularly when the universities are already reporting difficulty in making appointments in some sub fields. Furthermore, we are going to need more scientists, not less, to deal with continuing societal problems such as energy and the environment.

Congress is unsympathetic to special interest groups that plead for more money. Before asking what the government can do for them, the university scientists would be well advised to explain what they can do for the government. Translation: come to Congress with a megaproject and you may be able to drum up enough visibility to get some political clout behind it, but ask for more money for lots of people doing lots of little things and you are not going to get much of a hearing. The problem is that most of the advances in science, particularly those advances which have technical and industrial spinoffs, come from small research groups. This style of research encompasses solid state and materials research, superconductivity, biophysics and atmospheric science, optics and lasers. Most importantly, all of our Ph.D. scientists are trained in our university research groups. If we are going to survive as a scientific leader, Congress needs the wisdom to recognize the central contribution of university research, and its critical role in education.

Science should get its own house in order. The argument is that there is plenty of support for science; scientists merely need to set their priorities, cut out the fat, and get on with their work. When it comes to establishing a large facility such as a telescope, accelerator, reactor or synchrotron light source, a community of scientists can indeed examine the various candidates and hammer out a prioritized list. For high visibility projects such as the SSC or the genome project, a vigorous group of scientists can even generate enough enthusiasm to build a political constituency. There are, however, no mechanisms for addressing the broad needs of university research. The case for giving high priority to university-based research has been put forward repeatedly, for instance in the Brinkman, Pimantel and Packard-Bromley reports, but in the absence of any effective policy-making body, it has always fallen on deaf ears. Furthermore, the educational role of university research continues to be widely misunderstood. In describing his graduate students, one professor put it this way: "My research is their education". In contrast, Congress has expressed the view that research is in conflict with education. Finally, when one notes the tiny fraction of federal R&D support that is devoted to university-based research, one cannot help but question the process by which Congress sets its own scientific priorities.

Naturally the scientists want more support. No matter how much they have, scientists will always want more. This is simply not true. One of the most interesting facts to emerge from the APS Young Physics Faculty Survey was the response to a question asking about the level of support. The identical question was asked in a similar survey in 1977. In 1977, the young scientists regarded their support as generally favorable. In 1990 they viewed the situation as extremely poor.

In these times of budgetary stringency, it is presumptuous for university scientists to ask for more support. The total cost for basic research in the universities is not large and could be accommodated within our present R&D budget. The Federal R&D expenditures are currently about \$70 billion: a shift of a few percent among these expenditures could reverse the downward trend of our universities. It is difficult to argue that our R&D investments are well thought out. The Augustine report, for example, provided convincing evidence that our plans for the space station have been misdirected. Nevertheless, almost as much has been appropriated for the space station in 1991 as for the entire National Science Foundation.

Cries of despair are not very plausible considering that the United States clearly leads the world in science. The argument generally goes something like this: "Year after year we run away with the Nobel Prizes. Foreign students flock to our graduate schools. There is virtually no area of modern science in which the United States is not a major player. Scientifically, we are the envy of the world." We do, indeed, run away with the Nobel Prizes. In physics, from 1980 through 1990, fifteen of the twenty five prizes awarded in physics went to the U.S. However, nearly all of the U.S. prizes were for work done fifteen or twenty years earlier. Of the twenty five prizes, eight were awarded for discoveries the very same year or within a few years. Out of these eight, only one went to the U.S. Scientifically, we are coasting on our reputation. It is true that foreign graduate students flock to our graduate schools. But the reason that we accept them is that the number of U.S. students is dwindling. Roughly half our Ph.D. students are foreign and the fraction is creeping up. Scientifically, we are running a brain-deficit. It is hardly reassuring that fewer and fewer U.S. students are choosing careers as professional scientists. The climate described in Lederman's report will do nothing to reverse this trend. And as for being the scientific envy of the world, that was true once, but it is true no longer. Both the Lederman and the APS surveys report instances of U.S. scientists who had to stand aside as their ideas were carried forward in foreign laboratories which have up to date facilities and adequate support. The issue is not scientific leadership but scientific competitiveness. We are losing it.

The central issue addressed in the Lederman report is the scientific quality of life in our universities, and it is dropping rapidly. To dismiss the report as the self-serving pleas of a special interest group is to fail to recognize the central role of our universities and how much we stand to lose if the current trend continues. A number of respondents to the Lederman and APS surveys stated that they no longer advise their students to pursue academic careers. Such statements are new. If our professors cannot in good conscience recommend academic careers to their best students, we are finished scientifically.

Twenty years ago we led the world in high technology and manufacturing. Within fifteen years we lost leadership in industry and after industry: textiles, machine tools, automobile manufacturing, steel, consumer electronics ... the list goes on. With the wisdom of hindsight it is clear that we did not need to lose all of these industries. The reasons are complicated, but if there is one underlying factor, it was complacency. If we had known what was happening, surely we would not have stood aside and let it happen. Today, all the evidence points to the loss of our world class position in university-based

science. We do not need to let it happen and we cannot effort to be complacent.

SCIENCE ON THE SKIDS

Once again the United States has made a clean sweep of the Nobel Prizes in science. The steady stream of Nobel Prizes and other international awards reassures us that no matter what misgivings we may have about how the country is doing, in science, at least, we are doing very well. Our graduate schools, widely regarded as the best in the world, are besieged with applications from abroad; our journals are the journals of choice in many fields. There is virtually no area of science in which the United States is not a major player. Unfortunately, we are about to take a nose dive in science. We do not need to.

A close look at the Nobel record reveals a less reassuring picture. It is true that from 1980 through 1990, the United States won more Nobel Prizes in physics than all the other nations of the world together- fifteen out of twenty five- but if one looks at *when* the prize was awarded, the picture is less glorious. Some discoveries, for instance high temperature superconductivity, are so breathtaking that they receive the Nobel Prize within a few years or even the very same year. More often, the prize comes years later. Of the twenty five prizes from 1980 through 1990, eight went for work so "hot" that the award was prompt: Of these eight prizes, seven went to Europe. Every other U.S. prize was for work twenty or more years earlier. Scientifically, we are coasting.

Nobel Prize counting is a small numbers game and a small numbers game is not a reliable way to judge a nation's scientific vitality. Nevertheless, the recent history suggests that although the United States dominated the scientific world twenty years ago, it does not do so today. Today Europe is not only competitive, it is starting to run away with the honors.

Scientific leadership by Europe is hardly a novel situation for Europe dominated science until World War II. By the end of the war, however, most European scientific institutions were wrecked and many of the best scientists had fled to the United States. Rebuilding science demands a sustained commitment for years and years: Europe needed roughly thirty years. By the early 1980s, Europe was becoming competitive. Today, in many areas European research is fully competitive with our own.

