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Collection/Office of Origin: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: Education Files

OA/ID Number: 62031
Folder ID Number: 62031-005

Folder Title:
Education: General (2) [1 of 3] [1991]

Stack:

Row:

Section:

Shelf:

Position:

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"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9121574

FROM: PRESS, Frank: NATIONAL ACADEMY OF SCIENCES

TO: Dr. D. Allan Bromley

DATE OF
CORRESPONDENCE: 05/28/91

SUBJECT: A THANK YOU LETTER FOR TAKING TIME TO PARTICIPATE IN
THE NATIONAL SUMMIT ON MATHEMATICS ASSESSMENT.

DIRECTORATE
ASSIGNED:

STAFF
ASSIGNED:

ACTION
REQUIRED:

STAFF
ACTION:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

DATE COMPLETED/DEPT:

COPIES TO: INTERNATIONAL/POLICY
FCCSET

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 05/31/91

FILE: EDUCATION

9121574
NATIONAL ACADEMY OF SCIENCES RECEIVED

2101 CONSTITUTION AVENUE, NW WASHINGTON, D. C. 20418

91 MAY 31 P 2: 55

OFFICE OF THE PRESIDENT

May 28, 1991

OFFICE OF THE
DIRECTOR

The Honorable D. Allan Bromley
Assistant to the President for Science
and Technology Policy
Executive Office of the President
Washington, D.C. 20500

Dear Dr. Bromley:

On behalf of the Mathematical Sciences Education Board and the National Academy of Sciences, I want to thank you for taking the time to join us at the National Summit on Mathematics Assessment.

I want to take this opportunity to say that the Academy strongly supports the high priority the Administration and the nation's governors have placed on U.S. education. The release of *America 2000* has served to focus a national spotlight on our educational needs and the President's address at the Assessment Summit was greatly appreciated by the educational leaders and policy makers in the audience.

The Academy is proud to be part of the national effort that President Bush, Secretary Alexander, and you are leading to achieve our country's educational goals.

Yours sincerely,



Frank Press
President

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9121562

FROM: HAMMOND, P. Brett: NATIONAL RESEARCH COUNCIL

TO: Dr. D. Allan Bromley

DATE OF
CORRESPONDENCE: 05/24/91

SUBJECT: A COPY OF THE COMMITTEE ON MADATORY RETIREMENT FOR
TENURED FACULTY'S REPORT, "ENDING MANDATORY
RETIREMENT FOR TENURED FACULTY: THE CONSEQUENCES FOR
HIGHER EDUCATION."

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE: OSTP DUE DATE:

DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: INTERNATIONAL/POLICY

WHITE HOUSE TRACKING #: CONTACT PERSON:

REMARKS:

DATE RECEIVED: 05/30/91

FILE: EDUCATION

9/21562
NATIONAL RESEARCH COUNCIL

COMMISSION ON BEHAVIORAL AND SOCIAL SCIENCES AND EDUCATION

2101 Constitution Avenue Washington, D.C. 20418

COMMITTEE ON MANDATORY RETIREMENT
IN HIGHER EDUCATION

TELEPHONE: (202) 334-2079

TELEX: 248664

FAX: (202) 334-3768

MILTON HARRIS BLDG., SUITE 160
2001 WISCONSIN AVENUE, N.W.

May 24, 1991

Allan Bromley
Assistant to the President for Science and Technology
The White House
1600 Pennsylvania Avenue
Washington, DC 20500

Dear Dr. Bromley:

As you are already aware, in the 1986 amendments to the Age Discrimination in Employment Act, Congress asked the National Academy of Sciences to study the potential effects on higher education of eliminating mandatory retirement for tenured faculty. The Academy appointed the Committee on Mandatory Retirement in Higher Education to conduct a two-year study in response to this request. The committee's report, which is now complete, addresses issues relevant not only to concerns about the ADEA exemption, but also to any college or university considering questions of an aging faculty and faculty retirement.

The report, Ending Mandatory Retirement for Tenured Faculty: The Consequences for Higher Education, contains analyses of early retirement programs, faculty performance evaluation practices, pension and benefit policies, tenure policies, and faculty ages and retirement patterns. The committee offers specific recommendations to Congress, colleges and universities, state higher education systems, and pension plan providers. It addresses questions such as: Do the special circumstances of tenured professors warrant continuation of the current exemption beyond 1993? What effect would the elimination of this exemption have on colleges and universities and their faculty? Are special policies or programs needed for the increasing number of older faculty on many campuses?

Since you may be interested in this study, I am enclosing a copy of the committee's report.

Yours sincerely,

P. Brett Hammond

P. Brett Hammond
Study Director

**ENDING
MANDATORY
RETIREMENT
FOR
TENURED
FACULTY**

**The Consequences for
Higher Education**

NATIONAL RESEARCH COUNCIL

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9121544

FROM: TRIVELPIECE, Alvin

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 05/22/91

SUBJECT: A THANK YOU FOR PARTICIPATING IN THE NATIONAL SUMMIT
ON MATHEMATICS ASSESSMENT AT THE NATIONAL ACADEMY OF
SCIENCES AND CONGRATULATIONS ON THE FCCSET REPORT.

ASSIGNED TO:

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: D. Allan Bromley
INTERNATIONAL/POLICY
FCCSET

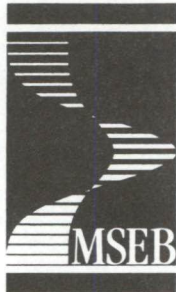
WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 05/29/91

FILE: EDUCATION*FCCSET



MATHEMATICAL SCIENCES EDUCATION BOARD

NATIONAL RESEARCH COUNCIL

818 Connecticut Avenue, NW • Suite 500 • Washington, DC 20006
(202) 334-3294 • Facsimile: (202) 334-1453

9121544
RECEIVED

91 MAY 29 A 9:30

May 22, 1991

OFFICE OF THE
DIRECTOR

The Honorable D. Allan Bromley
Assistant to the President for Science
and Technology Policy
Executive Office of the President
Washington, D.C. 20500

Dear Dr. Bromley: *Alan*

On behalf of the Mathematical Sciences Education Board, thank you for being a part of National Summit on Mathematics Assessment at the National Academy of Sciences on April 24th.

Congratulations on the fine product of the FCCSET Committee on Education and Human Resources. The Administration is poised with strong leadership in key positions to make maximum use of the federal resources for mathematics and science education.

The Summit was well received in the mathematics community and we appreciate your support of the reform effort.

Sincerely,

Alvin W. Trivelpiece
Chairman
Mathematical Sciences Education Board

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9121446

FROM: WHITE, Robert M.: NATIONAL ACADEMY OF ENGINEERING

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 05/10/91

SUBJECT: A COPY OF " MATHEMATICAL SCIENCES, TECHNOLOGY, AND
ECONOMIC COMPETITIVENESS".

ASSIGNED TO:

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: D. Allan Bromley
INTERNATIONAL/POLICY
INDUSTRIAL

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS: Enclosure to International/Policy for Education.

DATE RECEIVED: 03/15/91

FILE: EDUCATION

9121446

NATIONAL ACADEMY OF ENGINEERING



RECEIVED

2101 Constitution Avenue, N.W.
Washington, D.C. 20418

Office of the President
(202) 334-3200 / Fax (202) 334-1680

91 MAY 15 P 5: 00

May 10, 1991

OFFICE OF THE
DIRECTOR

D. Allan Bromley
Assistant to the President
Office of Science and Technology Policy
The White House
Washington, DC 20506

Dear Allan:

It gives me great pleasure to send you a copy of the report
from the National Research Council Board on Mathematical Sciences:

*Mathematical Sciences, Technology, and Economic
Competitiveness*

The report contains a number of carefully chosen case studies
from five industries--aerospace, automobiles, semiconductors and
communications, petroleum, and telecommunications--where the
mathematical sciences have either made significant contributions to
the quality or to the shortening of the design cycle of a commercial
product or service. The cases demonstrate, very persuasively, the
importance of mathematics in modern industrial operations and make
a strong argument in favor of high-quality, relevant mathematics
education in both our primary and secondary schools, as well as in
colleges and universities.

Sincerely yours,

Robert M. White
President

RMW/mk
Enclosure

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9121567

FROM: SANDS, Donald E.: NATIONAL SCIENCE FOUNDATION

TO: Dr. D. Allan Bromley

DATE OF
CORRESPONDENCE: 05/08/91

SUBJECT: LETTER TO MS. LOCKWOOD REGARDING HER LETTER OF
04/01/91 TO WALTER MASSEY ON THE SUBJECT OF THE
NATIONAL'S GOALS FOR IMPROVED MATHEMATICS & SCIENCE
EDUCATION AND THE SMART PROGRAM.

DIRECTORATE
ASSIGNED:

STAFF
ASSIGNED:

ACTION
REQUIRED:

STAFF
ACTION:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

DATE COMPLETED/DEPT:

COPIES TO: INTERNATIONAL/POLICY
D. Allan Bromley

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS: *Enclosure to DAB.*

DATE RECEIVED: 05/31/91

FILE: EDUCATION

9121567

NATIONAL SCIENCE FOUNDATION
1800 G STREET, N.W.
WASHINGTON, D.C. 20550

Directorate for Education and
Human Resources

May 8, 1991

Ms. Rowan Lockwood
1124 Post Drive
Rockford, Illinois 61108

Dear Ms. Lockwood:

Dr. Walter Massey has referred your letter of April 1, 1991 to the Directorate for Education and Human Resources for reply.

It is very important to meeting the nation's goals for improved mathematics and science education that we reach students in inner city schools, and volunteer efforts are critical to achieving these aims. We applaud the work you have done in creating the SMARt program, and we wish you continued success as you extend it to other states.

Your description of the SMARt program points out the need for support and volunteers from industry. The National Science Foundation supports the development of partnerships with the private sector that will apply the scientific expertise that exists in business and industry to the improvement of precollege science and mathematics education. I have enclosed a copy of the guidelines of that program; please call me or Dr. Donald Douglas at 202 357-7751 if you are interested in discussing the potential of this program for assisting with SMARt.

Moreover, as requested by Dr. Massey, I am forwarding a copy of your letter and enclosure to Dr. Alan Bromley, the Assistant to the President for Science and Technology.

Sincerely yours,

Donald E. Sands

Donald E. Sands,
Section Head, Networks and
Teacher Preparation

cc: Dr. Massey

PRIVATE SECTOR PARTNERSHIPS TO IMPROVE SCIENCE AND MATHEMATICS EDUCATION

Program Solicitation

DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES
DIVISION OF TEACHER PREPARATION AND ENHANCEMENT
PRIVATE SECTOR PARTNERSHIPS PROGRAM

SUBMISSION DEADLINES:

FORMAL PROPOSALS: *FEBRUARY 15, 1991, AUGUST 15, 1991*



NATIONAL SCIENCE FOUNDATION

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9121363

FROM: HOGEN, Charles R.: MERCK COMPANY FOUNDATION

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE:

SUBJECT: RE: THE MERCK CENTENNIAL AWARDS IN UNDERGRADUATE
SCIENCE EDUCATION.

ASSIGNED TO:

*Prof acknowledge comment
please*

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: D. Allan Bromley
INTERNATIONAL/POLICY
LIFE SCIENCES

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 05/08/91

FILE: EDUCATION

Merck Company Foundation

Post Office Box 2000
Rahway, New Jersey
07065-0900
(201) 855-2042

Charles R. Hogen, Jr.
Executive Vice President

May 1991

Dr. D. Allan Bromley
Assistant to the President
Office of Science and Technology Policy
Old Executive Office Building, Room 358
17th and Pennsylvania Avenues, N.W.
Washington, DC 20506

9121363
RECEIVED
01 MAY 8 410:17
OFFICE OF THE
DIRECTOR

Dear Dr. Bromley:

As a research-intensive health products company, Merck has a vital stake in the recruitment, education, and training of scientists. Merck, therefore, shares the national concern of educators and policy makers that the number of young people electing careers in science must be increased. In observance of its Centennial, Merck has translated this concern into a program of contributions to private higher education: The Merck Centennial Awards in Undergraduate Science Education.

The Merck Centennial Awards are designed to recognize exemplary efforts by colleges and universities to improve the quality of science education in the nation's K-12 schools and to encourage school-age students, particularly women and minorities, to consider careers in the sciences. We invited independent colleges and universities in the 16 states and Puerto Rico where Merck has a significant employee presence to nominate existing programs that have benefitted school-age students or precollege teachers and that held promise for even greater impact through further development.

The enclosed brochure describes the results of what we consider to be an extraordinary competition. The seven winners of the Merck Centennial Awards were chosen from among 93 applications that included many outstanding programs. We believe that each of the Centennial Award winners has demonstrated a truly distinctive and effective means of both broadening students' horizons to include science as a career choice and providing them with the knowledge and skills necessary to pursue it.

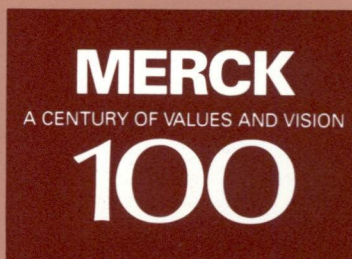
Innovative programs in science education such as these can make an important contribution toward meeting the future demand for well-trained scientists. I hope you will enjoy learning about these outstanding programs.

Sincerely,

CR. Hogen Jr.

Enclosure

**The
Merck
Centennial
Awards
In
Undergraduate
Science
Education
Award
Winning
Programs
1991**



In 1891, George Merck came to the United States from Germany to establish a branch of his family's fine chemical business. He succeeded in expanding the enterprise from a satellite office to an independent, integrated firm, which over the last 100 years has grown to become the largest pharmaceutical company in the world. His vision, and that of his successors, inspires our sponsorship of programs designed to help future generations of scientists realize their educational and career ambitions.

The Merck Centennial Awards in Undergraduate Science Education recognize the exemplary efforts of private liberal arts colleges that have taken the initiative to improve the quality of elementary and secondary school science education. These efforts are not necessarily unique, but

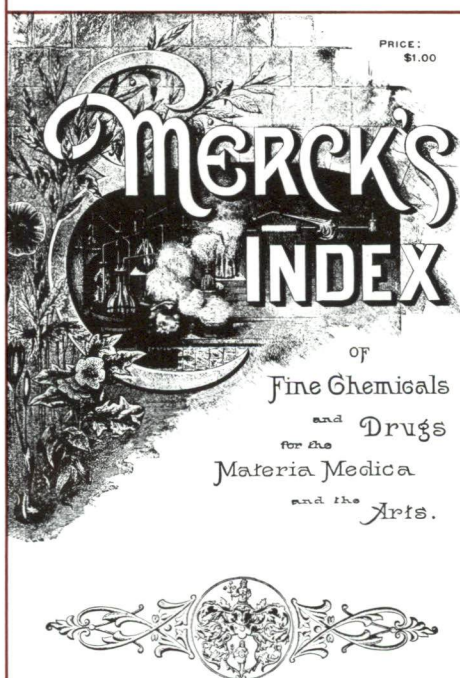
rather represent creative and effective responses to the crisis in U.S. science education. The Centennial Awards will be used to expand these successful programs and, we hope, encourage other colleges to replicate them.

With the assistance of the Consortium for the Advancement of Private Higher Education (CAPHE), the Centennial Awards program was designed to focus on private liberal arts colleges. Historically, these schools have educated a remarkably large share of future scientists. Their traditional commitment to innovation, therefore, deserves encouragement. The competition was open to private colleges and universities in sixteen states and Puerto Rico where Merck has a significant number of employees.

The response was very encouraging; more than 90 entries were received. We have been very impressed by the efforts these institutions are making to improve precollege science and mathematics education.

This publication highlights the seven award-winning programs that hold promise to inspire similar initiatives on other campuses. These awards also acknowledge the important role that independent colleges will play in educating the next generation of scientists and scientifically literate citizens. We congratulate the seven award-winning colleges and universities and invite your attention to their efforts.