Scientific knowledge takes no notice of national boundaries, particularly these days when the latest discoveries race around the world by electronic mail. What Europe

learns, we learn, and vice versa. Science is mankind's most successful international institution: that European science is flourishing should be cause for celebration, not anxiety. There is no reason for the United States to dominate the world of science. Nevertheless, unless we intend to abandon science we must be able to compete in the important areas. Remaining competitive requires that our scientists have reasonable resources for pursuing new ideas. They cannot be expected to lead productive careers while being continuously harassed by funding problems, nor can they be expected to stand by while their ideas are brought to fruition abroad.

Most of the basic research in the United States is carried out in our research universities. In other countries scientific research is often segregated in specialized research institutes but we have discovered that plunging graduate students into front line research early in their careers is a superb method of producing top notch scientists. The vitality, enthusiasm and fresh viewpoints that our students bring to research has been a major factor in the development of our universities as world class research institutions. Furthermore, because professors are teachers as well as scientists, our university scientists are continually forced to renew their ideas. To cite the Nobel Prize list once again: all of the U.S. prizes went to professors for work done with students at their universities or at accelerator facilities. Our universities carry out much of our basic research and train essentially all of our scientists: our scientific future depends critically on their health.

The 1960s were a decade of wild growth for American research universities. Spurred by Eisenhower's alarm over sputnik, the federal government launched massive programs for science and science education. In 1960, U.S. universities produced 550 Ph.D. physicists. In 1970 the number of Ph.D.s had tripled, to 1650 (I quote statistics for physics because that is my own field and I know its story best. The general story is the same in all of the physical sciences, math, physics, chemistry, astronomy and materials science.) During the same decade, the size of our physics faculties grew by a factor of two. Such growth was bound to slow down, but instead of tapering off, it abruptly collapsed as the federal government yanked support from science under the pressure of the Vietnam war. During the 1970s, Ph.D. production plunged to about 900 per year, and faculty hiring dwindled to a trickle. In 1970 the median age of our physics faculties was 39 years: today it is 52 years. Most of today's faculty members were hired in the '60s, and they are getting ready to retire. During the next one or two decades we will need to replace most of the scientists on our university faculties. Some departments expect a

100% turnover within fifteen years. In the past this would have been no problem, for university positions were coveted and excellent candidates lined up for the few available positions. Today, university research careers are no longer attractive to many young scientists and departments are having trouble filling positions.

The underlying problem with university research careers is that professors are being forced to carry out research on a shoestring. They are spending more and more time writing proposals, searching for research support from agencies that have less and less to provide. These problems were highlighted as long ago as 1985 in three separate studies: a survey of chemistry carried out by the National Research Council (the "Pimantel report"), a survey of physics also carried out by the National Research Council (the "Brinkman report"), and a study of science in the universities carried out by the White House Council on Science (the "Packard-Bromley report"). The reports all reached a similar conclusion. The ultimate strength of science in the U.S. lies in the thousands of small research groups in the universities across the country, and these groups are seriously underfunded. The National Science Foundation provides the major support for university research in the physical sciences, and although President Reagan announced that the NSF budget would be doubled, Congress thought otherwise. From 1985 through 1990, NSF's budget grew at an average rate of 6.9% per year, not taking inflation into account. At the same time, Congress directed NSF to put more resources into pre-college science education, and NSF decided to put its remaining new resources into engineering and technology. As a result, for the past five years the budgets for basic science research have grown at a rate of about two percent per year, before inflation. The university groups are substantially worse off now than they were five years ago, and five years ago the situation was poor.

Today, in certain areas, young scientists are finding it practically impossible to obtain research grants. A recent survey of young physics faculty by the American Physical Society revealed that to obtain their first grant the young physicists submitted an average of four proposals, of which, on the average, 1.4 were funded. However, most of the funded proposals received no more than half of the required budget. These were the lucky ones. 37% of the young scientists had failed to obtain any support after submitting three proposals. The situation is well summarized by one young physicist who wrote "The research is incredibly exciting. The funding situation is dismal". The situation for senior scientists is hardly any better. Leading scientists, even Nobel Prize winners, have had their budgets cut. A recent study by the American Association for the Advancement

of Science solicited opinions from university scientists across the nation, and the response was overwhelming. The climate for research is dismal. Some professors said that they could no longer recommend academic careers to their students. If we cannot in good conscience recommend academic careers to our best students, we are finished scientifically.

Why has science been allowed to slip into this precarious position? The usual reason cited is pressure from the budget deficit. The federal government, however, is currently lavishing about \$65 billion on research and development (R&D), and industry is spending about the same amount. In contrast, the total NSF budget in 1990, was only \$2.1 billion, of which the amount spent on math, physics, chemistry, astronomy and materials science was \$610 million. A small shift of our R&D funds would have enormous leverage on our scientific future: it could reverse the downward slope. Most of our R&D expenditures are on defense. The long history of aborted or failed high technology systems cannot fail to raise doubts about whether we are investing these R&D funds sensibly. Unfortunately, it is not easy to shift DoD funds to civilian purposes. NASA, on the other hand, competes directly with the National Science Foundation in the same budget function. We have spent \$4 billion on NASA's proposed space station without any convincing justification, and we will spend \$1.9 billion more this year, almost as much as the total NSF budget. The recent Augustine report, chaired by the head of Martin Marietta Corporation, eloquently confirms what most scientists know - the space station has no serious scientific purpose aside from keeping man alive in space and is no more likely to succeed technically than our space shuttle program. It seems incredible that we can spend billions on such flawed projects while allowing the world's greatest scientific institutions to decline for the lack of relatively modest funds.

Is it essential for the United States to maintain its position at the frontiers of science? The question is hardly trivial, for in our faltering and deficit-ridden economy it is by no means obvious that science isn't a luxury that we could forgo. The conventional economic argument for science is that the discoveries of science lead to new technologies, and from new technologies come new industries. The Japanese, however, constructed a world-class economy based on advanced industries and high technology while making essentially no systematic effort at basic research. Japan took the fruits of research from abroad and applied them to products and technologies that quickly dominated the world's markets. Why not do the same?

Losing our competence in science would be a national disaster for many reasons. First, it should be noted that although Japan placed little emphasis on basic research in the past, it is moving forward rapidly today. The ideas of basic research may spread rapidly, but the country that makes the new discovery has an advantage: it has a head start up the "learning tree" that must be climbed before a new concept becomes a new industry. A small lead at the beginning can grow rapidly. Second, Japan is unwilling to continue to rely on foreigners for creative ideas: fundamental research is an unmatched classroom for the creative imagination. One might also speculate that Japan is worried that in the years to come the United States may not be capable of providing the new ideas that are needed to create new technologies.