*Albert D. Angel
Vice President, Public Affairs,
Merck & Co., Inc.
President, The Merck Company Foundation*



The

Centennial

Awards

Program

In observance of its centennial, Merck & Co., Inc., is both looking back on its distinguished past and setting its sights on the future. As a research-intensive corporation, Merck has always had a vital stake in education. The Company's capacity for service as well as its corporate livelihood continue to depend on able, well-trained, and creative minds. As an innovator, Merck must fix its sights on the future. There could be no more fitting celebration of either past accomplishment or future promise than for Merck to support efforts to restore, sustain, and enhance the quality of science education at all levels.

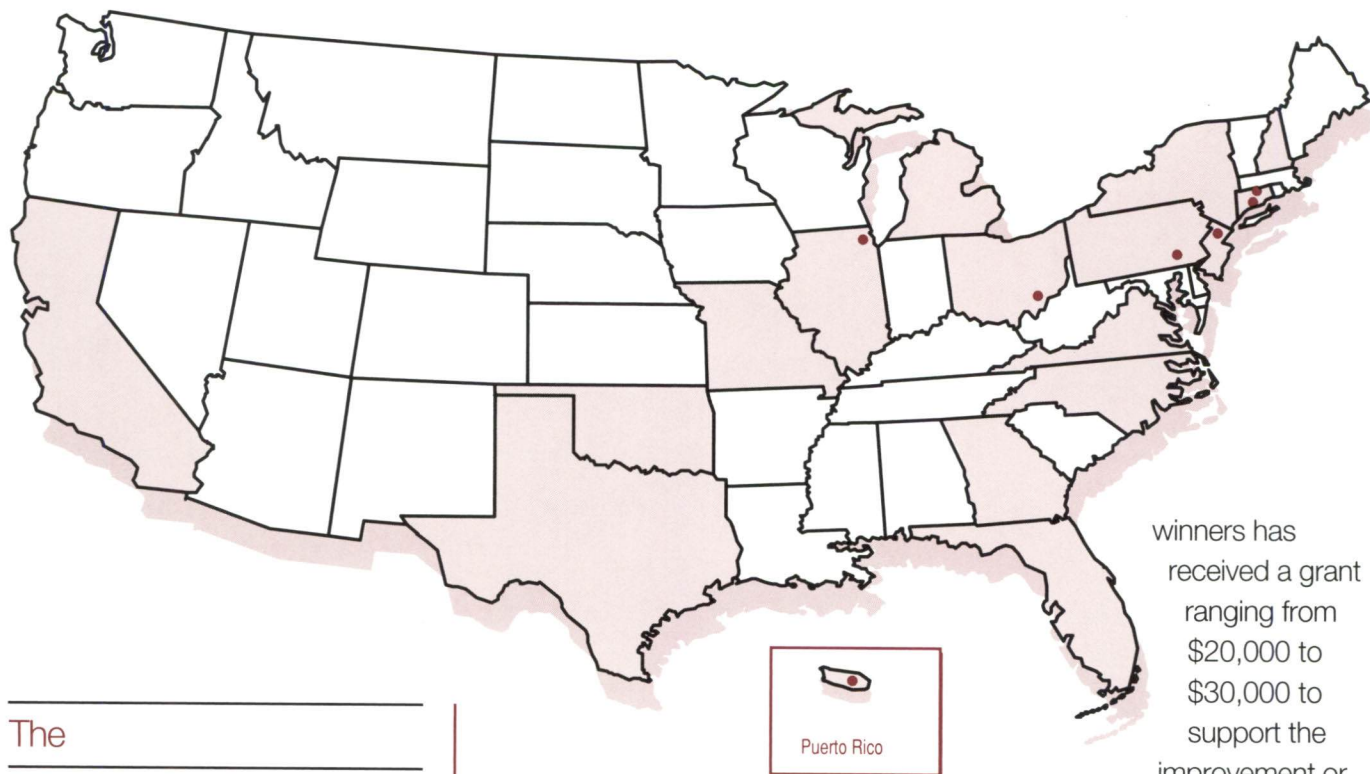
The Merck Centennial Awards in Undergraduate Science Education are intended to recognize and reward exemplary efforts by private liberal arts colleges and universities to improve the quality of precollege science and mathematics education and to encourage school-age students, particularly women and minorities, to consider research or teaching careers in the natural and physical sciences. The Centennial Awards is the second competition Merck has sponsored for private liberal arts colleges in order to recognize outstanding programs in science education. In 1989, the Innovation Awards in Undergraduate Science Education program recognized ten colleges for their achievements in four broad areas: strengthening the undergraduate major, attracting more students into the sciences, scientific literacy, and linkages to schools.

Institutions eligible to compete for the Merck Centennial Awards included over 400 four-year, independent colleges and universities located in states where

Merck has a significant employee presence. They include the Commonwealth of Puerto Rico, and California, Connecticut, Florida, Georgia, Illinois, Michigan, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Texas, and Virginia.

The institutions were invited to submit brief descriptions of existing science programs that have benefitted K-12 students or teachers and that held promise for even greater impact through further development. The program descriptions included a statement of the program's goals and objectives, identified its innovative and distinctive components, offered evidence of its impact, and outlined how support of up to \$30,000 (with an equal amount in matching funds raised by the institution) could be used to improve or expand the program.

MERCK
A CENTURY OF VALUES AND VISION
100



winners has received a grant ranging from \$20,000 to \$30,000 to support the improvement or

expansion of their program.

Award winners were selected for the quality of their current programs as well as for the projected impact of their proposed improvements or enhancements and the potential for replication by other institutions. The award-winning programs share several distinctive qualities: they show fresh and creative thinking, demonstrate sensitive and imaginative responses to the science education needs of K-12 students and teachers, and are educationally sound, effective, and cost-efficient.

Each of the projects receiving a Merck Centennial Award deserves the attention of educators committed to improving the quality of K-12 education in the natural sciences and mathematics.

The

Applicants

The Foundation received a total of 93 applications from 86 colleges and universities. The applicants were representative of the diversity of the independent college sector within the eligible states. They included some of the nation's most prestigious and selective colleges as well as institutions with special local missions. The Centennial Award winners also reflect this diversity.

The

Selection

Process

and

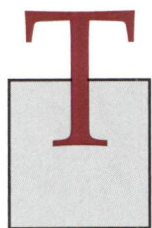
Criteria

Applications were reviewed in two stages by a panel of respected and knowledgeable scientists and educators. Following the review of all first-stage submittals, 25 institutions were invited to prepare full proposals and respond to questions raised by reviewers.

After the final proposals were reviewed, the selection committee made the difficult choice of seven award recipients. Each of the

Dickinson College, Carlisle, PA

FOCUS Program



talented minority high school students have participated in Dickinson College's multidisciplinary summer science and mathematics program since 1987. For three consecutive summers, rising sophomores, juniors, and seniors live on campus and experience first-hand the collaborative ways scientists go about addressing problems.

During the first summer, students are introduced to the scientific method. Over a period of two weeks, faculty from Dickinson's biology, chemistry, geology, physics and astronomy, and mathematics departments acquaint students with their respective disciplines in the form of a single problem or example. Differences in methodology and terminology are highlighted and discussed.

In the second summer, the integrative and interdisciplinary nature of the scientific enterprise is emphasized by focusing on a specific topic of interest to students—the search for extraterrestrial intelligence (SETI). Students explore the history of life in the universe through the “Drake Equation,” which concerns the probability of life existing on other planets. Students also engage in hands-on laboratory activities and take a field trip to the Goddard Space Flight Center in Greenbelt, Maryland.

In order to encourage FOCUS participants to pursue science and mathematics at highly competitive academic institutions, the students take a regular, three-week, college-level environmental science course during the third summer of partici-



pation. They sit along side college students and often discover that they are academically competitive with them.

Of the 16 students in the original FOCUS cohort, 13 completed the program. Eleven of these students have gone on to college, and the remaining 2 plan to attend. More than half of the students in college are majoring in mathematics or science, and all feel that the FOCUS program helped prepare them for the rigors of college-level study.

With its Merck Centennial Award, Dickinson plans to add a

FOCUS students examine slides of pond samples.

third week to the first two years of the program. This extra week will enable students to conduct more detailed experiments. In the second year, the additional week will permit students to engage in computer modeling of SETI scenarios, analyze possible communication signals from SETI sources, and participate in laboratory activities at planetariums and observatories.

A new cohort of 12-16 students enters the FOCUS program every other year. The program is structured such that one summer the program serves cohorts in their first and third years, and the next summer it serves only the cohort in its second year. During the academic year, Dickinson's faculty correspond with the FOCUS students and their high school counselors. They also assist the students with their high school science projects.

Dickinson College was founded in 1773. Located 18 miles southwest of Harrisburg, Pennsylvania, the college enrolls 2,100 men and women.

●● *I was able to enjoy science really for the first time; it was always my least favorite subject. The hands-on aspect was really good. In high school it's just not as interesting.* ●●

*Virginia Frazier,
12th grade,
Steelton-Highspire High School*

For two weeks in the summer, teams of school teachers and Marietta College faculty join together to introduce economically disadvantaged young women in the middle school grades (5-9) to the joys of science and the excitement of scientific careers. Each day, 100 girls cooperatively engage in scientific problem solving through hands-on, discipline-focused discovery laboratories designed to simulate the scientific environment.

The laboratories are supported by daily sessions on mathematics as a gatekeeping skill and workshops on adaptive skills and careers. The mathematics sessions are coordinated with the discovery laboratory planned for the day so that the mathematics skills the girls are taught form an essential part of the laboratory work. In these sessions, the students learn about the integral relationship between mathematics and science and, more importantly, they learn that mathematics is something they can do.

Designed especially for women, the adaptive skills and careers workshops focus on team-building skills that support future career success, assertiveness, public speaking, and other leadership skills. WITS also involves a series of sustaining activities to reinforce the lessons learned over the summer. Throughout the academic year, the girls periodically return to Marietta and engage in science activities conducted by trained college students.

As part of a chemistry experiment, fourth-grade WITS students develop invisible ink.

●● *The WITS teachers* ●●
made science and math fun. ●●

*Gina Gatten,
7th grade,
Lowell Elementary School*

A follow-up evaluation indicated that well over 80 percent of student-participants believed that the program increased their skills in science and mathematics, felt that the program expanded their career options, and influenced their ideas about the role of women in science and engineering.

With its Merck Centennial Award, Marietta plans to expand the geographic and demographic base from which the WITS program draws its students and teachers. Marietta has already established ties with Stillman College, a historically black college in Alabama, in order to bring minority students and

their teachers into the program. Marietta would also like to attract economically disadvantaged students from neighboring West Virginia and other parts of nearby Appalachia.

The Merck Centennial Award will also be used to develop more sustaining activities. These activities include developing science projects designed to foster independent experiences in scientific inquiry that students can take back to their schools and conduct under the supervision of project staff and trained teachers, campus-based activities for the fall reunion sessions, and opportunities for groups of WITS participants to prepare and present the results of their projects to peers and teacher-participants. In addition, Marietta plans to develop ongoing academic alliances among college faculty and school teachers of similar disciplines.

Located in a small town in southeastern Ohio, Marietta College borders on the federally defined area of Appalachia. Marietta College was founded in 1835 and enrolls 1,000 students.



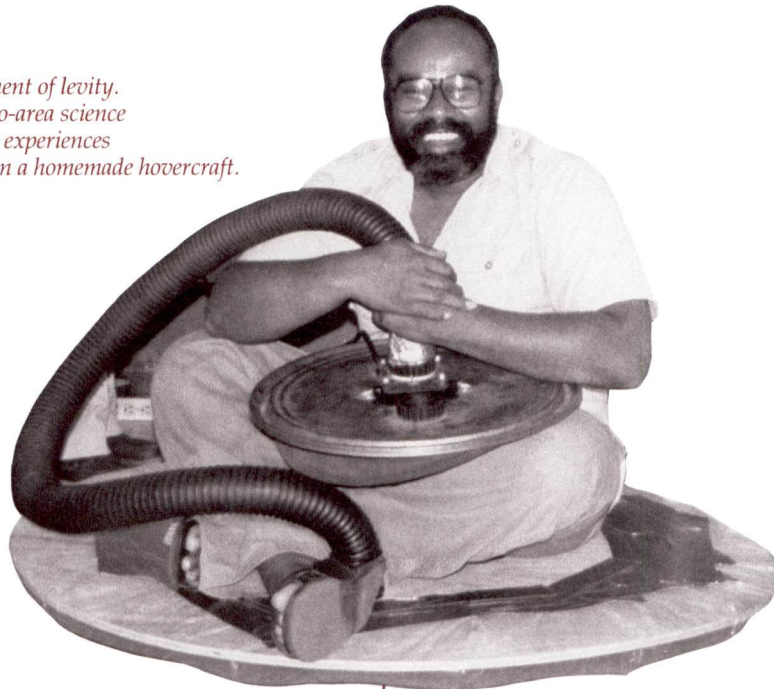
Educational Partnerships and Summer Institutes Program

For several years, Roosevelt University has conducted a series of highly successful summer science and mathematics institutes for high school teachers, using the Woodrow Wilson Institutes as a model. Over 90 percent of the teachers who have been through the program report that they use the teaching techniques and information obtained at the institutes. In addition, they conduct more in-class demonstrations that require critical thinking, data evaluation and interpretation, and have shared their knowledge with other teachers.

The Merck Centennial Award will enable Roosevelt to create four similar workshops for elementary and middle school teachers, in recognition of the need to improve instruction and interest students in these subjects at an early age. One science and one mathematics institute will be developed for each school level. The workshops will be designed and taught by teams of Roosevelt faculty and school teachers. These teams will produce instructional manuals and materials for participants to take back to their classrooms.

The science institutes will emphasize a hands-on approach to science and scientific problem solving in elementary and middle school science education. Instructional units centered on scientific themes will be developed for each grade level. These units will be supported with classroom activities

*A moment of levity.
Chicago-area science
teacher experiences
flight on a homemade hovercraft.*



and bibliographies of science trade books written for students that present science and scientific concepts in vivid and memorable ways in order to integrate science instruction with reading comprehension.

The mathematics institutes will concentrate on those aspects of mathematics education highlighted by the National Council of Teachers of Mathematics as areas most in need of change. Teachers will learn to use manipulatives that promote

understanding of mathematical concepts. They will also learn techniques for increasing mathematical thinking and problem-solving skills and applying them in situations that arise naturally in students' daily lives.

Follow-up sessions, which will be conducted during the academic year, will focus on a selected topic and include additional materials to take back to the classroom. Teachers will be encouraged to bring colleagues to these sessions.

Institute participants will be recruited primarily from Chicago-area public schools that are members of Roosevelt University's Educational Partnership Program. The majority of these schools are located in black and Hispanic areas of Chicago; a large percentage of the teachers are members of racial and ethnic minority groups.

Founded in 1947, Roosevelt University is located in downtown Chicago, in the heart of Chicago's cultural center. Approximately 85 percent of Roosevelt's 6,400 students come from the greater Chicago metropolitan area.

●● *The institute has been extremely helpful in bringing better ideas to the classroom. It is a wonderful program; my students will benefit immensely from my experience in it.* ●●

*Cheryll Brooks,
Teacher,
Near North High School*

Designed to motivate high school students to plan for and pursue a science or science-related career, the Universidad del Sagrado Corazon Young Scholars Program provides 15 high school students with an intensive five-week residential summer educational experience. The program offers students interdisciplinary science seminars and workshops not found in the school curriculum and aims to improve their performance in their regular science and mathematics courses. It also helps increase students' awareness of ethical values and principles in the scientific world and enhances students' leadership skills so that they become role models in their own schools.

In addition, students attend seminars on scientific research and scientific methodology. They are required to complete a small research project designed by program mentors and present their findings orally and in writing at the end of the session. They also must submit a proposal for a research project they plan to conduct during the follow-up phase of the program. These projects are completed during the school year with the help of their faculty mentor and high school teachers.

As part of the follow-up phase, the students' high school teachers participate in seminars and workshops tailor-made for them by project staff. In particular, they highlight areas of the schools' science and mathematics curricula and teaching methodologies that are in need of improvement or

11th grader compares the effect of vanilla and almond extracts on bacteria cultures

●● *The Young Scholars Program experience served as the platform for my professional future. The laboratory experiences have given me the opportunity to apply the new knowledge acquired and also have made me realize all the things I can do with proper training.* ●●

*Fernando Torres,
12th grade,
Academia del Sagrado Corazon*

updating based upon the Young Scholars' performance in the program. Thus the students, their teachers, their classmates, and the schools all benefit from the program.

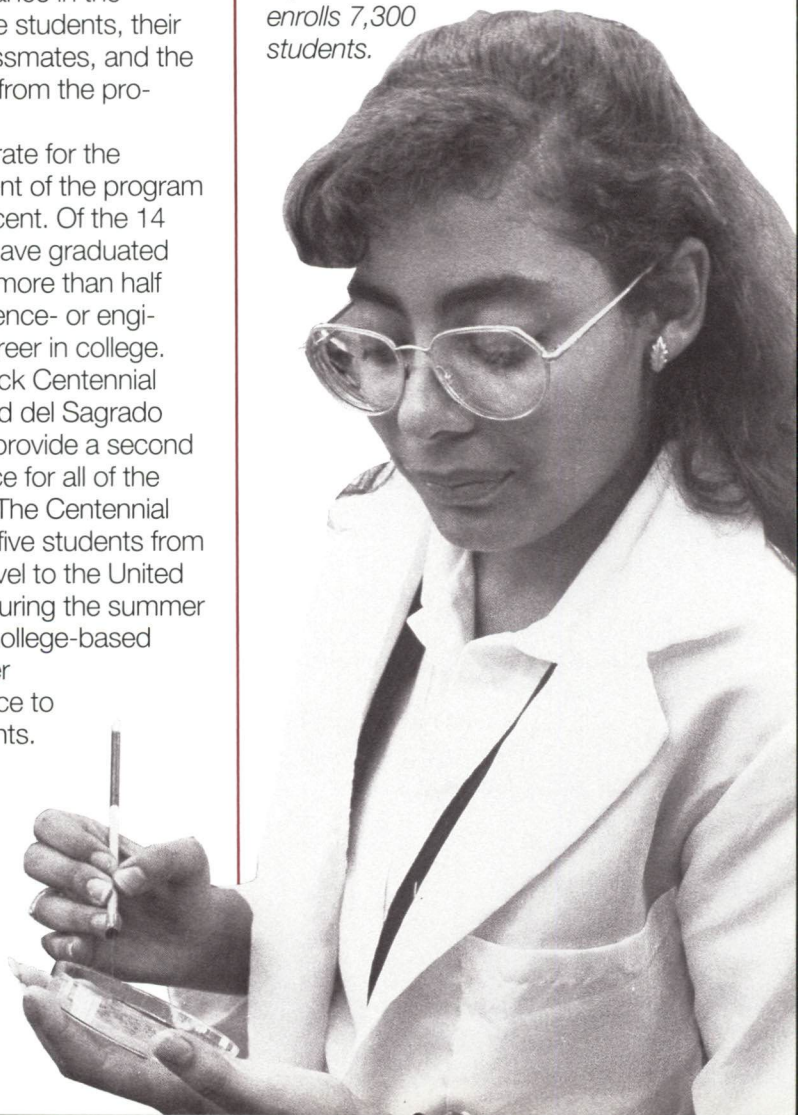
The retention rate for the summer component of the program has been 100 percent. Of the 14 participants who have graduated from high school, more than half are pursuing a science- or engineering-related career in college.

With their Merck Centennial Award, Universidad del Sagrado Corazon plans to provide a second summer experience for all of the Young Scholars. The Centennial Award will enable five students from each cohort to travel to the United States mainland during the summer to attend special college-based programs that offer research experience to high school students. Five other students will be given the opportunity to take a basic science or mathematics

course at Sagrado Corazon for college credit and the remaining five students will be offered summer employment at local research organizations.

The Centennial Award will also be used to bring the Young Scholars together for four science seminars during the year between the summers of participation in order to maintain a high level of motivation and to reinforce further their knowledge of science and science-related fields.

Universidad del Sagrado Corazon is a Catholic, comprehensive, coeducational institution located in Santurce, Puerto Rico, in the heart of San Juan. The university was founded in 1935 and enrolls 7,300 students.



Saint Joseph College, West Hartford, CT

Adventures in Science

Some students perceive science as boring and irrelevant, but not those enrolled in Saint Joseph College's Adventures in Science program. Since 1986, the program has successfully lit a spark of scientific curiosity in over 350 young women and minority students at the middle school level (grades 5-7) and encouraged them to think of science as a viable and exciting career option.

Several times each semester, groups of 20 students from West Hartford schools come to the college with their teachers for 90 minutes of active inquiry-based science. Students are given problems they can evaluate and solve themselves. Their "adventures" include extracting pigment from red cabbage and using the extract to test the acid/base nature of household substances, creating a simulated acid rain "lake" and using ground egg shells to neutralize it, and exploring paleontology through reconstructing animal bones.

Each month the students are given two follow-up experiments to take back to their schools and share with their teachers and fellow students. They are provided with written procedures and lists of inexpensive "everyday" materials and apparatus. Saint Joseph's undergraduate science and mathematics majors assist with these school-based, follow-up activities. This experience provides the college students with new opportunities to work with young students and consider careers in science teaching.



Two fifth-grade girls investigate food dyes using paper chromatography.

Students participating in Adventures in Science have demonstrated an increased interest in science, are more likely to select challenging science and mathematics courses, and show confidence and readiness to assume leadership roles. In addition, an increasing number of schools wish to have students participate in the program.

With its Merck Centennial Award, Saint Joseph College plans to extend the program to more young women and minorities in the predominantly black and Hispanic schools of Hartford and create a network of teachers prepared to

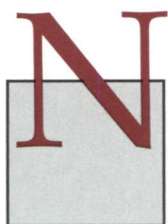
conduct in-service workshops for their colleagues in other schools. Adventures in Science students will be invited back to the college for periodic conferences to discuss their school and extracurricular science experiences.

The Centennial Award will also support planning for Saint Joseph's long-range goal of providing continuing opportunities to Adventures in Science students during their high school years. In the future, Saint Joseph anticipates that Adventures in Science students will be able to participate in its Buddy and Challenge Programs. The Buddy Program allows highly motivated high school students to work with college students on research projects, while the Challenge Program permits qualified high school seniors to take a college science course.

Saint Joseph College is a Catholic, women's college located in suburban West Hartford 4 miles from downtown Hartford. The college was founded by the Sisters of Mercy in 1932 and enrolls 1,200 undergraduates.

●● *Thank you for the spark you ignited in my child. Prior to your program, my daughter had little interest in science. She looked forward to your weekly sessions and even asked for a chemistry set this Christmas.* ●●

*Francine Christiansen,
mother of Gyllian,
5th grade,
Duffy School*



Now in its 25th year, Seton Hall University's Upward Bound Program provides students from low-income, largely minority families in the greater Newark area with an intensive six-week, on-campus summer session of academic courses, tutoring, and personal and career counseling. Students also participate in 15 intensive Saturday sessions during the school year. The faculty who teach in the Upward Bound Program are a select group of teachers who have excelled in their fields and have demonstrated commitment to their students. All are employed in the same urban schools that the students attend.

Ninety percent of participating students have completed the program and over 80 percent have continued their education. Of those students going on to college, an average of 15 to 20 percent major in science and mathematics.

Although every science and mathematics course in the Upward Bound Program has a computer component, the students and teachers come from schools where computers are often scarce and computer use and instruction is minimal. Seton Hall University thus plans to use its Merck Centennial Award to help its Upward Bound faculty earn a certificate in computer education.

Seton Hall anticipates that by interacting with teachers who are knowledgeable about computers, students will gain the confidence and competence to take college-level science and mathematics

●● I enjoy teaching and love working with children. My involvement with the Upward Bound Program is, therefore, a great pleasure and enables me to contribute to the betterment of students' lives. ●●

Edward Nemath,
Science Instruction and
Curriculum Supervisor,
Ridgefield Public Schools

classes that require computer expertise. In addition, Seton Hall expects the benefits of the certificate program to spread through area schools as Upward Bound teachers share their expertise with colleagues and students and as Upward Bound students share their knowledge and enthusiasm with fellow students.

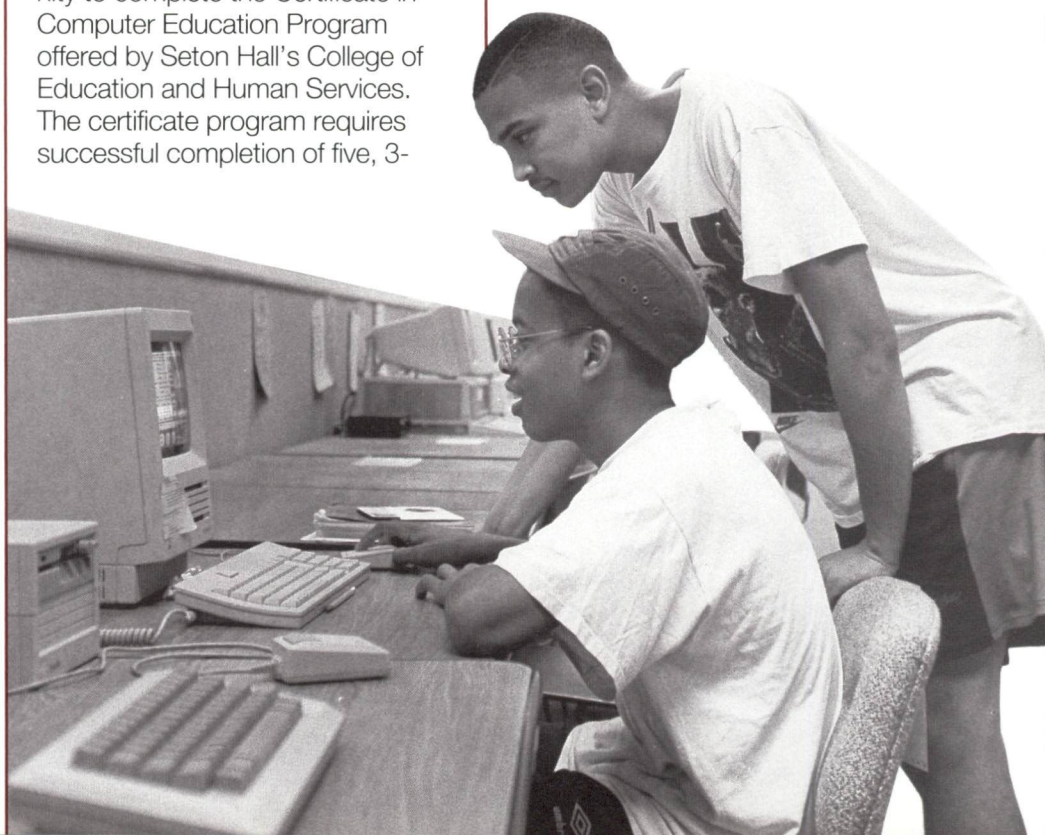
A minimum of 12 Upward Bound faculty will have the opportunity to complete the Certificate in Computer Education Program offered by Seton Hall's College of Education and Human Services. The certificate program requires successful completion of five, 3-

credit courses. All of the courses are offered in the late afternoon, evening, and summer sessions. Most participants complete the program in 12 to 18 months. The course credits can be applied toward a master's degree in Instructional Design and Technology.

Upon completion of the certificate program, Upward Bound faculty will be expected to use the computer as a teaching tool across the curriculum and teach basic programming to interested students. Seton Hall hopes that certificate recipients will become part of a network that tests and critiques new educational software and that they will discuss the software needs of urban schools with professional software writers.

Located 14 miles from New York City, Seton Hall University is a Catholic institution that welcomes students of all denominations. The university was founded in 1856 and enrolls 4,200 undergraduates.

Upward Bound students use computer simulations to explore science concepts.



Wesleyan University, Middletown, CT

Project to Increase Mastery of Mathematics and Science (PIMMS)

The distinguishing feature of Wesleyan University's Project to Increase Mastery of Mathematics and

Science is its multiplier effect. Upon completion of this two-summer residential program, participating school teachers become agents of change in their schools and school districts. Since PIMMS began in 1984, over 350 teachers have completed the program. Through the workshops and other in-service activities they lead, they reach over 10,000 colleagues a year.

PIMMS Fellows participate in courses and seminars designed to deepen their command of science and mathematics, help them develop more active "hands-on" learning, increase their awareness of symbiotic relations between mathematics and science, and prepare them to use technical aids that enhance the teaching and learning of mathematics and science.

With its Merck Centennial Award, Wesleyan University will begin a three-week nonresidential satellite program on the campus of Trinity College in downtown Hartford. The satellite program will serve teachers from grades 5-8 whose family responsibilities prevent them from joining a residential program. Eligible teachers will be drawn from Hartford schools that serve large numbers of ethnic and racial minorities. Many of these teachers are expected to be members of minority groups as well.



PIMMS teachers examine mutant bacteria colonies used in DNA replication studies.

Although half the Fellows will concentrate on mathematics and half on the sciences, the program will stress their genuine integration. The mathematics Fellows will focus on mathematics content and pedagogical techniques. The science Fellows will participate in an integrated biology and chemistry course during the first summer and an earth science and physics course the second.

●● *I thought about mentioning some of the many ways PIMMS helped me. Rather, the focus should be on the scores of teachers PIMMS helped me help, and upon the legions of young people those teachers have helped and the legions yet to come. All those lives have been touched and made richer.* ●●

*Gordon Turnbull,
Science Teacher,
Daniel Hand High School*

In the afternoons, Fellows will come together for sessions that focus on the content and application of various national science and mathematics curricula. Participants will also learn to use computers and other technologies to enhance teaching and learning. Once a week, the Fellows will take field trips to research centers to become familiar with the ways science is applied.

During the course of the academic year, the Fellows will again meet for three follow-up sessions in order to extend the summer's activities, share teaching experiences, and cement friendships and collegial relationships.

Wesleyan University is located in the small-town setting of Middletown, Connecticut. It was founded in 1831 and enrolls 2,700 students. Trinity College, where the satellite program will be conducted, is located in Hartford, Connecticut. It was founded in 1823 and enrolls 1,900 students.

Dickinson College

Carlisle, PA 17013

Contact: *Stephen MacDonald*

Associate Dean of the College

(717) 245-1384

Marietta College

Marietta, OH 45750

Contact: *George Banziger*

Dean of Continuing Education

(614) 374-4723

Roosevelt University

Chicago, IL 60605

Contact: *Brigitte Erbe*

Director, Educational

Partnership Program

(312) 341-3868

Universidad del**Sagrado Corazon**

San Juan, PR 00914

Contact: *Zaida Gracia*

Project Director

(809) 728-1515

Saint Joseph College

West Hartford, CT

Contact: *Sr. Claire Markham*

Assistant to the President

(203) 232-4571

Seton Hall University

South Orange, NJ 07079

Contact: *Leroy Wilson, III*

Director, Upward Bound Program

(201) 761-9419

Wesleyan University

Middletown, CT 06457

Contact: *Robert A. Rosenbaum*

University Professor of

Mathematics and the Sciences,

emeritus, and Director of PIMMS

(203) 347-9411

Recipients

of the 1991

Merck Centennial

Awards in

Undergraduate

Science

Education

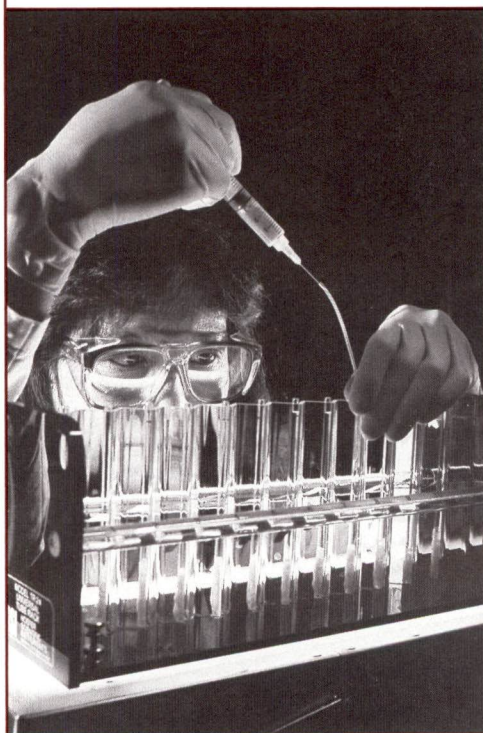
Merck & Co., Inc. traces its origins to a family apothecary in 17th-century Germany. George Merck emigrated to the United States in 1891 and transformed the family business in America from a branch office to an independent firm. Now an international organization, Merck & Co., Inc. discovers, develops, produces, and markets human and animal health products and specialty chemicals. Headquartered in Rahway, New Jersey, Merck has 37,000 employees worldwide, manufacturing facilities in 17 countries, and 17 research centers. For over a century, Merck has been in the vanguard of converting new scientific knowledge into breakthrough therapies that have enabled people to live longer and enjoy healthier lives.