Nevertheless, in this period of belt tightening and cutbacks of one public service after another, one might still question whether science isn't dispensable. There is no precise way to calculate what we get back from our annual investment in science because basic research requires a sustained effort over many years and its applications, if any, may take many more years yet. Attempts to quantify the returns from science ultimately fail because the rare discoveries that are truly revolutionary transcend all the complexities of economics. For example, although it is not yet widely appreciated, we live in a golden age of astrophysics and cosmology. The path to a new understanding of the universe lies before us. What value could we attach to a new view of the creation of the universe? One might just as well ask what was the value to mankind of the Copernican revolution. Similarly, there is no way to foresee the impact of the biologists' quest to understand the origins of life, nor the neuroscientists' quest to understand the functioning of the brain.

For some areas one can attempt to calculate the return on investment in basic science: the typical result is ten to one. Dollar figures, however, can be deceiving. Consider, for example, the laser. The laser was an unexpected byproduct of basic research on molecular structure. Its invention propelled a revolution in modern optics. Out of that revolution grew optical communications, a multi billion dollar industry whose impact on society is just beginning to be felt. Lasers are now ubiquitous in manufacturing and they can be found in every CD player, laser printer, and automated supermarket checkout. The laser has also become an important medical tool for diagnostics and for therapies. A type of cervical cancer that previously required a hysterectomy can now be cured in a doctor's office with a simple, painless procedure. How can one assign a dollar value to such a cure?

Fundamentally, the United States supports basic research because it requires the discoveries and insights of science to deal with crucial national needs such as health, energy, the environment, and the challenge of assisting the third world countries in their attempts to raise their standard of living. We need to develop new technologies to generate new industries and to help our old industries to become more efficient. Most of all, we must continue to produce young scientists with the intelligence, imagination and energy to overcome the problem of living in an increasingly complicated world, and to provide the breathtaking discoveries that elevate the human spirit and help to make a nation great.

If we had realized twenty years ago that the United States was about to lose its leadership in manufacturing and high technology, surely we would not have stood by quietly. We would not have permitted the steel industry to slip through our fingers, nor the automobile industry, nor the machine tool and semiconductor chip industries, nor television and all the rest of home electronics. Today, we have every reason to believe that we are about to lose our leadership in science. Have we learned anything from the past decades or are we going to stand by complacently as we lose one of the few areas in which we are still excellent?

Daniel Kleppner

Lester Wolfe Professor of Physics and

Associate Director, Research Laboratory of Electronics

MIT

room 26-237

Cambridge, MA 02139

phone: 617/253-6811

FAX: 617/253-4876

Logged

"CORRESPONDENCE TRACKING"

TYPE: ACTION

DOCUMENT NUMBER: 9120457

FROM: BUSH, GREGORY G.

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 02/14/91

SUBJECT: REQUEST TO SAVE THE WOODROW WILSON CHEMISTRY
INSTITUTE AT PRINCETON WHICH THE NATIONAL SCIENCE
FOUNDATION HAS REFUSED TO FUND FOR 1991.

ASSIGNED TO: Thomas Ratchford CD

ACTION REQUIRED: AS NECESSARY

SENDER'S DUE DATE: 3/10/91

OSTP DUE DATE: 03/12/91

DATE COMPLETED: -----

COPIES TO: D. Allan Bromley

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 02/19/91

FILE: EDUCATION-CHEMISTRY

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OSTP DUE DATE:

03/12/91

DATE COMPLETED:

COPIES TO: D. Allan Bromley

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 02/19/91

FILE: EDUCATION-CHEMISTRY

*He should find out Jim
NSF about this and drafted to
a reply note drafted to
Mr. Bush in PA
whom I did
talk to
PAESMT*

THE WHITE HOUSE

WASHINGTON

March 28, 1991

Dear Mr. Bush:

Thank you for your recent letter bringing to my attention your views regarding the National Science Foundation (NSF) funding for the 1991 month long chemistry institute at Princeton.

I understand that NSF staff made a decision in favor of funding a biology institute at Princeton during the summer of 1991. As you know, the selection process to provide resources for a limited number of programs is often quite difficult. Although you may not agree with this decision as it pertains to an area of science that interests you, your colleagues teaching the biological sciences are certain to benefit from this summer's institute. Since this is an annual proposal process, there is nothing to preclude the submission of future proposals related to the study of chemistry. If you wish to learn more about how program decisions are made, you may contact Dr. Alan Goodman, the Program Officer for the Woodrow Wilson proposal, at 202/357-7431.

I do recall the PAESMT gathering last October and am pleased to have had the opportunity to talk with you and some of the other awardees. I am grateful to individuals like you for your tremendous efforts in science education.

Sincerely,

A handwritten signature in dark ink, reading "D. Allan Bromley". The signature is fluid and cursive, with the first name "D." and last name "Bromley" clearly legible.

D. Allan Bromley
Assistant to the President
for
Science and Technology

Mr. Gregory G. Bush
Antilles High School
Ft. Buchanan, PR 00934

9120457
RECEIVED

91 FEB 19 AM : 27

Antilles High School
Ft. Buchanan, P.R. 00934
14 February 1991

OFFICE OF THE
DIRECTOR

Dr. D. Allan Bromley
Assistant to the President for Science and
Technology.
Office of Science and Technology Policy
Old Executive Office Building
17th & Pennsylvania Avenue. N.W.
Washington, DC 20506

Dear Dr. Bromley,

We met this past October during the PAESMT affair where I was one of the fortunate awardees. From your remarks I could tell you were vitally interested in science education so I ask your help in trying to solve a problem.

I was recently informed by Nancy Arnold at the Woodrow Wilson National Fellowship Foundation that the National Science Foundation has refused to fund the 1991 month long chemistry institute at Princeton. This news stunned me. I attended the 1990 chemistry institute at Princeton and can report there could be no finer experience for a high school chemistry teacher. Yes, it was a better experience than PAESMT! It was nice getting stroked for a week but it cannot compete with the rewards and enrichment attained at the Woodrow Wilson Chemistry Institute at Princeton. THIS PROGRAM MUST BE SAVED.

If the most worthwhile program goes unfunded then NSF cannot fund any other teacher education programs. Maybe they have decided not to fund any of them or maybe this is a political decision. Yes, I am getting excited, no, worse. I see the best science education program for teachers under assault so I'm outraged. If I lived in the States I would have my senators and representatives go head-hunting for some NSF geeks.

So my appeal for help goes to you. Can you intercede? It would be appreciated by every chemistry teacher who ever attended a Woodrow Wilson summer institute and those who hopefully will. If not, could you give me a name or two that I could contact.

Thank you very much.