The Merck Company

Foundation was established in 1957 and is the principal avenue of Company support for educational institutions. The Foundation has awarded grants of more than \$80 million since its inception. In addition to the Centennial Awards, ten independent colleges and universities received a total of \$150,000 in the Foundation's Innovation Awards in Undergraduate Science Education grant program in 1989.

The Consortium for the Advancement of Private Higher Education (CAPHE)

is a collaborative venture involving more than 30 corporations and foundations concerned with the future of independent colleges and universities. CAPHE's purpose is to aid private institutions in meeting the changing needs of students, employers, and society. CAPHE pursues that purpose through its own national program of grants and technical assistance, and by designing and managing grant programs on behalf of Merck and other corporations and foundations interested in supporting independent higher education.



Merck
Company
Foundation

P.O. Box 2000
Rahway, NJ 07065

THE WHITE HOUSE

WASHINGTON

June 4, 1991

Dear Mr. Hogen:

Thank you for your letter of May 1991 and the enclosed brochure that you were kind enough to send.

I am always eager to learn about any new aspects of educating future scientists and appreciate your informing me of your special awards program.

I encourage you to keep me up to date with events in the Merck Awards program. Again, thank you for thinking of me.

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
The Assistant to the President
for
Science and Technology

Mr. Charles R. Hogen, Jr.
Executive Vice President
Merck Company Foundation
Post Office Box 2000
Rahway, New Jersey 07065-0900

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9121363

FROM: HOGEN, Charles R.: MERCK COMPANY FOUNDATION

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE:

SUBJECT: RE: THE MERCK CENTENNIAL AWARDS IN UNDERGRADUATE
SCIENCE EDUCATION.

ASSIGNED TO:

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: D. Allan Bromley
INTERNATIONAL/POLICY
LIFE SCIENCES

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 05/08/91

FILE: EDUCATION

Merck Company Foundation

Post Office Box 2000
Rahway, New Jersey
07065-0900
(201) 855-2042

Charles R. Hogen, Jr.
Executive Vice President

May 1991

Dr. D. Allan Bromley
Assistant to the President
Office of Science and Technology Policy
Old Executive Office Building, Room 358
17th and Pennsylvania Avenues, N.W.
Washington, DC 20506

9121363
RECEIVED
91 MAY 8 AIO: 17
OFFICE OF THE
DIRECTOR

Dear Dr. Bromley:

As a research-intensive health products company, Merck has a vital stake in the recruitment, education, and training of scientists. Merck, therefore, shares the national concern of educators and policy makers that the number of young people electing careers in science must be increased. In observance of its Centennial, Merck has translated this concern into a program of contributions to private higher education: The Merck Centennial Awards in Undergraduate Science Education.

The Merck Centennial Awards are designed to recognize exemplary efforts by colleges and universities to improve the quality of science education in the nation's K-12 schools and to encourage school-age students, particularly women and minorities, to consider careers in the sciences. We invited independent colleges and universities in the 16 states and Puerto Rico where Merck has a significant employee presence to nominate existing programs that have benefitted school-age students or precollege teachers and that held promise for even greater impact through further development.

The enclosed brochure describes the results of what we consider to be an extraordinary competition. The seven winners of the Merck Centennial Awards were chosen from among 93 applications that included many outstanding programs. We believe that each of the Centennial Award winners has demonstrated a truly distinctive and effective means of both broadening students' horizons to include science as a career choice and providing them with the knowledge and skills necessary to pursue it.

Innovative programs in science education such as these can make an important contribution toward meeting the future demand for well-trained scientists. I hope you will enjoy learning about these outstanding programs.

Sincerely,

CR. Hogen Jr.

Enclosure

**The
Merck
Centennial
Awards
In
Undergraduate
Science
Education
Award
Winning
Programs
1991**

MERCK
A CENTURY OF VALUES AND VISION
100

Logged

"CORRESPONDENCE TRACKING"

TYPE: ACTION

DOCUMENT NUMBER: 9121398

FROM: ECKLIN, John W.

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 05/08/91

SUBJECT: REQUEST FOR ADVISE OR SUGGESTIONS TO HELP THE USA
GET SCIENCE BACK TO SCIENCE AND NOT MATH.

Copy - No reply is warranted - should go into "unanswered correspondence" file. J 5/20/91

ASSIGNED TO: INTERNATIONAL/POLICY

*CD > copies given
JH*

ACTION REQUIRED: IF APPROPRIATE,
DIRECT REPLY

SENDER'S DUE DATE:

OSTP DUE DATE:

05/24/91

DATE COMPLETED: 5/23/91

COPIES TO:

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 05/10/91

FILE: EDUCATION

9121398
RECEIVED
91 MAY 10 P 4: 47
OFFICE OF THE
DIRECTOR

Dr. D. Allan Bromley, Dir.
OSTP
The White House
Wash., DC 20500

Dear Dr. Bromley,

As you know President Bush not only wants more students to go into science but he wants the USA to regain preeminence in science worldwide.

He should know the AAAS, AIP, IEEE, NSF, NAS, NAE, etc. and their publications are against him and his goals. They want to stick to unproven math theories and will not publish anything on simple to conduct **actual** mind grabbing experiments that proves the math theory in error.

Enclosed are LstdE (25c) and TAJ-6 which are examples. Please advise what more I can do or what you might do or suggest I might do to help the USA get science back to science and not math. My letters to the editors of these organizations come back saying they have to many other letters to print even my short ones (125 words or less).

Yours truly,

W. Ecklin
John W. Ecklin
6143K Edsall Rd.
Alexandria, VA 22304
May 8, 1991

cc:file enc:as

cc/w/encl to Mrs. Patricia A. Rourke, Physics Dpt., Sci-Mat Fellow,
St. Agnes School, 400 Fontaine St., Alexandria, VA 22302.

HELMUT A. ABT, Managing Editor
Kitt Peak National Observatory
Box 26732, Tucson, Arizona 85726-6732
Telephone: 602-325-9215
Express: 960 N. Cherry Av., Tucson, AZ 85719
Facsimile: 602-323-4183
INTERNET: aab@nso.edu

Mr. John W. Ecklin
6143K Edsall Road
Alexandria, VA 22304

Dear Mr. Ecklin:

Thank you for the copies of your two letters of April 13 and 15, with the originals being sent to two newspapers.

There are several observational misconceptions in those letters. In the one sent to *The Sun*, it is incorrect to say that light from stars in red-shifted galaxies travels at a slower rate than light from stars in blue-shifted galaxies. The speed of light in vacuum is the same everywhere. In galaxies of different Doppler shifts the wavelengths and frequencies of the light are different, but the product of the two, namely the velocity of light, is the same.

There are a few nearby galaxies with blue shifts, but the corresponding velocities are all less than a few hundred kilometers per second. On the other hand, most galaxies have redshifts and the largest measured velocities to date are a hundred thousand kilometers per second. The galaxies in a cluster of galaxies have individual motions around the center of several hundred kilometers per second. If they didn't have those motions, the galaxies would all fall into the center of the cluster, just as the planets in our solar system would fall into the Sun if they did not have motions of dozens of kilometers per second at right angles to the radii from the Sun. But all distant galaxies have much larger redshifts that far exceed these small motions in clusters, and that is the basis for Hubble's finding of an expanding universe.

With regard to your letter to *The Times*, the Michelson-Morley experiment showed that the velocity of light is the same when it is measured in the direction of the Earth's rotation, in the opposite direction, or at right angles to the Earth's rotation. That could not be true in classical physics, and is one of the experimental verifications of the relativity theory.

$w = \text{wavelength} =$ space and is measured at the source.
Sincerely,
Helmuth A. Abt
Managing Editor
HAA:ih
cc: *The Sun*
The Times
Published by The University of Chicago Press, 5801 Ellis Avenue, Chicago, Illinois 60637
for THE AMERICAN ASTRONOMICAL SOCIETY

Dr. Helmut A. Abt, Ed.
The Astrophysical Journal
6143K Edsall Rd.
Alexandria, VA 22304

Dear Dr. Abt,

Thank you for your letter of April 26, 1991 in response to my April 13 letter to *The Sun* and April 15 letter to *The Times*.

From my letter to *The Sun*, Light from blue quasars leaves the quasars at c (300,000 kps) and light from red quasars leaves them at this same speed or c . Thus I did not say light from red quasars travel at a slower rate than light from blue quasars relative to the quasars. What I said was that light from blue quasars travels further toward the earth in a year than light from red quasars. Quite subtle.

If we measure (w) wavelength and (v) frequency at the same place then $c = wv$ always equals 300,000 kms. If we measure w at the source (which any good chemist can do) and v at the observer now $c = wv$ at the observer. One specific frequency of light, say a hydrogen alpha (H α) line, travels faster to us from a blue quasar than from a red quasar. This is due to the fact the H α line from the blue quasar comes to us with a higher frequency than the H α line from a red quasar. How??

In my April 15 letter to *The Times* I used a new laser police speed trap which is a much more precise source of light than the sodium lamp used in the Michelson-Morley experiment. The police will issue a ticket to a speeding car no matter in what direction the car speeds. Earth's rotation thus has nothing to do with either experiment.

The scientific errors are very subtle and tiny. You can't get to this error by using Einstein's math postulates or axioms.

Sincerely,

John W. Ecklin
6143K Edsall Rd.
Alexandria, VA 22304
April 30, 1991
Ph 703 751 4494

cc: *The Sun*
The Times

1991
SCI/DT-MARCH 1991
Feedback
science digest

More on Time Travel

It is too bad Mr. N.J. Schneiders didn't stretch his imagination by placing the twins on two identical space ships (except for the numbers 1 and 2). Each would travel at 0.9c so they could close at up to 1.8c or 0.99c relativistic. Also, he might have imagined a tachyon transporter which rapidly switches the twins between 1 and 2.

Whenever a twin observes another twin, he calculates the other's clock is not synchronized, the other's space ship is smaller and has more mass--yet nothing about the space ship he just happens to be on has changed (except for normal advancing time) from what it was on Earth.

How many times would the twins have to be switched between 1 and 2 before they conclude size, mass, and time do not change with speed but only appear to change because of the finite time required by all forces at a distance to travel?

all the twins see JOHN W. ECKLIN
Alexandria, VA
changing is 1+2.

PHYSICS TODAY APRIL 1991 150

Car closes at 55 mph on laser speed trap. Echo returns at $c + 55$ mph. In a light year light from a blue quasar travels further to earth than from a red quasar. More simple proofs c is no limit send SASE to JW Ecklin, 6143K Edsall Rd., Alexandria, VA 22304.

cc: DA Bromley OSTR

Next adv. for Physics Today.
Magic trick. Reduce entropy with room temperature superconductors. Kit and plans \$20. Plans \$5 and SASE. JW Ecklin, 6143K Edsall Rd., Alexandria, VA 22304.

Letter to the Editor
The Sun, P. O. Box 259,
Bremerton, WA 98310

$$c' = \frac{wv}{c}$$

$$c = wv$$

Editor, The Sun:

Physicists should return to the old drawing board (or their computers). See the article, "Physicist's computer helps explain why night is dark" April 17.

The speed of light is fixed so no light can travel faster than light relative to the source or target which is a scientific fact. That nothing can travel faster than c is a math postulate. Light from stars in red shifted galaxies comes to us slower than light from stars in blue shifted galaxies often called quasars. Stars age and disappear but galaxies are always forming new stars. Red shifts are mainly caused by the slingshot effect.

At the same time (certain distance) due to red shift) visible light is shifted into the infrared spectrum. ultraviolet light is shifted into the visible spectrum. Thus recession speed does not effect visibility or cause darkness. Shadows plus the very close proximity of the sun (relatively speaking) causes a dark sky at night.

Did you know there are blue shifted stars, galaxies and quasars? These blue shifts make Dr. Paul S. Wesson's computer analysis in *The Astrophysical Journal* for March at the very least incomplete if not totally in error. Due to blue galaxies not all of the universe is expanding. Interested scientists and amateur astronomers can write for more info to 6143K Edsall Rd., Alexandria, VA 22304.

Sincerely,

John W. Ecklin
6143K Edsall Rd.
Alexandria, VA 22304
4/13/91 Ph 703 751 4494--in Bremerton 206 692 4895

NOTES: 1. It is time for astronomers to not only consider just one frequency of light, the output of a laser, but they should never consider red shifts unless they also account for blue shifts. 2. An astronaut orbiting the earth when in full sunlight sees a dark night sky when he looks out an only open porthole in his ship's shadow where he can't see the earth. 3. A laser is a very powerful scientific tool as it has but 1 frequency (which fortunately is also visible) out of the sextillion frequencies of electromagnetic radiation. 4. Quasars appear extra bright as they are receding so fast their ultraviolet radiation (which has much more energy) is red shifted into the visible spectrum. 5. Some quasars recede so fast their X-rays are shifted into the visible or radio spectrum so they appear especially bright.

Letters Editor
The Times
P. O. Box 70
Seattle, WA 98111

Editor, The Times:

Scientists spend billions of tax dollars yearly to determine the age of the cosmos, the size of boxes at various locations, etc. Yet they haven't the guts to decide on something right under their noses as to whether c is a limit or no more than a constant to the source. Perhaps "Education Week" will help.

The fundamental principle of Einstein's math theory is beginning to impede scientific progress in the USA. He authoritatively postulated the velocity of light c (300,000 kms in a vacuum) is a constant no matter what. Professors still stress science is based on experiment even though they are quite sloppy about clarifying a physical law from a theory and especially a math theory.

Police now have laser speed traps and will soon be doing many experiments daily from stationary laser traps to closing speeding cars which will result in speeding tickets. The laser beam goes through essentially the same medium (air or atmosphere) to and from the car since it is a pencil lead size beam. This experiment proves c is a constant to the source or target (c) but not always to the observer or trap if there is any radial velocity.

These lasers output but one coherent and visible electromagnetic frequency at about 500 THz (500 trillion hertz). The one frequency transmitted (out of a sextillion electromagnetic radiation frequencies) is reflected at a higher frequency from a car closing at 70 mph. This means the transmitted signal travels at c in the atmosphere but returns through the same atmosphere at c plus 70 mph to increase the received frequency. Now science students can precisely know the cause of electromagnetic doppler which can travel in a vacuum unlike sound doppler. With today's experiments (laser traps) one frequency of light returns faster than c to produce a higher frequency. Up doppler or blue shifts (from stars, etc.) are due to light of many originating specific frequencies coming to us faster than c .

Sincerely,

John W. Ecklin
6143K Edsall Rd.
Alexandria, VA 22304
April 15, 1991
Ph 703 751 4494 Ph in Bremerton 206 692 4895--At daughter.

cc:file enc:cc and 4/13/91 letter to The Bremerton Sun.