Sincerely,

Gregory G. Bush
Gregory G. Bush

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9120425

FROM: CASHEN, DIANA AND JANE H. INCE

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 02/13/91

SUBJECT: THE PROGRAM SERIES "THE NEW EXPLORERS"

ASSIGNED TO:

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: D. Allan Bromley

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 02/15/91

FILE: SCIENCE EDUCATION

AMERICA'S
PUBLIC
TELEVISION
STATIONS

9120425

RECEIVED

91 FEB 15 AM : 51

OFFICE OF THE
DIRECTOR

February 13, 1991

The Honorable D. Allan Bromley
Assistant to the President
for Science and Technology
Old Executive Office Building
17th and Pennsylvania Avenue, NW Suite 358
Washington D.C. 20506

Dear Dr. Bromley:

We were honored that you could join us on Monday to lend your support to public television's new innovative tool for science education, the program series "The New Explorers" with Bill Kurtis.

While we did not have a chance to speak directly with you, we wanted to let you know of our enthusiasm and new advocacy role for public television. The partnership between the public and private sectors for science education is an exciting and dynamic venture.

We look forward to working with you and your fine staff in this ongoing effort.

Sincerely,

Diana K. Cashen *Jane H. Ince*

Diana K. Cashen

Jane H. Ince

1947

100-225

[9120402]
Campbell.

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9120356

FROM: FYFE, W.S. (THE UNIVERSITY OF ONTARIO)

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 02/07/91

SUBJECT: UNIVERSAL EDUCATION

ASSIGNED TO:

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: D. Allan Bromley
Thomas Ratchford

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 02/07/91

FILE: EDUCATION

9120352

RECEIVED



91 FEB 11 PM 12:31

The UNIVERSITY of WESTERN ONTARIO

Department of Geology • Faculty of Science

OFFICE OF THE
DIRECTOR

February 7, 1991

Dr. D. Allan Bromley
Assistant to the President for
Science and Technology and
Director
Office of Science and Technology Policy
Executive Office of the President
The White House
Washington USA

Dear Allan:

I was thrilled by our discussion! It was strange to see a very good physicist and a geologist of dubious merit agree - population!

It has taken a long time to learn but I think that only universal education can save this planet and save our way of life in N. America, the Australia's etc., and improve the life of others less fortunate.

What a theme for Globe 92. TOWARDS UNIVERSAL EDUCATION FOR ALL CHILDREN, MALE FEMALE, AND TOWARDS RESPECT FOR EARTH.

We must have:

Literacy
Numeracy
Sciency

and all are equally essential to prepare for the surprises of the next century. There is no question that all the above ~~could~~ be developed by using our planet and solar system - home.

I always think that the Bruntland Report screwed up. There No. 1 conclusion "all people have the right to a clean environment etc." is total nonsense. But children should have the right to education. From my ~~reading~~ it is clear - you control population by equal rights and opportunities for females and this is only possible by equal, quality, education. Given that, one goes around all the walls of prejudice and superstition.

Dr. D.A. Bromley
Page 2
February 7, 1991

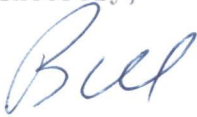
I think too, that educated people who understand a little of the life support system will accept social responsibility (even taxes!) to maintain a decent environment. From my observations and work in developing countries, I think that much of our Aid has done more harm than good. If we put the focus for the next decade on elementary schools we just might achieve something. Given pens, pencils, paper and books (knowledge), kids can even rise above their teachers and parents. Imagination drives us all. The cost is possible. For example, for a school in N.E. Brazil, \$10 per child p.a. would do miracles. For Canada which spends about 2 billion on Aid, 50% could dramatically help 100 million kids our best books magazines etc. And for our economists, most would be spent in our own industries.

We have at least 3 billion people (half under 20) living at a standard of living and opportunity below that of a London, Ontario ground hog. We can't survive that.

Allan, I enclose a few bits and pieces.

With all best wishes and appreciation for giving some time from your frantic schedule.

Yours sincerely,



W.S. Fyfe
Professor of Geology

sg

P.S. So glad to see you still use thick pens!

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9120303

FROM: ROSENZWEIG, ROBERT M.

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 01/24/91

SUBJECT: INSTITUTIONAL POLICIES GOVERNING DOCTORAL EDUCATION

ASSIGNED TO:

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: Thomas Ratchford
D. Allan Bromley

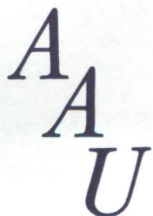
WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS: Enclosure to Dr. Ratchford.

DATE RECEIVED: 01/25/91

FILE: EDUCATION



Association of American Universities

President

January 24, 1991

Dr. D. Allan Bromley
Assistant to the President for Science and Technology
358 Old Executive Office Building
17th Street and Pennsylvania Avenue, NW
Washington, DC 20506

Dear Allan:

Enclosed for your review is a report which we have prepared on institutional policies governing doctoral education. The report contains a comprehensive set of recommendations for improving the effectiveness and efficiency of doctoral programs through increased retention rates, reduced time-to-degree, and other program improvements.

The report is the result of a major examination of institutional policies and procedures conducted over the past year by the graduate deans of AAU universities through their organization, the Association of Graduate Schools. The project was undertaken by the AGS at the request of the AAU presidents and chancellors. Their request stems in part from a growing concern over the declining proportion of U.S. students earning Ph.D.s and the difficulties this trend poses for averting widely projected shortages of Ph.D.s to fill academic, industrial, and government positions beginning later in this decade. However, both the presidents and chancellors and the graduate deans recognized that doctoral programs needed to be reevaluated and improved in any event.

Last January we prepared a report on the projected Ph.D. shortages and the role of federal funding in helping to reduce them. In the preface to *The Ph.D. Shortage: The Federal Role*, we indicated that, as important as federal funding was, the universities themselves had to take the lead in addressing the Ph.D. shortage by examining their own policies to find ways to improve the operation of their doctoral programs.

This report is the result of that effort. The AAU and AGS will monitor and share information about activities taken by member universities to implement the report's recommendations and will continue to seek ways to improve doctoral programs.

We believe that universities, the federal government, and other patrons of doctoral education need to act promptly to strengthen the capacity of our doctoral education enterprise to assist in meeting the challenges confronting the nation. We hope you share that view.

Sincerely,

Robert M. Rosenzweig

RMR/JCV/kem
Enclosure

"CORRESPONDENCE TRACKING"

TYPE: ACTION

DOCUMENT NUMBER: 9120231

FROM: GREYBER, HOWARD

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 01/22/91

SUBJECT: REQUEST MEETING TO DISCUSS EDUCATION POLICY

ASSIGNED TO: D. Allan Bromley

*Daman:
This guy wants a job in something
he bugs me at every talk in the
area. Please with a nice
note of acknowledgment
but put them off.
JAB*

ACTION REQUIRED: AS NECESSARY

SENDER'S DUE DATE:

OSTP DUE DATE:

02/19/91

DATE COMPLETED:

COPIES TO: Thomas Ratchford

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 01/28/91

FILE: EDUCATION

7120231

Jan. 22, 1991

The Hon. Dr. D. Allan Bromley, Science Adviser to the President
 The White House
 Washington, D.C. 20500

RECEIVED

Dear Allan:

sent 2/5/91

91 JAN 28 P12:48

It was a pleasure to chat with you last week when you gave your superb talk at the American Astronomical Society meeting (please send me a copy) in Philadelphia. May I have an appointment with you at your convenience to discuss education policy?