SETI 21.1cm 1.42GHz 5.9x10⁻²⁶W

How do astronomers get other than 1.42GHz from H clouds?

NOTES: 25. $c = wv = 300,000$ kps when $w = \text{wavelength} = \text{space}$ and $v = \text{frequency} = \text{time}$ are both measured at the same place. $c' = wv$ when w is measured at the source and v is measured at the observer. Up doppler and c' exceeds c .

PHYSICS TODAY APRIL 1991 150

Car closes at 55 mph on laser speed trap. Echo returns at $c + 55$ mph. In a light year light from a blue quasar travels further to earth than from a red quasar. More simple proofs c is no limit send SASE to JW Ecklin, 6143K Edsall Rd., Alexandria, VA 22304.

cc: DA Bromley OSTR

Next adv. for Physics Today.
Magic trick. Reduce entropy with room temperature superconductors. Kit and plans \$20. Plans \$5 and SASE. JW Ecklin, 6143K Edsall Rd., Alexandria, VA 22304.

SCI/DT-APRIL 1991 9
Feedback
Science Digest

A Laser Experiment

In Feedback, last summer, B. A. Cobain knew something was radically wrong with relativity, then in Feedback during the fall M. J. Ireson concluded that light velocities vary with the velocity of the source or Newton's Galilean relativity. What we need now is a verifying experiment much simpler than re-analyzing Michelson-Morley's.

We can now buy tiny solid-state lasers the size of a grain of sand for \$10; their output frequency does not change with normal accelerations. Because a laser operates at about 500 trillion Hz, very small relative motions are easily detected. Try this experiment:

Tie a laser to a thread and let it swing back and forth between two detectors, D1 and D2. When the laser closes on D1 it gets up doppler (or a higher frequency than the laser always outputs) while simultaneously it is opening on D2, which gets down doppler (and vice versa).

How can D1 and D2 simultaneously get a frequency different from each other and the laser? Easy; you must add or subtract the slow velocity of the swinging laser to c as c is a constant to the source. Only at the extremes of each swing (or when the laser stops swinging) is c also a constant to both D's but then there is no relative motion and no doppler. This experiment can be conducted in the vacuum of space. 6143K Edsall Rd. JOHN W. ECKLIN
* 22304 Alexandria, Va.

FASTER THAN LIGHT S-1 "FTL"

Adrian Berry's story "Faster-Than-Light Spaceships" in the March issue of SAGA brings out quite forcefully the fact that scientists will never allow anyone to question the General or Special Theory of Relativity especially in science magazines.

Before 1960 I wrote and attempted to have scientists consider this thought experiment--if 2 particle accelerators were aimed directly at each other the particles in their streams would have a relative motion almost twice the speed of light.

Now it's been accomplished but unless some magazine editor with some guts publishes this fact we will have to go on believing in wormholes, bending time, changing mass in both weight and size, ad nauseum.

Scientists have spun particles in opposite directions and the relative motion of these particles was well above the speed of light which was well hidden and not brought out in the media. I don't know where the scientists stored the infinite mass which was created according to the theory of relativity.

RE: SSC
Man has always been limited only by his mind and by his science. Please SAGA don't let our scientists ever forget or hide what is occurring. The speed of light is nothing more than a constant relative to the source and is not a limit. There are no limits except as man believes.

SOUND OFF John W. Ecklin
SAGA - Aug 92

Dr. D. Allan Bromley, Dir.
OSTP
The White House
Wash., DC 20500

Dear Dr. Bromley,

As you know President Bush not only wants more students to go into science but he wants the USA to regain preeminence in science worldwide.

He should know the AAAS, AIP, IEEE, NSF, NAS, NAE, etc. and their publications are against him and his goals. They want to stick to unproven math theories and will not publish anything on simple to conduct **actual** mind grabbing experiments that proves the math theory in error.

Enclosed are LstdE (25c) and TAJ-6 which are examples. Please advise what more I can do or what you might do or suggest I might do to help the USA get science back to science and not math. My letters to the editors of these organizations come back saying they have to many other letters to print even my short ones (125 words or less).

Yours truly,

John W. Ecklin
John W. Ecklin
6143K Edsall Rd.
Alexandria, VA 22304
May 8, 1991

cc:file enc:as

cc/w/encl to Mrs. Patricia A. Rourke, Physics Dpt., Sci-Mat
Fellow, St. Agnes School, 400 Fontaine St., Alexandria, VA
22302.

Notes 15 & 19 cont'd.:-There is infinite magnetic energy in every atom from per-
petual particle spin even at zero degrees K. Iron is the best element known to get
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Ralph Baierlein, Physics Department, Wesleyan Univ., Middletown, CT 06457 also to Virgilio Acosta, 3509 Jeffery St.,
Silver Spring, MD 20906. Do you teach seniors the spin of the 4 unpaired electrons in iron atoms? If so I would
like to come to that class. So the point where the clip + ball touch a room temperature superconductor ???

Notes: 20. Do your share to decrease entropy, hang ball bearings. 21. Are ALL forces manifestations of energy? 22. I
come from the position flying saucers are real and therefore most of our laws of physics must be wrong. To be practical
flying saucers must travel faster than c, get thrust from energy without ejecting mass and have unlimited energy on
board. 23. Send SASE for patent 4,567,407. The basic design criteria of this motor/generator patent comes from
Tesla-don't use brushes and remember the most efficient way to transport energy is magnetism through iron, it is much
better than a drive shaft or controlling free electrons. 24. Any line in a spectrum, such as a hydrogen alpha line, is
just 1 v as a laser outputs. 25. c=vw=300,000kps when w=wavelength=space and v=frequency=time are both measured at the
same place. c=vw when w is measured at the source and v is measured at the observer. Up doppler and c' exceeds c.

Notes: 16. Is the point where the clip and ball touch the first room temperature superconductor? 17. Magnetism makes
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about how and when the cosmos began when they don't know why 2 pieces of touching steel retain far more magnetism much
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energy and the largest mass defect. By aligning the spin of 4 unpaired electrons in this atom it can radiate magnetic
energy at c far beyond the atom forever which we should learn to use. To get the infinite energy from an iron atom
you will have to wait a long time or use a lot of atoms. c=vw and c'=vw where c'=c+v and d=vw-c. Hx=4.5x10^14

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Science projects can teach students about a new energy source
Editor: Einstein said there is infinite energy in an atom but fission and fusion are one-time events to an atom which produce only an eensy, teensy, weensy bit of the energy from an atom. President George Bush wants more students to get into science and math. Recently while praising science teachers he urged them to use more interesting and inspiring hands-on experiments.

There are three very interesting hands-on experiments but students are seldom told about them in their text books because they are very poorly explained by our big science. If these were widely done students might be able to help scientists explain magnetic energy which is very clean and constant. Some school might even make a video recording that could be on educational TV nationwide.

Anything with motion has energy but can no motion also point to energy? Set a 1/2 inch diameter button magnet on a horizontal steel surface. Put a 3/8 inch diameter steel ball on top of the magnet, pull the ball to the edge of the magnet and release the ball. The ball will have a highly damped oscillatory motion above the magnet.

Tie a six inch thread to a paper clip. Tack the thread to overhang. Set the ball on top of the magnet and then touch the ball under the clip. Pull the magnet down and far away from the ball. The ball hangs below the clip until you shake the ball loose. To hang the ball below the clip again you must use the magnet again. Why do two pieces of touching steel retain much more magnetic energy much longer than one piece?

Get four 3/16 inch diameter rare earth magnets from Radio Shack, PN-1895. Get two 1/4 inch diameter ball bearings and have them touching on a smooth horizontal wood surface. Set magnets in line and an inch away from the balls. Nudge the magnets toward the balls. When they all come together a ball shoots out five feet or more. Students learn the magnetic induction of steel ALWAYS causes attraction. Strictly speaking this is still true so the ball must be repelled by clean magnetic energy. When we resolve the questions in these hands-on experiments will we have a new, unlimited and clean source of energy? With oil above \$40 per barrel we urgently need to find a new atomic energy source instead of nuclear.

John W. Ecklin
6143K Edsall Road
Alexandria, VA 22304

Laser speed traps disprove Einstein
Editor: → L+D+E ←
The fundamental principle of Einstein's math theory is beginning to impede scientific progress in the U.S.A. He authoritatively postulated the velocity of light c (300,000 kms in a vacuum) is a constant no matter what. Professors still stress science is based on experiment even though they are quite sloppy about clarifying a physical law from a theory and specifically a math theory.

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The laser beam goes through essentially the same medium (atmosphere or air) to and from the car since it is a pencil lead size beam. This experiment proves c is a constant to the source target (car), but not always to the observer or trap if there is any radial velocity.

These lasers output but one coherent electromagnetic frequency at about 500 THz (500 trillion hertz). This radiation of one single frequency is visible so we call it light. The one frequency transmitted is reflected at a higher frequency from a car closing at 70 mph. This means the transmitted signal travels at c in the atmosphere but returns through the same atmosphere at c plus 70 mph to increase the received frequency.

John W. Ecklin
6143K Edsall Road
Alexandria, VA 22304

Lost in Space Again
John Ecklin's Free for All letter on the speed of light "Lost in Space" (Cont'd.), Feb. 16, 1991, sounded authoritative but was wrong. Light is not like a baseball; it does not take on the speed of the object emitting it. A baseball thrown from a car has the combined velocity of the car and the throw itself. Shining a flashlight from a moving car (or bouncing a laser beam off it) has no effect whatsoever on the speed of the light. The fundamental principle behind Einstein's special theory of relativity is that the speed of light is a constant no matter what (it's the "c" in E=mc^2). Ecklin, and whoever reviewed his letter for publication, should go back and study basic physics. —Kevin Parker

Lost in Space
Robert M. Weiss and Richard C. Banks "Fall Lost in Space," Free for All, Feb. 21 almost explained a light year. Light from a blue-shifted quasar travels much farther toward the Earth in a year than light from a red quasar. Police will be proving this with their new laser speed traps. A good laser operates on only one coherent frequency out of the 320 trillion electromagnetic frequencies in the spectrum of white light. From a car closing at 55 mph, the laser gets back a higher frequency than it transmits, because the reflected signal from a car travels 55 mph faster than the speed of light in air. Most distant quasars have a radial motion toward or away from the Earth much faster than cars can travel.

John W. Ecklin
6143K Edsall Road
Alexandria, VA 22304

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John W. Ecklin
6143K Edsall Road
Alexandria, VA 22304

"INVITATION FOR DR. BROMLEY"

TYPE: INVITATION

DOCUMENT NUMBER: 9121210

SPEECH: YES NO

FROM: THOMPSON, Lisa A.: JOINT POLICY BOARD FOR
MATHEMATICS

DATE OF EVENT: 04/24/91

LOCATION OF EVENT: GEORGE WASHINGTON UNIVERSITY

TIME OF EVENT:

SUBJECT: INVITATION TO COMMEMORATE MATHEMATICS AWARENESS WEEK
APRIL 24-27, SPECIFICALLY A NEW MATHEMATICS EXHIBIT
AT G.W.U.

RSVP: 04/24/91

CONTACT PERSON:

CONTACT NUMBER: 202/994-6235

INVITATION ACCEPTED?

~~YES~~

NO

COPIES TO: INTERNATIONAL/POL

REMARKS:

4/26/91 - Letter arrived too late &
DAB had no time -
regretted! mnr

DATE OF LETTER: 04/18/91

DATE RECEIVED: 04/23/91

FILE: INVITATION*EDUCATION

9121210

JOINT POLICY BOARD FOR MATHEMATICS

OFFICE OF GOVERNMENTAL AND PUBLIC AFFAIRS • 1529 EIGHTEENTH STREET, N.W., WASHINGTON, D.C. 20036 • 202/234-9570

RECEIVED

91 APR 23 AM 11:42

April 18, 1991

OFFICE OF THE
DIRECTOR

The Honorable D. Allan Bromley
Assistant to the President
for Science and Technology
Old Executive Office Building
Washington, DC 20506

Dear Dr. Bromley,

We invite you to join us in commemorating Mathematics Awareness Week, April 21-27, 1991. In honor of the occasion, we have mailed to you a poster, entitled **Mathematics: It's Fundamental**, showcasing the excitement of mathematics and its importance to the progress of science, technology, and industry.

Activities celebrating the beauty and utility of mathematics will occur this week on college and university campuses throughout the country. Hundreds of students will participate in events of a mathematical nature, including field days, film screenings, problem-solving contests, career seminars, art contests, even a mathematical murder mystery contest.

Here in Washington, DC, a new mathematics exhibit will open at the George Washington University on April 24. Produced by members of the GWU faculty, the exhibit is a prototype of a permanent one that will travel to many of the Nation's science museums in the near future. Please make plans to view the exhibit, which will be open from 10 am - 7 pm through May 17. (For more information, please call 994-6235.)

Thank you for your enthusiastic participation in Mathematics Awareness Week 1991!

Sincerely,



Edward A. Connors
Director



Lisa A. Thompson
Assistant for Governmental Affairs

"CORRESPONDENCE TRACKING"

TYPE: ACTION

DOCUMENT NUMBER: 9121242

FROM: OFFICE OF PUBLIC AFFAIRS, THE WHITE HOUSE

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 04/24/91

SUBJECT: A REQUEST TO THE DIRECTOR OF PUBLIC AFFAIRS, BARRIE
TRAN FROM MICHAEL C. HYNES ASKING FOR PRESIDENT BUSH
OR A DESIGNEE TO WRITE AN ARTICLE FOR, "ARITHMETIC
TEACHER: MATHEMATICS THROUGH MIDDLE GRADES."

ASSIGNED TO: D. Allan Bromley

ACTION REQUIRED: AS NECESSARY

SENDER'S DUE DATE: 07/01/91

OSTP DUE DATE: 05/10/91

DATE COMPLETED: 5/1/91

COPIES TO: Steve Olson
Thomas Ratchford

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS: The assignment is for Steve Olson through DAB.

I spoke with Barrie Tran in the Office of Public Affairs about this, and he was going to contact the sender of the letter & request that he ask someone at the Department of Education, rather than the White House, to produce this article. So we can close this out.

Steve Olson

DATE RECEIVED: 04/26/91

FILE: EDUCATION

WhiteHouseTV

Claire Buchan - RNC

863-8500

Library here
or at RNC

TV + Radio Monitoring Services

THE WHITE HOUSE
WASHINGTON

RECEIVED

April 24, 1991
91 APR 26 PM 12 29

TO: Dr. Allen Bromley OFFICE OF THE
DIRECTOR

FROM: OFFICE OF PUBLIC AFFAIRS WFO
Room 195 OEOB, Ext. 2483

Attached is a request which came to our office asking for President Bush or a designee to write an article for Arithmetic Teacher: Mathematics Through the Middle Grades.

I have been in touch with Dr. Hynes's office telling them that their request is now with the Office of Science and Technology Policy.

Thanks for your help in this matter.

Tem

Dr. Bromley

9121242



UNIVERSITY OF CENTRAL FLORIDA

CENTER FOR EDUCATION RESEARCH AND DEVELOPMENT

ORLANDO, FLORIDA 32816-0250 (407) 823-5228 FAX (407) 823-5135

April 22, 1991

MEMO

To: Barrie Tran, Director of Public Affairs

From: Michael C. Hynes, Ph.D. (Editor of the Focus Issue on
Assessment)

Director of Research and Professor of Education

Subject: National Assessment of Mathematics Achievement

In an effort to keep the 85,000 members of the National Council of Teachers of Mathematics well informed on the issue of national assessment of achievement in mathematics, I would like to invite the President, or his designee, to write a "One Point of View" for our professional journal. **The Arithmetic Teacher: Mathematics Through the Middle Grades** seems to be a very appropriate forum for the administration to discuss its views on assessment of mathematics achievement since the initial target of national testing is proposed to be fourth graders.