DIRECTOR

After my comment at the end of your talk, in which I urged the expansion of careful, frequently reviewed, tracking of students and of skipping of students to higher grades (professional 'educators' oppose both) seven or eight astronomers came up to me to state they agreed. They also supported wholeheartedly my suggestion for 535 High Schools of Science & Technology (like my own Stuyvesant H.S. in New York City), one for each electoral vote. No. Carolina School and the new Thomas Jefferson High School in Fairfax, VA. are other models, as is the Bronx High School of Science.

To pay for this, let me propose that Pres. Bush ask for a special War Tax on gasoline of 7 cents/gal. starting April 1st, and another raise of 7 cents/gal. on each April 1st for 3 years. This 28¢ raise would still leave our gasoline taxed less than for Canada, and far less than European countries. Trucks, tires and heating oil would have taxes raised proportionately. The President could combine this, perhaps, with a carefully scaled reduction on capital gains taxes, so that gains held for 9 months to 5 years would be taxed at 22%, and gains held longer than 5 years would be taxed at only 16%. Any surplus from the War Tax would automatically go into the Highway Trust Fund to fund the badly needed repairs of bridges, tunnels and highways around the country.

The states would pay 20% of the cost of the new schools (with perhaps the 10 states with lowest income per capita paying only 10%). The federal government would pay 50% of the operating cost of the new schools for the first 2 years, and then scaled down 10% every 2 years.

I am concerned about possible Iraqi nuclear weapon potential, and enclose for your information, a letter of mine to Gen. Scowcroft. Perhaps you can ensure that all necessary action is being taken. JAEIC stands for joint atomic energy intelligence committee. When at naval intelligence I was on their nuclear weapons working group, as the Navy Rep.

I hope to see you soon at your convenience. With best wishes,

Sincerely,



Howard Greyber

10123 Falls Road
 Potomac, MD 20854-4107

tel. 301-299-8168

The State University
in Northern Virginia

4400 University Drive
Fairfax, Virginia 22030

(703) 323-2000

Please show this to him ASAP.

WJ

~~George Mason University~~

Jan. 1, 1991

The Hon. Brent Scowcroft, National Security Adviser to the President
The White House
Washington, D.C. 20500

Dear Gen. Scowcroft,

First an Endorsement: Let me agree totally, as one who worked on the design of nuclear weapons, with Pres. Bush on opposing a total ban on the testing of nuclear weapons. Reliability concerns are sufficient reason - plenty of reports attest to this. But in addition, the fact that Soviet internal design may be very different from ours, and much easier to extrapolate from small tests to megaton weapons, may give them an advantage. Our design changed significantly from 1954 to 1984. - Alas, that nuclear expert, Mary McGrory, disagrees with the President in today's Washington Post. Unfortunately the Arms Control Assn. also disagrees.

Iraq: Just before Christmas I chatted with Col. Michael Hayden in his office in the old EOB. My talking points are enclosed.

Saddam's cockiness concerns me. Is he holding a primitive nuclear card? Remember the Tet Offensive in Vietnam? It was an unqualified military defeat for the NVA. BUT it was a political success!

Even a primitive Iraqi nuclear explosion, killing only a few hundred Allied troops, could shatter the political consensus in the world and American popular support for further war, with politicians in hue and cry!

Let me urge an immediate enlarged meeting of JAEIC together with covert and photo and NSA people to study and answer my concerns and formulate actions to take in the time remaining.

For instance, a Saudi pilot defected in an F-15 to Karhtoum. Are Chinese nuclear weapons with the CSS-2 missiles in Saudi Arabia? Could a pilot similarly defect with one or more to Iraq? A tested Chinese design weapon could wreak far more destruction than a primitive Iraqi new design.

The odds may be > 95% that Iraq has no nuclear weapons. But the serious consequences if they do means that, despite the traditional sluggish bureaucracy in intelligence, extra effort should be made, especially now.

Best wishes.

Sincerely,



Howard Greyber

10123 Falls Road
Patomac MD 20854

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
02a. Resume	Resume of Howard Greyber [personal information redacted] (1 pp.)		(b)(6)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: Education Files
WHORM Cat.:
File Location: Education: General (2) [3 of 3] [1991]

Date Closed:	3/9/2010	OA/ID Number:	62032-001
FOIA/SYS Case #:	2005-0336-F	Appeal Case #:	
Re-review Case #:		Appeal Disposition:	
P-2/P-5 Review Case #:		Disposition Date:	
AR Case #:		MR Case #:	
AR Disposition:		MR Disposition:	
AR Disposition Date:		MR Disposition Date:	

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

P-1 National Security Classified Information [(a)(1) of the PRA]
P-2 Relating to the appointment to Federal office [(a)(2) of the PRA]
P-3 Release would violate a Federal statute [(a)(3) of the PRA]
P-4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
P-5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
P-6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Removed as a personal record misfile.

Freedom of Information Act - [5 U.S.C. 552(b)]

(b)(1) National security classified information [(b)(1) of the FOIA]
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(b)(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
(b)(9) Release would disclose geological or geophysical information

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

February 7, 1991

Dear Dr. Greyber:

Thank you very much for your recent letter and for your kind comments on my talk before the American Astronomical Society. I understand a copy has been sent to you under separate cover.

I also appreciate your taking the time to share your views. It is helpful to me to hear what people are thinking about these important issues.

Sincerely,

A handwritten signature in dark ink, appearing to read "D. Allan Bromley", written in a cursive style.

D. Allan Bromley
Director

Dr. Howard Greyber
10123 Falls Road
Potomac, MD 20854-4107

"CORRESPONDENCE TRACKING"

TYPE: ACTION

DOCUMENT NUMBER: 9120231

FROM: GREYBER, HOWARD

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 01/22/91

SUBJECT: REQUEST MEETING TO DISCUSS EDUCATION POLICY

ASSIGNED TO: D. Allan Bromley

ACTION REQUIRED: AS NECESSARY

SENDER'S DUE DATE: OSTP DUE DATE: 02/19/91

DATE COMPLETED: -----

COPIES TO: Thomas Ratchford

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 01/28/91

FILE: EDUCATION

9120231

Jan. 22, 1991

The Hon. Dr. D. Allan Bromley, Science Adviser to the President
The White House
Washington, D.C. 20500

RECEIVED

Dear Allan:

91 JAN 28 P12:48

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OFFICE OF THE
DIRECTOR

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Howard Greyber

10123 Falls Road
Potomac, MD 20854-4107

tel. 301-299-8168

The State University
in Northern Virginia

4400 University Drive,
Fairfax, Virginia 22030

(703) 323-2000

Please show this to him ASAP.

4/91

~~George Mason University~~

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The White House
Washington, D.C. 20500

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Best wishes.

Sincerely,



Howard Greyber

10123 Falls Road
Patomac MD 20854

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
02b. Resume	Resume of Howard Greyber [personal information redacted] (1 pp.)		(b)(6)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: Education Files
WHORM Cat.:
File Location: Education: General (2) [3 of 3] [1991]

Date Closed:	3/9/2010	OA/ID Number:	62032-001
FOIA/SYS Case #:	2005-0336-F	Appeal Case #:	
Re-review Case #:		Appeal Disposition:	
P-2/P-5 Review Case #:		Disposition Date:	
AR Case #:		MR Case #:	
AR Disposition:		MR Disposition:	
AR Disposition Date:		MR Disposition Date:	

RESTRICTION CODES

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P-2 Relating to the appointment to Federal office [(a)(2) of the PRA]
P-3 Release would violate a Federal statute [(a)(3) of the PRA]
P-4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
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C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Removed as a personal record misfile.

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(b)(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
(b)(9) Release would disclose geological or geophysical information

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9120305

FROM: BISHOP, CHARLES J. (CORPORATE TECHNOLOGY)

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 01/12/91

SUBJECT: REQUESTING THAT A LEADERSHIP ROLE IS TAKEN IN
ESTABLISHING A NATIONAL POLICY TO DEAL WITH ACADEMIC
RESEARCH AND TEACHING FACILITIES

ASSIGNED TO:

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: D. Allan Bromley
Thomas Ratchford

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 01/30/91

FILE: EDUCATION



CORPORATE TECHNOLOGY CENTER

P.O. BOX 23990, MILWAUKEE, WI 53223-0990 414-359-4200

December 12, 1990

RECEIVED

91 JAN 30 AIO : 58

OFFICE OF THE
DIRECTOR

The Honorable George Bush
The White House
1600 Pennsylvania Ave. NW
Washington, DC 20500

Dear Mr. President:

On August 7, 1990 you received a letter from 27 members of Congress urging you to take a leadership role in establishing a national policy to deal with the obvious deterioration of academic research and teaching facilities in the United States. As an industrialist and a member of the Industrial Research Institute (IRI) Board of Directors I wish to add my support to that request.

Indeed, our scientific and engineering research and teaching facilities are in great need of modernization. I am on an Industrial Advisory Council for the Engineering School at our state university. A recent meeting addressed their concern with the outdated nature of both their research equipment and, more importantly in my mind, their teaching equipment. I saw teaching aids in civil and electrical engineering departments that date back to pre-World War II. How can we compete technologically with the rest of the world when our students are not exposed to the technologies they will need when they enter the industrial work place?

I would imagine the situation is even worse at primary and secondary schools. How can we, as a nation, expect to reverse the downward trend of students interested in scientific and engineering careers without the proper equipment and facilities to stimulate and excite them?

Something must be done, and as leader of this country you can encourage action to be taken. Congress is obviously interested in cooperating, as evidenced by their letter to you. Please address the restoration of our academic infrastructure in your 1992 budget planning process.

Very truly yours,

A handwritten signature in cursive script that reads 'Charles J. Bishop'.

Charles J. Bishop, PhD
Vice President, Corporate Technology

cc: Honorable D. Allan Bromley
Patricia Warren, Higher Education Colloquium

*Expect
something
special*

Mary,

2/13

This material belongs (as
an attachment) to the Joel Spira/
Sen. Heinz correspondence.
If I recall correctly,
Gov. Sununu asked DAB to meet
Spira.

Thanks,

Marian

9120077

Document Originally
Attached to
Following Page

"CORRESPONDENCE TRACKING"

TYPE: ACTION

DOCUMENT NUMBER: 9120077

FROM: SPIRA, JOEL

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 01/10/91

SUBJECT: METHODS IMPROVING AMERICAN COMPETITIVENESS THROUGH
USE OF EXISTING GOVERNMENT FUNDS, ESPECIALLY IN THE
AREA OF EDUCATION

ASSIGNED TO: D. Allan Bromley

ACTION REQUIRED: AS NECESSARY

SENDER'S DUE DATE: OSTP DUE DATE: 01/28/91

DATE COMPLETED: -----

COPIES TO: Thomas Ratchford
Dr. Phillips

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 01/14/91

FILE: EDUCATION

LUTRON

ELECTRONICS CO., INC.

JOEL S. SPIRA, Chairman

January 10, 1991

Dr. D. Allan Bromley
Presidential Science Advisor
Room 358
Old Executive Office Building
17th & Pennsylvania Avenues, N.W.
Washington, D.C. 20506

Dear Doctor Bromley:

I am writing you pursuant to the advice of Senator John Heinz to request a meeting with you and the Senator.

This meeting would discuss methods of significantly improving American competitiveness through more focussed use of existing Government Funds, especially in the area of education. I am attaching a summary of our proposed discussion.

I have discussed these matters with a number of senior academic and industrial people. Both the industrial people and the academics from strong scientific and technical universities are very favorable towards the benefits of such programs.

I also have spoken to Senator Arlen Specter and Congressman Don Ritter, who are quite supportive of more emphasis on Commercial Product Development from federal research funds and towards enhanced apprenticeship and technician programs.

I am knowledgeable on these problems since I have travelled to Asia and Europe extensively in connection with the business of my company. I have visited Asian and European industrial research laboratories and manufacturing facilities, also universities. I have served for a number of years, and currently serve, on visiting committees at Cornell, MIT, and Purdue on engineering matters.

I greatly appreciate your interest and look forward to seeing you.

Joel Spira

OFFICE OF THE
DIRECTOR

91 JAN 14 AM 11:42

RECEIVED

91 200077

Executive Summary for Senator John Heinz and Dr. D. Allan Bromley

We must continue to improve American competitiveness, both Domestic and International. The nation will enjoy significant economic improvement if we do two things.

- I. Encourage Commercial Product Development. (CPD)
- II. Encourage apprenticeship/technician status and respectability.

I. To encourage Commercial Product Development, the U.S. Government can:

- A. Show interest in Commercial Product Development - Public Relations.
Prizes and Recognition

- B. Take some of our present federal funding in science and technology research and direct it more toward educational programs designed to support Commercial Product Development. The funding for Commercial Product Development would primarily be aimed towards the university level in the Engineering and Science departments.