Please find attached an example of a One Point of View taken from an earlier edition of the journal. The length of the manuscript is generally the same as in the example, but exceptions have been made for longer pieces. As these are opinion articles, there is no editing of the manuscript which would, in any way, alter the tenor or meaning of the writing.

Our timeline for publication would require a timely commitment to write the manuscript, and a deadline for submission of July 1, 1991. Publication would occur in February, 1992.

The NCTM Standards— Challenges for All Classrooms

By Shirley M. Frye

Just as the *Curriculum and Evaluation Standards for School Mathematics* generates excitement among our members and colleagues, the document also engenders questions from them. Educators and colleagues have asked questions about the standards and the implementing procedure at conferences and committee meetings, through the mail, on the telephone, and in personal conversations. From those submitted or posed, I have selected some typical questions to which to respond.

The responses are general rather than specific to particular standards. The intent is to assist with the important task of clarifying the purposes of the standards and explaining the various activities related to the challenges that the standards bring to all classrooms. I believe that individuals will commit to implementing and supporting the standards if they understand the entire project clearly.

1. What are the standards?

The standards are definitive statements about what we value in mathematics education. They describe the criteria for the curriculum of a quality mathematics program, the instructional conditions necessary for mathematics to be learned, and the methods of evaluating students' progress and curricular programs. Each curricu-



ulum standard for the levels K-4, 5-8, and 9-12 includes the content to be learned, the expected student outcomes, a discussion of the content, and examples that illustrate the particular focus. The evaluation standards describe the methods of gathering evidence to assess both students' performance and mathematics programs.

The *Standards* document is not a list of behavioral or performance objectives, and it is not a series of scope-and-sequence charts. Instead it is the benchmark of a challenging, but achievable, mathematics program for all students.

2. Why did NCTM think that the standards were necessary?

NCTM responded to the calls for reform found in such documents as *School Mathematics: Options for the 1990's* (Romberg and Stewart 1985)

and to the demands for a workforce better prepared in mathematics as outlined in *Workforce 2000* (Johnston 1987). Also, the Council reacted to the comparatively low performance of our students on standardized mathematics assessments as reported in the series of articles on the Second and Third NAEP Mathematics Assessment in the *Arithmetic Teacher* (Carpenter et al. 1980) and the *Mathematics Teacher* (Carpenter et al. 1983), in *The Mathematics Report Card* (Dossey et al. 1988), and in *The Underachieving Curriculum* (McKnight et al. 1987). The impact of technology, the changing workplace, and the need for an informed citizenry were also factors that challenged us as mathematics educators to create a new direction for school mathematics.

3. Should a professional organization such as NCTM get involved in curriculum issues that perhaps rightfully should be left to local and state or provincial education agencies?

A primary purpose of NCTM is to provide leadership in improving the teaching and learning of mathematics. In any profession, leadership comes from the collective expertise of its members from all geographic areas and grade levels. The organization of mathematics educators is the appropriate group to develop a vision of improved mathematics education for all students.

In 1980, NCTM's *Agenda for Action* set the stage for major changes in school mathematics. Now the *Standards* addresses the specific changes in curriculum and evaluation. NCTM

Shirley Frye is president of the National Council of Teachers of Mathematics. Currently she is the director of curriculum and instruction in the Scottsdale School District in Scottsdale, AZ 85256. She has also been a mathematics teacher and K-12 mathematics coordinator in this system and in Pennsylvania.

has established the standards as benchmarks against which local and state agencies can measure and compare their own scope-and-sequence outlines, syllabi, curriculum guides, and evaluation instruments. This visionary plan serves as a blueprint of new goals for the development of curriculum objectives, instructional materials, and assessment tools.

4. *Why shouldn't teachers and the public view the Standards as another attempt at "new math"?*

Perhaps they will if we do not communicate clearly to them that this program, which was developed by teachers, teacher educators, supervisors, and mathematicians, addresses more than content. Therefore, we must inform teachers and the public that the document includes what mathematics students need to know, how students are to achieve the identified curricular goals, what teachers are to do to help students develop their mathematical knowledge, and the context in which learning and teaching occur.

Lessons from the past have taught us that we must involve teachers in all the steps of curriculum development and implementation and that we must build a broad base of support among parents, business partners, and school administrators. Experience has revealed that the process of change requires time and acceptance and that the steps of change in people and programs are incremental. For these reasons, schedules and time lines for implementing the standards will vary with districts, schools, and individuals. Being realistic and forthright about these factors should distinguish this project from the attempts to implement the "new math."

5. *What is NCTM doing to promote the Standards?*

NCTM scheduled a national press conference to announce the release of the *Standards* prior to the mailing of a copy to each individual member. In addition, the Council commissioned a public relations firm to develop a videotape for public use, a speaker's kit for local adaptation, and a marketing strategy. This company also gave us an entrée to noneducational groups

and leaders who are influential advocates for the new focus in school mathematics.

We have asked our allied professional organizations to endorse the *Standards* and to support our dissemination efforts by having NCTM members speak at their conferences and write for their journals.

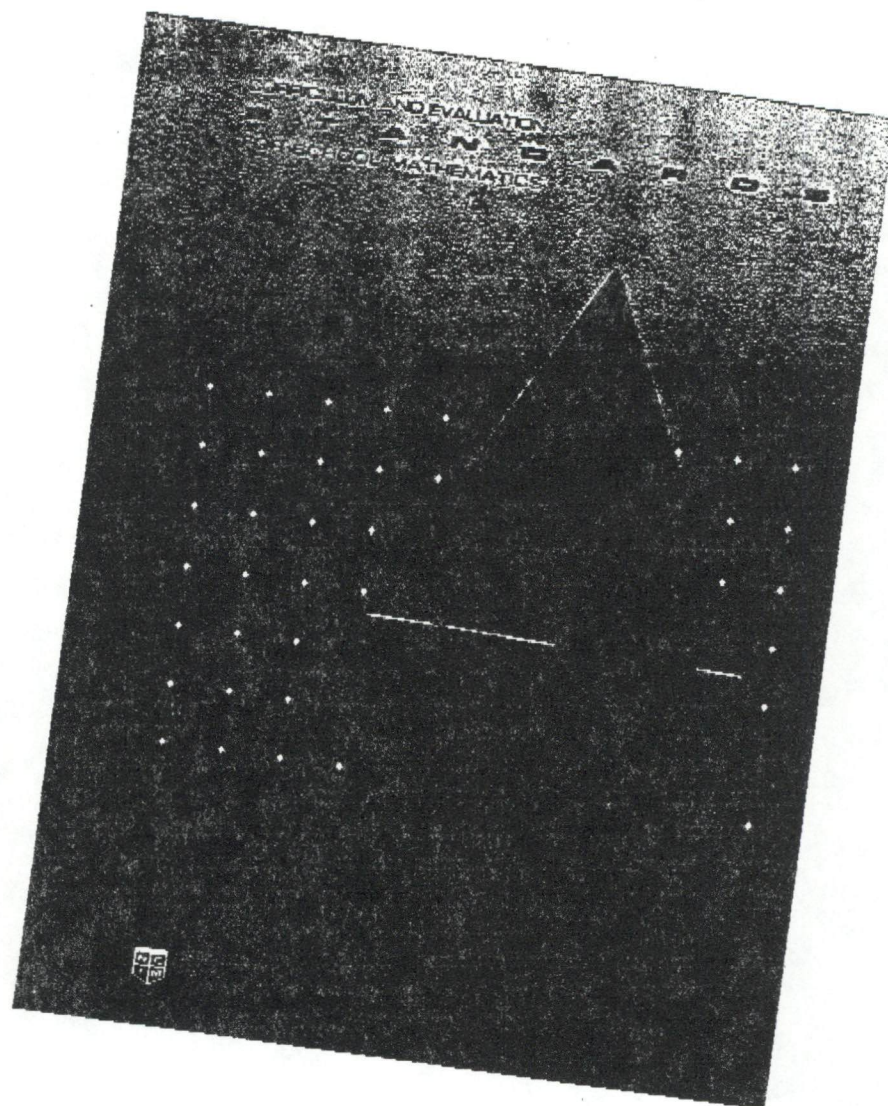
The *Executive Summary* (NCTM 1989) was sent to the decision makers who are the critical agents of change. Legislators, school board members, superintendents, and state and provincial leaders in education departments are needed to give the necessary support and to create a receptive environment for this new direction in mathematics classrooms.

Our 220 Affiliated Groups will be instrumental in promoting the *Standards* in their areas by preparing implementation strategies that meet local needs. At the 1989 Delegate

Assembly in Orlando, their leaders compiled a booklet of activities that Affiliated Groups can undertake during the next several years to follow the new directions for curriculum and instruction.

6. *How can NCTM get local and state or provincial education agencies and publishers to move toward an implementation of the standards?*

The publishers of texts, classroom materials, and tests, who participated in a special forum to give input to the draft of the *Standards*, have been keenly interested in, and supportive of, the new emphases. These groups will continue to use the standards to direct their work as long as teachers on selection committees request and adopt materials that reflect the standards. This situation means that we have a challenge to prepare teachers



to be effective curriculum developers and well-trained reviewers of materials.

It is worthwhile to note that since 1980, most publishers have followed the recommendations of the *Agenda for Action* and have been instrumental in highlighting problem solving in their current publications. These publishers give every indication of using the standards to guide their current and future development of materials.

7. *What other professional organizations and agencies are supporting the Standards?*

In a cooperative effort, the Association of State Supervisors of Mathematics, the National Council of Supervisors of Mathematics, the Council of Presidential Awardees, and the NCTM plan to prepare a cadre of leaders in each state who will conduct informative sessions appropriately planned for teachers, administrators, and community groups. This project is titled "Leading Mathematics Education into the Twenty-first Century."

The following organizations are among the many that are supporting the *Standards* through their publications and conference programs: Mathematical Association of America, Mathematical Sciences Education Board, Conference Board of the Mathematical Sciences, National Science Teachers Association, Association of Supervision and Curriculum Development, Council of Scientific Society Presidents, and National School Boards Association. The complete list of professional groups that are endorsers and supporters is found in the front of the document.

8. *Is NCTM making an effort to coordinate the many interrelated areas on which change depends?*

We are cognizant that a well-orchestrated plan must include corresponding changes in such areas as preservice and in-service education, public and parent awareness, curricular materials and assessment procedures, education of administrators and school boards, college entrance requirements, certification requirements, models of instructional strategies, and the use of technology.

Although these areas will be on our work agendas for years to come, we have a good start in many of them through the special projects of the Council's standing committees, editorial panels, and task forces.

The Task Force on the Addenda is developing publications describing other instructional examples and areas to which the standards apply. The mission of three other groups—the Task Force on Geometry; the Task Force on Discrete Mathematics; and the Task Force on Number Sense, Number Concepts, and Computation—is to develop models of instructional delivery for these topics. The Task Force on Professional Standards for Teaching is preparing to write a companion document to *Curriculum and Evaluation Standards for School Mathematics*.

The Committee for Implementing the Standards is coordinating all the schedules and monitoring the various activities that address the multitude of issues related to implementing the standards and reaching our goals.

9. *Since students vary greatly in ability and performance, how is it possible for all secondary school students to take a core program?*

First, we must believe that it is possible for all students to achieve our expectations. Then we must treat the student as the *constant* in our programs and treat time, materials, instructional strategies, and activities as the *variables*. The support and encouragement of parents, administrators, counselors, and communities will be needed as students work to attain mathematical power by learning to reason and communicate mathematically, becoming mathematical problem solvers, learning to value mathematics, and becoming confident in their own abilities. With self-confidence, hard work, and the skills of a good teacher orchestrating the variables, our students should be able to learn the core curriculum that compares favorably with that of other countries.

10. *Since teaching that focuses on concept development is more difficult than just presenting a few*

examples and assigning lots of paper-and-pencil practice, how will NCTM convince many teachers that teaching concepts is worth the extra effort?

No knowledgeable person ever said that teaching was easy. Teaching is hard work! Making it possible for every student to achieve mathematical power is indeed worth the effort. This power is the ability to explore, conjecture, and reason logically as well as use a variety of mathematical methods to solve nonroutine problems effectively. It is achieved not by doing just pencil-and-paper practice but through a variety of teaching and learning methods that enable students to progress successfully. As teachers, we are successful when our students are successful!

Students attain this success through an active process of "doing" mathematics, communicating their ideas, and working with others in solving and posing problems. The teacher is the key to creating such an instructional setting. I believe that teachers will commit to such practices that require time and effort because of their personal dedication to a high-quality mathematics program for all students.

11. *Why doesn't NCTM begin field-testing new textbooks, using the evaluation standards as the criteria, and publish the results?*

The diversity of the districts demands that the selection process for textbooks and other materials remain a local option. Field-testing is conducted in classrooms by school districts that establish their own criteria for study and evaluation. It is our hope that districts will develop curricular goals that reflect the outcomes described in the *Standards* and that they will select materials that fit the local needs and the recommended indicators for program evaluation.

12. *What do the standards mean to me as an individual teacher? What am I going to have to change? How will I be assisted in this endeavor?*

After a study of the document, you should assess your current beliefs

about how students learn mathematics, your familiarity with the new content and areas of emphasis, your instructional strategies, your assessment procedures, and your use of technology. By comparing them to those described in the *Standards*, you would determine what you need to learn and what you want to begin to change in a systematic and incremental way. For example, you might want to focus on connecting mathematics and other disciplines through applications or to initiate interviews and conferences as a way to assess students' understanding and progress.

You might require time to either convince yourself of the need for a topic or a method or prepare yourself for its inclusion in your program. The recommended use of manipulatives and calculators at all levels spells the need for new skills for every one of us.

Change is a process of growth rather than a movement to a plateau. You will change according to your own growth plan. You will be assisted by NCTM through our publications, conferences, and special projects related to the standards. Support will be offered through courses at colleges and universities, programs and activities of NCTM Affiliated Groups, and in-service opportunities of local school districts. Much of the encouragement will come from peers with whom you plan to commit to implementing the standards in an organized and reasonable way. We are aware that change is a long-term process and that exemplars expedite the conversion. Many successful programs already represent parts of the vision; they need to be shared as credible evidence that the standards can be realized.

13. *What strategies are being considered to involve teacher educators in both preservice and in-service education?*

The Task Force on Professional Standards for Teaching Mathematics is preparing a companion document that addresses standards for teaching, professional development of teachers, and evaluation of teaching. Guidelines for preservice, in-service, and post-baccalaureate courses will be used in

accreditation and will offer direction for teacher educators and their departments. Courses, which will be instrumental in preparing future teachers, must be taught in a manner that exemplifies exploring, conjecturing, reasoning, communicating, and problem solving. An old saying is that teachers teach the way they were taught.

14. *What in the Standards is new compared with current practice?*

These new major themes are woven throughout all levels: communication, reasoning, and connections. New topics include data analysis and discrete mathematics, and the usual content topics are either expanded or modified. The *Standards* makes specific recommendations about the increased and decreased emphasis that should be placed on certain topics, skills, and procedures at all levels.

The evaluation standards focus on assessment of students' performance and curricular programs, with an emphasis on the role of evaluative measures in gathering information on which teachers can base subsequent instruction. A key factor in the general assessment section is alignment, the agreement of the assessment with the curriculum.

For all students to be mathematically literate, the instructional strategies must include collaborative experiences, the use of calculators and computers, exploration activities that enable students to hypothesize and test, applications of mathematics, and experience in problem posing and writing.

Finally, the challenges to teach mathematics as an integrated whole and to link mathematics to the physical world are the relatively new focal points of the standards.

This succinct summary of the overall focus is found on the last page of the *Standards*:

"The National Council of Teachers of Mathematics has created a vision of—

- mathematical power for all in a technological society;
- mathematics as something one does—solve problems, communicate, reason;
- a curriculum for all that includes a

broad range of content, a variety of contexts, and deliberate connections;

- the learning of mathematics as an active, constructive process;
- instruction based on real problems;
- evaluation as a means of improving instruction, learning, and programs."

The *Curriculum and Evaluation Standards for School Mathematics* is the product of a concerted effort by NCTM to create a balanced curriculum that will furnish all students with a suitable and sufficient mathematics background to be productive citizens. As you read, study, and question the *Standards*, reflect on your own role and how you can accommodate and facilitate this challenge presented to mathematics educators. The opportunities for implementing the standards await each of us.

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91 APR 22 P2:39

UNIVERSITY OF CENTRAL FLORIDA

CENTER FOR EDUCATION RESEARCH AND DEVELOPMENT

ORLANDO, FLORIDA 32816-0250 (407) 823-5228 FAX (407) 823-5135

DATE: 4/22/91NUMBER OF PAGES: 6
(Including cover)TO: Barrie Tran FAX #: (202) 456-6218
Director of Public Affairs, White HouseFROM: Michael C. Hynes FAX #: (407) 823-5135
Director of Research

SPECIAL INSTRUCTIONS:

I will be attending the MSGB Assessment Meeting in
Washington. I have reservations for Tuesday and Wednesday
(4/23 & 4/24) at the Sheraton.If there are any problem with transmission of the fax, please
contact Kathy Winstead at (407) 823-5228.

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9121226

FROM: TRULY, Richard H.: NASA

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 04/22/91

SUBJECT: SEVERAL OF THE ACTIVITIES UNDERTAKEN BY THE NASA
WORKFORCE WHICH ARE ASSISTING IN THE NATIONAL
EDUCATION GOALS.

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: 04/23/91

FILE: EDUCATION



National Aeronautics and
Space Administration

Washington, D.C.
20546

Office of the Administrator

RECEIVED

91 APR 23 All : 43

9/12/226
APR 22 1991

The 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

OFFICE OF THE
DIRECTOR

Dear Dr. *Allan* Bromley:

As the Administration highlights education in the next few weeks, I thought you might find of interest several activities undertaken by the NASA workforce which are making a difference.

Feedback received from schools nationwide indicates that NASA efforts in support of National Engineers Week were a resounding success. Overall, nearly 500 employees from NASA Headquarters and NASA Centers taught, spoke with, and encouraged more than 31,000 students at 176 schools throughout our nation to consider careers in engineering and other technical disciplines.

Especially rewarding was the commitment of the NASA workforce to this volunteer activity and the creativity they displayed in attempting to reach a broad spectrum of young minds. For example, Bill Vance, a hearing impaired employee at NASA Langley Research Center, taught students at the Virginia School for the Deaf and Blind in sign language, and NASA Lewis Research Center hosted the Cleveland National Engineers Week Committee's annual "Egg Drop Contest" at a Lewis aeronautics drop tower.

Most importantly, that week of activity has started a continuing enrichment effort between the NASA workforce and many of the schools they visited. Teaching visits will continue throughout the year, and students will travel to NASA facilities to learn more about math, science and technical disciplines.

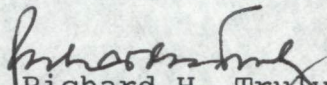
NASA has also undertaken an educational initiative involving the thirty corporations with whom we do the most business. This pilot program is a cooperative effort between NASA and the aerospace industry to assist America's educational system in attaining the National Education Goals. Our first step will be to develop an inventory which will provide, for the first time, a comprehensive understanding of the support these corporations are providing to assist realization of the National Education Goals. Completion of this first step will provide the foundation for

future cooperative activities and partnerships among participants in the NASA-Industry Education Initiative. NASA's objective is to spur increasing resource support to American education in a way that focuses that support on realization of the National Education Goals.

Another effort which NASA is in the midst of initiating focuses on recognizing and encouraging volunteer activities. NASA Headquarters and all NASA Centers are in the process of expanding their respective newsletters to include a continuing section of volunteer activities. These reports of volunteer activities will be forwarded to NASA Headquarters and the most noteworthy passed on to the Office of National Service. I mention this effort because I know that many of the volunteer activities will involve NASA employees working with their local schools.

These new activities will complement ongoing NASA and interagency activities supporting education. NASA will continue to work hard to support the President's leadership in this area and to challenge individuals to make a difference in their communities and in the nation which they serve.

Sincerely,

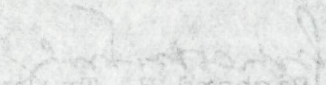

Richard H. Truly
Administrator

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Sincerely,


Richard H. Truly
Administrator

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION/SECRETARY

DOCUMENT NUMBER: 9121179

FROM: ALEXANDER, Lamar: THE SECRETARY OF EDUCATION

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE:

SUBJECT: A COPY OF THE PRESIDENT'S SPEECH AND THE "AMERICA
2000" PLAN.

ASSIGNED TO:

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: D. Allan Bromley
Ken Yale
Thomas Ratchford

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 04/22/91

FILE: EDUCATION

9121179



THE SECRETARY OF EDUCATION
WASHINGTON

RECEIVED

91 APR 22 A 9:33

OFFICE OF THE
DIRECTOR

Honorable D. Allan Bromley
Assistant to the President for
Science and Technology
The White House
Washington, DC 20500

Dear Allan,

Just wanted to be sure you had a copy of the
President's speech and the "America 2000"
plan right off the presses.

We're looking forward to working with you.

Sincerely,

Lamar

Lamar Alexander

Enclosures

THE WHITE HOUSE

Office of the Press Secretary

For Immediate Release

April 18, 1991

REMARKS BY THE PRESIDENT
AT PRESENTATION OF NATIONAL EDUCATION STRATEGY

The East Room

2:00 P.M. EDT

THE PRESIDENT: Thank you all for joining us here in the White House today. Let me thank the Speaker for being with us, and the Majority Leader; other distinguished members, committee heads and ranking members and very important education committees here with us today. I want to salute the governors, the educators, the business and the labor leaders, and especially want to single out the National Teachers of the Year. I believe we have 10 of the previous 11 Teachers of the Year with us here today, and that's most appropriate and most fitting.

But together, all of us, we will underscore the importance of a challenge destined to define the America that we'll know in the next century.

For those of you close to my age, the 21st century has always been a kind of shorthand for the distant future -- the place we put our most far-off hopes and dreams. And today, that 21st century is racing towards us -- and anyone who wonders what the century will look like can find the answer in America's classrooms.

Nothing better defines what we are and what we will become than the education of our children. To quote the landmark case, Brown v. Board of Education, "It is doubtful that any child may reasonably be expected to succeed in life if he is denied the opportunity of an education."

Education has always meant opportunity. Today, education determines not just which students will succeed, but also which nations will thrive in a world united in pursuit of freedom in enterprise. Think about the changes transforming our world. The collapse of communism and the Cold War. The advent and acceleration of the Information Age. Down through history, we've defined resources as soil and stones, land and the riches buried beneath. No more. Our greatest national resource lies within ourselves -- our intelligence, ingenuity -- the capacity of the human mind.

Nations that nurture ideas will move forward in years to come. Nations that stick to stale old notions and ideologies will falter and fail. So I'm here today to say, America will move forward. The time for all the reports and rankings, for all the studies and the surveys about what's wrong in our schools is passed. If we want to keep America competitive in the coming century, we must stop convening panels to report on ourselves. We must stop convening panels that report the obvious. And we must accept responsibility for educating everyone among us, regardless of background or disability.

If we want America to remain a leader, a force for good in the world, we must lead the way in educational innovation. And if we want to combat crime and drug abuse, if we want to create hope and opportunity in the bleak corners of this country where there is now nothing but defeat and despair, we must dispel the darkness with the enlightenment that a sound and well-rounded education provides.

MORE

Think about every problem, every challenge we face. The solution to each starts with education. For the sake of the future, of our children and of the nation's, we must transform America's schools. The days of the status quo are over.

Across this country, people have started to transform the American school. They know that the time for talk is over. Their slogan is: Don't dither, just do it. Let's push the reform effort forward. Use each experiment, each advance to build for the next American century. New schools for a new world.

As a first step in this strategy, we must challenge not only the methods and the means that we've used in the past, but also the yardsticks that we've used to measure our progress. Let's stop trying to measure progress in terms of money spent.

We spend 33 percent more per pupil in 1991 than we did in 1981 -- 33 percent more in real, constant dollars -- and I don't think there's a person anywhere who would say -- anywhere in the country -- who would say that we've seen a 33-percent improvement in our schools' performance.

Dollar bills don't educate students. Education depends on committed communities determined to be places where learning will flourish; committed teachers, free from the noneducational burdens; committed parents, determined to support excellence; committed students, excited about school and learning. To those who want to see real improvement in American education, I say: There will be no renaissance without revolution.

We who would be revolutionaries must accept responsibilities for our schools. For too long, we've adopted a "no fault" approach to education. Someone else is always to blame. And while we point fingers out there, trying to assign blame, the students suffer. There's no place for a no-fault attitude in our schools. It's time we held our schools -- and ourselves -- accountable for results.

Until now, we've treated education like a manufacturing process, assuming that if the gauges seemed right, if we had good pay scales, the right pupil-teacher ratios, good students would just pop out of our schools. It's time to turn things around -- to focus on students, to set standards for our schools -- and let teachers and principals figure out how best to meet them.

We've made a good beginning by setting the nation's sights on six ambitious National Education Goals -- and setting for our target the year 2000. Our goals have been forged in partnership with the nation's governors, several of whom are with us here today in the East Room. And those who have taken a leadership are well-known to everyone in this room. And for those who need a refresher course -- there may be a quiz later on -- let me list those goals right now.

By 2000, we've got to, first, ensure that every child starts school ready to learn; second one, raise the high school graduation rate to 90 percent; the third one, ensure that each American student leaving the 4th, 8th and 12th grades can demonstrate competence in core subjects; four, make our students first in the world in math and science achievements; fifth, ensure that every American adult is literate and has the skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship; and sixth, liberate every American school from drugs and violence so that schools encourage learning.

Our strategy to meet these noble national goals is founded in common sense and common values. It's ambitious and, yet, with hard work, it's within our reach. And I can outline our strategy in one paragraph, and here it is:

For today's students, we must make existing schools better and more accountable. For tomorrow's students, the next

generation, we must create a new generation of American schools. For all of us, for the adults who think our school days are over, we've got to become a nation of students -- recognize learning is a lifelong process. Finally, outside our schools we must cultivate communities where learning can happen. That's our strategy.

People who want Washington to solve our educational problems are missing the point. We can lend appropriate help through such programs as Head Start. But what happens here in Washington won't matter half as much as what happens in each school, each local community and, yes, in each home. Still, the federal government will serve as a catalyst for change in several important ways.

Working closely with the governors, we will define new World Class Standards for schools, teachers and students in the five core subjects: math and science, English, history and geography.

We will develop voluntary -- let me repeat it -- we will develop voluntary national tests for 4th, 8th and 12th graders in the five core subjects. These American Achievement Tests will tell parents and educators, politicians and employers, just how well our schools are doing. I'm determined to have the first of these tests for 4th graders in place by the time that school starts in September of 1993. And for high school seniors, let's add another incentive -- a distinction sure to attract attention of colleges and companies in every community across the country -- a Presidential Citation to students who excel on the 12th grade test.

We can encourage educational excellence by encouraging parental choice. The concept of choice draws its fundamental strength from the principle at the very heart of the democratic idea. Every adult American has the right to vote, the right to decide where to work, where to live. It's time parents were free to choose the schools that their children attend. This approach will create the competitive climate that stimulates excellence in our private and parochial schools as well.

But the centerpiece of our National Education Strategy is not a program, it's not a test. It's a new challenge: To reinvent American education -- to design New American Schools for the year 2000 and beyond.

The idea is simple but powerful: Put America's special genius for invention to work for America's schools. I will challenge communities to become what we will call America 2000 communities. Governors will honor communities with this designation if the communities embrace the national education goals, create local strategies for reaching these goals, devise report cards for measuring progress, and agree to encourage and support one of the new generation of America's schools.

We must also foster educational innovation. I'm delighted to announce today that America's business leaders, under the chairmanship of Paul O'Neill, will create the New American Schools Development Corporation -- a private sector research and development fund of at least \$150 million to generate innovation in education.

This fund offers and open-end challenge to the dreamers and the doers eager to reinvent -- eager to reinvigorate our schools. With the results of this R&D in hand, I will urge Congress to provide \$1 million in start-up funds for each of the 535 New American Schools -- at least one in every congressional district -- and have them up and running by 1996.

The New American Schools must be more than rooms full of children seated at computers. If we mean to prepare our children for life, classrooms also must cultivate values and good character; give real meaning to right and wrong.

We ask only two things of these architects of our New American schools: that their students meet the new national

standards for the five core subjects, and that outside of the costs of the initial research and development, the schools operate on a budget comparable to conventional schools. The architects of the New American Schools should break the mold. Build for the next century. Reinvent -- literally start from scratch and reinvent the American school. No question should be off limits, no answers automatically assumed. We're not after one single solution for every school. We're interested in finding every way to make schools better.

There's a special place in inventing the New American School for the corporate community, for business and labor. And I invite you to work with us not simply to transform our schools, but to transform every American adult into a student.

Fortunately, we have a secret weapon in America's system of colleges and universities -- the finest in the entire world. The corporate community can take the lead by creating a voluntary private system of world-class standards for the workplace. Employers should set up skill centers where workers can seek advice and learn new schools. But most importantly, every company and every labor union must bring the worker into the classroom and bring the classroom into the workplace.

We'll encourage every federal agency to do the same. And to prove no one's ever too old to learn, Lamar, with his indefatigable determination and leadership, has convinced me to become a student again myself. Starting next week, I'll begin studying. And I want to know how to operate a computer. (Laughter.) Very candidly -- (applause) -- I don't expect this new tutorial to teach me how to set the clock on the VCR or anything complicated. (Laughter.) But I want to be computer literate, and I'm not. There's a lot of kids, thank God, that are. And I want to learn, and I will.

The workplace isn't the only place we must improve opportunities for education. Across this nation, we must cultivate communities where children can learn. Communities where the school is more than a refuge, more than a solitary island of calm amid chaos. Where the school is the living center of a community where people care -- people care for each other and their futures. Not just in the school but in the neighborhood. Not just in the classroom, but in the home.

Our challenge amounts to nothing less than a revolution in American education. A battle for our future. And now, I ask all Americans to be points of light in the crusade that counts the most: the crusade to prepare our children and ourselves for the exciting future that looms ahead.

What I've spoken about this afternoon are the broad strokes of this National Education Strategy. Accountable schools for today, a new generation of schools for tomorrow. A nation of students committed to a lifetime of learning and communities where all our children can learn.

There are four people here today who symbolize each element of this strategy and point the way forward for our reforms. Esteban Pagan -- Steve -- an award-winning 8th grade student in science and history at East Harlem Tech, a choice school. Steve? Right here, I think. Stand up, now. (Applause.)

Mike Hopkins. "Lead Teacher" in the Saturn School in St. Paul, Minnesota, where teachers have already helped reinvent the American school. Mike, where are you? Right here, sir. Thank you. (Applause.)

David Kelley. A high-tech troubleshooter at the Michelin Tire plant in Greenville, South Carolina. David has spent the equivalent of one full year of his four years at Michelin back at his college expanding his skills. David? There he is. (Applause.)

Finally, Michelle Moore, of Missouri. A single mother,

active in Missouri's Parents as Teachers program. She wants her year-old son, Alston, to arrive for his first day of school ready to learn. Michelle? (Applause.)

So, to sum it up, for these four people and for all the others like them, the revolution in American education has already begun. Now I ask all Americans to be points of light in the crusade that counts the most: the crusade to prepare our children and ourselves for the exciting future that looms ahead. At any moment in every mind, the miracle of learning beckons us all.

Between now and the year 2000 there is not one moment or one miracle to waste.

Thank you all. Thank you for your interest, for your dedication. And may God bless the United States of America. Thank you very much. (Applause.)