It would encourage courses, graduate theses and Professors in both the Technical and Business aspect of commercial product development.

Getting Professors interested in CPD will have a tremendous effect on students as they enter industry. Academic approval of something other than research would make CPD an "OK thing"; they would feel good about it rather than something to satisfy the management.

- C. The U.S. has done an excellent job in developing basic science and technology. We have even begun to seriously improve our manufacturing. However, nobody will buy reliable, low-cost but mediocre products. In today's Post Industrial Society, people are demanding a level of product excellence far greater than we have ever seen before. International competition is so great and so pervasive that the standards for products are equally high, not just in the Post Industrial affluent nations (U.S., Japan, Western Europe), but equally in the Newly Industrialized Countries (NICs) and the Third World.

The major successes in worldwide product sales belong to Japan and Germany. American industry must now make products that, at the very least, combine:

1. Marketing
2. Design (Engineering, Aesthetics, Ergonomics, etc.)
3. Manufacturing

In addition, our products must satisfy other societal and economic concerns: environmental, legal (including intellectual property), national and international standards, economics, etc.

This is the essence of Commercial Product Development.

We must get this mind set into American industry. Moving Federal Research funds towards Commercial Product Development will make a big improvement.

- II. We must further build up our apprenticeship and technician programs so that they are comparable to those programs found in Germany and Japan.

The basic problem here is the public perception of Apprentice/Technicians (A/T)

people is that they are ersatz neo-Engineers. The educational and industrial society see them as just as good as engineers and scientists, but not quite.

A/T education appears to be lower level Theory and Mathematics. The lower level Theory and Mathematics is elaborated sometimes up to the Four Year level but lacks emphasis on the practical matters and details in the factory and laboratory that make for product excellence.

It would help greatly if the A/T were recognized, treated and educated as important contributors on their own.

I do not believe any extra funds would be required. The people who are involved with A/T programs in industry and education are most anxious to succeed and would be grateful for Federal leadership.

Both of these programs should require very moderate federal funding and will make a big difference in our manufacturing and service industries. They would also substantially increase the amount of goods and services that we can export.

"CORRESPONDENCE TRACKING"

TYPE: ACTION

DOCUMENT NUMBER: 9120226

FROM: GOLDEN, WILLIAM T.

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 01/08/91

SUBJECT: REQUEST TO MEET WITH DR. MARY ANN MEYERS

ASSIGNED TO: D. Allan Bromley

ACTION REQUIRED: AS NECESSARY

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: Thomas Ratchford

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 01/19/91

FILE: EDUCATION

9120226

THE WHITE HOUSE

WASHINGTON

March 15, 1991

Dear Bill:

Unfortunately, when Dr. Maryanne Meyers called me to set up an appointment on January 29 it turned out that on that day I was completely unavailable. Of course I look forward to meeting and talking with her, and we have arranged that the next time she comes to Washington, I shall make every attempt to make sure that she gets on my calendar.

Thanks for your efforts in getting us together.

With all best wishes,

Sincerely yours,



D. Allan Bromley
Assistant to the President
for
Science and Technology

Mr. William Golden
Carnegie Commission on Science and Technology
40 Wall Street
New York, New York 10002

9120226

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*Through January 20, 1989

January 8, 1991

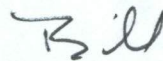
Dear Allan:

Dr. Mary Ann Meyers, a friend of many years from the administration of the University of Pennsylvania, has just become President of the Annenberg Foundation^{*} which, heretofore, has been funded by Ambassador Annenberg on an entirely personal basis.

Dr. Meyers is a fine, thoughtful, responsible, and personable young woman. The primary focus of the foundation's attention will be science and math education for grades K-12. I encouraged her to call you, and I encourage you to see her on some convenient occasion when she is in Washington in the near future. The foundation can be a very constructive influence in the private sector, and I'm confident that a little of your time devoted to get to know her will be time well spent.

With warm regards,

Sincerely,



William T. Golden

Dr. D. Allan Bromley, Director
Office of Science and Technology Policy
Old Executive Office Building, Suite 358
17th St. & Penn. Ave., NW
Washington, DC 20506

^{\$} 2.1 billion

"Document Control"

TYPE: INFORMATION DOCUMENT NUMBER: 9120127
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: MEISELS, GERRY

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 01/04/91

SUBJECT: FEDERAL PLAN FOR REBUILDING ACADEMIC SCIENCE AND
ENGINEERING FACILITIES

DIRECTORATE STAFF
ASSIGNED: D. Allan Bromley ASSIGNED: D. Allan Bromley

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: Tom Ratchford

WHITE HOUSE TRACKING #: CONTACT PERSON:
REMARKS: PHONE: EXT:

OSTP RECEIVED: 01/18/91 DEPT RECEIVED:
FILE: P-EDUCATION
CENTRAL FILES:



COUNCIL OF SCIENTIFIC SOCIETY PRESIDENTS

1155 16th Street NW, Washington DC, 20036 • 202/872-4452 • FAX 202/872-4615

January 4, 1991

The Honorable D. Allan Bromley, Ph.D.
Assistant to the President for Science
and Technology
Director, Office of Science and
Technology Policy
Old Executive Office Building
17th St. and Pennsylvania Ave., N.W.
Washington, D.C. 20506

Dear Dr. Bromley:

The Council of Scientific Society Presidents (CSSP) would like to express its appreciation for your support in promoting the development of a federal plan for rebuilding academic science and engineering facilities.

Strengthening federal support of the academic infrastructure for research and teaching is a high priority of the Council. CSSP has written President Bush asking him to meet with Members of Congress to discuss this critical problem. (A copy of that correspondence is attached for your information.)

Please contact me or Dr. Eric Leber if we can be of any assistance to you in this important endeavor.

Sincerely,

Gerry G. Meisels

Attachment

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The views expressed by CSSP are a consensus of its members and do not necessarily represent the official positions of their respective organizations.

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Wilford R. Gardner
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Water Pollution Control
Federation



COUNCIL OF SCIENTIFIC SOCIETY PRESIDENTS

1155 16th Street NW, Washington DC, 20036 • 202/872-4452 • FAX 202/872-4615

January 4, 1991

The Honorable George Bush
The White House
1600 Pennsylvania Avenue, N.W.
Washington, D.C. 20500

Dear Mr. President:

The Council of Scientific Society Presidents (CSSP) commends you on your commitment toward improving the quality of our Nation's research and education in the basic and applied sciences and mathematics. We applaud the many initiatives you have established for mitigating the deficiencies in those critical areas of endeavor.

There is one particular deficiency that deserves your attention: the steady loss of adequate facilities and infrastructure for research and teaching in our colleges and universities.

At its recent (December 3-5, 1990) semi-annual meeting, the CSSP endorsed the efforts of Senator Terry Sanford and twenty-six of his Congressional colleagues to develop a strategy of investment in undergraduate and graduate facilities for research and research training and to implement that strategy in the budget for FY 1992.

We urge you to meet with Senator Sanford and his colleagues for discussions on the status and prospects of the academic infrastructure and to outline a federal facilities initiative seeking to ameliorate the serious problems in that area.

CSSP is an organization of the presidents of 57 professional scientific societies with a combined membership of about 1.4 million scientists engaged in the physical, mathematical, and life sciences and education, as well as interdisciplinary studies.

Please advise me if the Council can assist you or your associates in the Administration in your important related deliberations.

Sincerely,

Gerry G. Meisels

Gerry G. Meisels

1990 Executive Board

Chair: William F. Prokasy	Chair-Elect: Gerry G. Meisels	Secretary: Gordon L. Nelson	Treasurer: Clayton F. Callis	Members-at-Large: Judy Franz, Shirley Frye, Ivar Stakgold
Past Chair: Lynn Arthur Steen	Past Treasurer: Warren D. Niederhauser	Executive Officer: R. Eric Leber	Legal Advisor: L. Manning Muntzing	Science Policy Advisor: Mike McCormack

The views expressed by CSSP are a consensus of its members and do not necessarily represent the official positions of their respective organizations.

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9120127

FROM: MEISELS, GERRY

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 01/04/91

SUBJECT: FEDERAL PLAN FOR REBUILDING ACADEMIC SCIENCE AND
ENGINEERING FACILITIES

ASSIGNED TO: D. Allan Bromley

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: Thomas Ratchford

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 01/18/91

FILE: EDUCATION

THE WHITE HOUSE
WASHINGTON

January 7, 1991

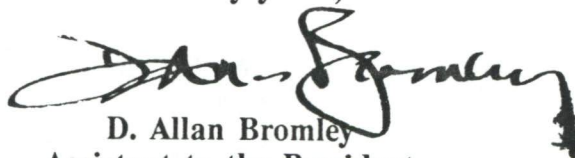
Dear Mr. Myers:

I appreciate your kind invitation to be the keynote speaker at your Annual Dinner scheduled to be held this spring in Wallingford. I apologize for the belated response.

Because we are very adamant about the education of our future scientists, I would have liked to contribute to CAPT's efforts to this end. However, the number of requests I receive is overwhelming and growing, and I find that this spring is extremely busy so I must regretfully decline your invitation.

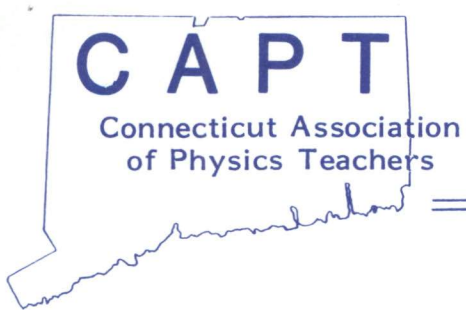
Thank you for thinking of me and let me offer my best wishes for a most successful Annual Dinner.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "D. Allan Bromley", written over the typed name.

D. Allan Bromley
Assistant to the President
for
Science and Technology

Mr. Fred Myers
President
Greenwich High School
10 Hillside Road
Greenwich, Connecticut 06830



Fred Myers, President
Greenwich High School
10 Hillside Rd
Greenwich, CT 06830

Off: 203/625-8022
Home: 203/269-5183

December 3, 1990

Dr. D. Allan Bromley
6716 Tulip Hill Terrace
Bethesda, MD 20816

Dear Dr. Bromley:

Please allow me to re-introduce myself: we met and spoke briefly at the reception for the Presidential Awards for Excellence in Science Teaching in October at the State Department. I am Connecticut's 1990 high school science recipient of the Award.

As President of the Connecticut Association of Physics Teachers (CAPT), I would like to invite you to give the keynote address at our Annual Dinner/Speaker Meeting to be held this spring. Typically about 60 high school physics teachers gather to chat over dinner and to listen and interact with a featured speaker. The meeting will most likely be held at Choate Rosemary Hall in Wallingford, CT.

CAPT is flexible regarding the date of the meeting. We are currently looking toward April or May for the function. Perhaps you can combine our meeting with a trip to Yale or the area. Unfortunately, CAPT's budget does not allow for a large honorarium. The topic of your presentation is completely up to you. We are certainly interested in the condition of science education in the nation as well as your views and experiences dealing with nuclear physics.

It is my sincerest hope that you will accept our invitation. Should you wish to respond to this invitation by telephone, I am usually easier to reach evenings at home.

Thank you very much for considering this invitation.

Sincerely,

*Let them that I
am over committed
for the coming Spring
and Summer and
Thank them for
the invitation*

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9120046

FROM: J.M. FARLEY, VICE PRESIDENT OF RESEARCH & ENGINEER

TO: PRESIDENT BUSH

DATE OF
CORRESPONDENCE: 01/03/91

SUBJECT: UPGRADE ACADEMIC RESEARCH FACILITIES

ASSIGNED TO: Thomas Ratchford

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: D. Allan Bromley

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 01/08/91

FILE: INTERNATIONAL - EDUCATION

January 3, 1991

President George Bush
The White House
Pennsylvania Avenue
Washington, DC

9120046

Dear Mr. President:

Your aggressive support of the commitment to upgrade the educational level in sciences of U.S. primary and secondary schools is commendable. Your stated goal of achieving parity of our students with the world's best by the year 2000 will help immensely our nation's universities to produce top-notch graduates.

However, this action may not be enough. We also need to upgrade our academic research facilities; they are in alarming condition. Inadequate space and equipment are barriers to both effective academic research and education programs. Inadequate facilities make it difficult for the academic community to recruit top-level faculty, causing a deterioration in the training of our current and future scientific and technical work force. It also makes it difficult to attract top-notch U.S. students to do graduate work in our universities. Furthermore, poor facilities hinder the universities to foster effective research relationships with industry, which in turn impedes the flow of technology from U.S. academic research facilities to industry; impacting negatively on U.S. world competitive standing.

Industry, and the nation, needs better science education and better academic research facilities to remain competitive. Your leadership to develop a comprehensive plan for investment in academic science facilities is very much needed. We hope that such a plan will become a national objective and be included in the budget for 1992.

Sincerely,

J. M. Farley
Vice President of
Research and Engineering

JMF/aw
AMW/4355

OFFICE OF THE
DIRECTOR

bcc: D. Allan Bromley, Assistant to the President for Science & Technology
P. Warren, Director, Higher Education Colloquium
W. G. Burwell, President, Industrial Research Institute, Inc.
D. H. Hoag, President & CEO, LTV Steel Company
D. L. Carroll, Vice President of Public Affairs, LTV Steel Company