END

2:24 P.M. EDT

THE WHITE HOUSE
Office of the Press Secretary

EMBARGOED FOR RELEASE
UNTIL 2:00 P.M. EDT
APRIL 18, 1991

AMERICA 2000: THE PRESIDENT'S EDUCATION STRATEGY
FACT SHEET

The President today outlined his strategy to move the Nation toward achieving the national education goals and educational excellence for all Americans. The President believes we must restructure and revitalize America's education system by the year 2000.

Emphasizing that this effort is a national challenge, the President asked all Americans to take part in "the crusade that counts most -- the crusade to prepare our children and ourselves for the exciting future that looms ahead."

AMERICA 2000 builds on four related themes:

- Creating better and more accountable schools for today's students;
- Creating a New Generation of American Schools for tomorrow's students;
- Transforming America into a Nation of Students; and
- Making our communities places where learning will happen.

**I. CREATING BETTER AND MORE ACCOUNTABLE SCHOOLS
FOR TODAY'S STUDENTS**

The President called on all Americans to help create better and more accountable schools based on world class standards and the principle of accountability. He encouraged all elements of our communities -- families, businesses, unions, places of worship, neighborhood organizations and other voluntary associations -- to work together with our schools to help the Nation achieve educational excellence.

A. World Class Standards in Five Core Subjects

The President believes the time has come to establish world class standards for what our children should know and be able to do in five core subjects: English, mathematics, science, history, and geography.

- Through the National Education Goals Panel, and working with interested parties throughout the Nation, the President and the Governors will develop a timetable for establishing national standards in these five subjects, and in September 1991, and each year thereafter, the panel will report to the Nation on progress toward the national education goals.
- The standards are intended to lift the entire education system and improve the learning achievement of all students. The President and the Governors oppose a national curriculum or federalizing our education system.

B. A System of Voluntary National Examinations

Through the efforts of the National Education Goals Panel, a system of voluntary examinations will be developed and made available for all fourth, eighth, and twelfth grade students in the five core subjects.

- These American Achievement Tests will challenge all students to strive to meet the world class standards and ensure that, when they leave school, students are prepared for further study and the workforce. The tests will measure higher order skills (i.e., they will not be strictly multiple choice tests).
- The President, working with the Nation's Governors, will seek Congressional authorization for State-level National Assessment of Educational Progress assessments and for optional use of these assessments at district and school levels.
- Students who distinguish themselves on the American Achievement Tests will receive a Presidential Citation for Educational Excellence in recognition of their outstanding achievement.
- The President will seek authorization for Presidential Achievement Scholarships to reward academic excellence among low income students pursuing postsecondary education opportunities. These financial awards will be based on superior high school and college performance.

C. Schools as the Site of Reform

The Administration will help strengthen the capacity of elementary and secondary schools to improve results and to innovate by increasing flexibility in decisionmaking at the State, district, and school levels and encouraging report cards on performance.

- In addition to an annual National Report Card, the President will encourage schools, school districts, and States to issue regular report cards on their education performance. These report cards will measure results and progress toward achieving the national education goals.
- As part of his AMERICA 2000 Excellence in Education Act of 1991, the President will again seek legislation that will allow greater flexibility in the use of Federal resources for education in exchange for enhanced accountability for results.
- To stimulate reform in mathematics and science education, the AMERICA 2000 Excellence in Education Act of 1991 will include \$40 million for new grants to school districts that show significant gains in student achievement. Awards will be used for continued improvements in these vital subjects.
- The AMERICA 2000 Excellence in Education Act of 1991 also will seek funds for a Merit Schools Program for States to award individual schools that demonstrate significant progress toward the national education goals. States may "bank" funds over several years to create even more incentives for successful schools.

D. Providing and Promoting School Choice

The President believes that educational choice for parents and students is critical to improving our schools.

- The President will promote State and local choice programs as part of his AMERICA 2000 Excellence in Education Act of 1991.
 - A \$200 million Education Certificate Program Support Fund will provide incentive grants to local school districts with qualified education certificate programs that enhance parental choice.
 - National school choice demonstration projects will be supported through a \$30 million initiative.
- The Administration also will seek ways to ensure that Federal education programs are more supportive of choice.

E. Teachers and Principals

America's teachers and principals are on the front lines of transforming our schools. As part of his AMERICA 2000 Excellence in Education Act of 1991, the President will propose several initiatives to promote outstanding leadership in our schools.

- Presidential Awards for Excellence in Education will recognize and reward outstanding teachers across America.
- The President will encourage States and communities to provide alternative routes of certification through one-time grants to States to support implementation of alternative certification.
- In order to improve the training of school principals and other school leaders, the President will propose establishing Governors' Academies in every State with Federal seed money to enhance principal training through instructional and mentoring programs.
- The President will seek to establish Governors' Academies for America's teachers with Federal seed money to offer advanced instruction focusing on the five core academic disciplines.

The President also encouraged States to consider differential pay and financial and other awards for those who excel in teaching, teach core subjects, teach in challenging settings, and serve as mentors for new teachers.

II. CREATING A NEW GENERATION OF AMERICAN SCHOOLS FOR TOMORROW'S STUDENTS

The President today challenged the best minds in America to design -- and help communities create -- the best schools in the world.

A. Research and Development

A series of Research and Development Teams, funded by contributions from the business community, will help design a New Generation of American Schools.

- America's business leaders will establish and mobilize private resources for the New American Schools Development Corporation, a new non-profit organization that will award contracts in 1992 to between three and seven Research and Development Teams. These teams may consist of

corporations, universities, think tanks, school innovators and others. The teams' products will be available to the American people.

- The mission of these teams is to help communities create schools that will reach the national education goals, including world class standards in the five core subjects for all students, as monitored by the American Achievement Tests and similar measures.
- The President will ask his Education Policy Advisory Committee, as well as the Department of Education, to examine the work of these Research and Development Teams and to report on their progress.

B. New American Schools

The President will ask Congress to provide \$550 million in one-time start-up funds to create at least 535 New American Schools that "break the mold" of existing school designs.

- These funds will provide up to \$1 million for each New American School to underwrite special staff training, instructional materials, or other support the school needs. The goal is to have at least one New American School operating in each Congressional district by September 1996.
- Once the schools are launched, the operating costs of the New American Schools will be no more than those of conventional schools.
- The President also will ask Congress for start-up funds to help design state-of-the-art technology appropriate for New American Schools.
- A New American School does not necessarily mean new bricks-and-mortar. Nor does a New American School have to rely on technology; the quality of learning is what matters.

C. AMERICA 2000 Communities

The President called on every community in the country to do four things:

- Adopt the six national education goals;
- Establish a community-wide strategy for achieving the goals;
- Develop a report card for measuring its progress; and
- Demonstrate its readiness to create and support a New American School.

Communities that accept this challenge will be designated, by the Governors of their States, as "AMERICA 2000 Communities."

- Governors, in conjunction with the Secretary of Education, will review community-developed plans with the assistance of a distinguished advisory panel and will determine which AMERICA 2000 Communities in each State will receive Federal financial support in starting New American Schools.
- The Governors and the Secretary will ensure that many such schools serve communities with high concentrations of children at risk.

D. Leadership at All Levels

Transforming American education and creating a New Generation of American Schools will **require** the commitment of America's leaders at all levels.

- The President welcomes the commitment by American business to contribute \$150-\$200 million to support the Research and Development effort.
- The President asked the Nation's Governors to lead the New American Schools effort in their States.
- The President challenged State legislatures to: support the creation and operation of New American Schools; embrace the world class standards and adopt the American Achievement Tests; and work toward school, district, and State-level report cards.
- The President encouraged civic leaders to help organize community plans all across the country to seek designation as an AMERICA 2000 Community, and to help plan and operate New American Schools. Business can encourage local schools to use the world class standards and American Achievement Tests, and encourage schools to issue report cards on their performance.
- The President called on educators to accept new roles and to take risks. Teachers, principals, and other educators are asked to work to develop a consensus on the world class standards and to determine what it would take to create a New American School in each community.

E. Families and Children Devoted to Learning

The President called on parents to urge use of world class standards, American Achievement Tests, and report cards by local schools. Parents must play a key

role in creating New American Schools in their own communities and must work with children in the home to improve children's performance in school.

III. TRANSFORMING AMERICA INTO "A NATION OF STUDENTS"

The President believes that learning is a life-long challenge. Approximately 85 percent of America's workers for the year 2000 are already in the workforce. Improving schools for today's and tomorrow's students is not sufficient to ensure a competitive America in the year 2000. The President called on Americans to move from "A Nation at Risk" to "A Nation of Students" by continuing to enhance the knowledge and skills of all Americans.

A. Strengthening the Nation's Education Effort for Yesterday's Students, Today's Workers

To advance the goal of improving literacy for all Americans:

- The President will push for greater accountability and choice in the Adult Education Act, and will advance these twin principles in new adult literacy activities proposed under the new AMERICA 2000 Excellence in Education Act of 1991.
- The Department of Education will provide regular, timely, and reliable information by expanding the National Adult Literacy Survey and collecting information about literacy efforts on a regular basis.

B. Establishing Standards for Job Skills and Knowledge

The President urged business and labor cooperatively to develop -- and then to use -- world class standards and core proficiencies for each industry. Federal resources will be sought to provide start-up assistance for this effort.

C. Creating Business and Community Skill Clinics

Today's workers will be assisted through Skill Clinics -- one-stop service centers located in businesses and communities across America where adults can get job skill diagnosis and referral services.

- The Administration will urge businesses to make Skill Clinics available to their employees and encourage AMERICA 2000 Communities to establish community Skill Clinics.

- Federal departments and agencies will be encouraged to establish such Skill Clinics and, working with the Office of Personnel Management, will be encouraged to undertake activities to upgrade their employees' skills.

D. Enhancing Job Training Opportunities

The Domestic Policy Council Job Training 2000 Working Group will review current Federal job training efforts and identify successful ways of motivating and enabling individuals to receive the comprehensive services, education, and skills necessary to achieve economic independence.

E. Mobilizing A "Nation of Students"

The President will work to transform "A Nation at Risk" into "A Nation of Students."

- The President called on the Secretary of Education and the Secretary of Labor to convene business and labor leaders, education and training experts, and Federal, State, and local government officials at a national conference on the education of adult Americans to launch a national effort to transform adult America into a "Nation of Students."

IV. MAKING OUR COMMUNITIES PLACES WHERE LEARNING WILL HAPPEN

The President called on communities to adopt the six national education goals as their own; set a community strategy to meet them; produce a report card to measure results; and agree to create and support a New American School.

The President believes that it is essential to reaffirm such enduring values as personal responsibility, individual action, and other core principles that must underpin life in a democratic society. The aim of the AMERICA 2000 Community campaign is to make our communities places where learning will happen.

A. Greater Parental Involvement

The President urged parents to become more involved in their children's education and in the work of the New American Schools.

- Parents and teachers should encourage children to study more, learn more, and strive to meet higher academic standards.
- The President encouraged parents to read aloud daily to their children, especially their younger children.

B. Enhanced Program Effectiveness for Children and Communities

The President is committed to making government work better to improve programs for America's children and communities.

- Working through the Domestic Policy Council Economic Empowerment Task Force and with the Nation's Governors and other officials, the Administration will undertake better coordination of existing Federal programs with corresponding State and local activities.
- As part of this effort, existing program eligibility requirements will be reviewed in order to streamline them and reduce Federal red tape. Wherever possible, States will be afforded maximum flexibility to design and implement integrated State, local, and Federal programming.

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9121207

FROM: MAC LANE, Saunders

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 04/17/91

SUBJECT: RE: THE ACADEMIC EMPLOYMENT FOR NEW Ph.D.S IN
MATHEMATICS

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: 04/22/91

FILE: EDUCATION

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RECEIVED

91 APR 22 P 1: 49

OFFICE OF THE
DIRECTOR

April 17, 1991

Dr. Allen Bromley
The White House
Washington, D.C. 20500

Dear Allen,

As you doubtless know, the academic employment for new Ph.D.s in Mathematics is very bad this year (as stated in the enclosed recent article from the Notices of the American Mathematical Society, written by Don Lewis (Michigan)).

I might add one comparison: The situation now is as bad as that at the depths of the depression! In 1934 I was finishing a Postdoc at Yale and trying to find an academic job. I was lucky; almost none of my then colleagues were.

If you are at the Academy meeting April 28-30, I might hope that we could chat briefly about the situation.

Cordially,


Saunders Mac Lane

SM/lw

Forum

April 1991

The Forum section publishes short articles on issues that are of interest to the mathematical community. Articles should be between 1000 and 2500 words long. Readers are invited to submit articles for possible inclusion in Forum to:

Notices Forum Editor
American Mathematical Society
P.O. Box 6248
Providence, RI 02940

or electronically to notices@math.ams.com

Employment of New Ph.D.s: Some Proposals*

D. J. Lewis

University of Michigan

Recent discussions within the mathematical community have focused on postdoctoral appointments and the recruitment process in mathematics. After reviewing the current situation, I will make some suggestions whose implementation would, I believe, alleviate some of the problems that have plagued the recruitment process in recent years and enhance the development of young mathematicians. I hope these suggestions will catalyze further discussion and action.

Current Problems and Needs

Job market. If last year's job market for new Ph.D.s was difficult, then this year's promises to be a calamity. Last year, most new Ph.D.s eventually were employed, if only in one-year positions. This year, however, I expect a large number to be unable to find positions or to have to settle for low paying adjunct positions, an abomination used by some institutions to keep costs down. With all but two or three states running deficits, many state universities have had to take mid-year reductions of 5-10% in their state support—reductions that certainly will not be made up in 1991-1992 and that are too large to be covered by tuition increases. Those lucky enough to escape mid-year reductions are expecting no increase for 1991-1992 even in the face of 5% inflation.

*"This piece grew out of remarks presented during a panel discussion, 'The employment process: Can we do better?', held during the Joint Mathematics Meetings in San Francisco in January 1991. The panel was sponsored by the AMS-MAA Committee on Employment and Educational Policy."

The situation is no better at the private institutions. Last year, because of the drop in the number of eighteen year olds, many liberal arts colleges were unable to meet their enrollment goals and this year they expect more difficulty. The private research universities are experiencing a revolt against the size of their tuitions and will need to cut back. Industry cannot be expected to pick up the slack in academic hiring, for it has made large reductions in white collar positions.

With the strong possibility of unemployed Ph.D.s, we may find that, as in the late 1970s, there will be a decrease in the number of young Americans pursuing mathematical studies. Demographic projections show a rising number of eighteen year olds and increasing faculty retirements, which some say will cause a shortage of mathematics faculty as early as 1995, reaching a crescendo in 2005. (This problem is not just with mathematics; indeed, it is probably more acute in physics and some areas of engineering.) If those predictions prove correct, we must find a way to sustain a substantial number of new Ph.D.s until the job market responds to the projections and the fiscal situation improves.

Number of applicants. For some years now, departments have been deluged with applications. Postdoctoral programs typically draw in excess of 400 applications. A tenure-track advertisement, even when the field is narrowly defined, will attract 300 applications, and most do not meet the stated criteria. Some mathematics departments have received over 1000 applications this year, and departments have had to add staff just to handle the paper flow from applicants.

Applications these days are much like junk mail: mass produced, often unsolicited, with no focus on the employers' needs. Few applicants seem to have given any thought to where or why they are submitting an application. Ph.D. advisors give no direction or counsel.

Under the duress of writing to so many institutions, referees write generic letters covering every possible type of institution; some are so generic only the name of the applicant needs to be changed. The letters are sent by a secretary on the applicant's request to as many as two hundred schools. Freedom of information laws have led to letters that make one think they are selling soap rather than describing creative human beings with individual strengths and weaknesses.

With so many applications to screen and with reference letters so undiscerning, everything becomes a blur to the hiring panels, and I am sure many worthy candidates are overlooked. I expect that, without intending to, the panels are now more than ever falling back on the "old boys' network" because it is the only way to make sense out of 400 application folders that all read like soap ads. We have opened up the job market, but the system has become overloaded because applicants lack realistic judgement of their merits and advisors are not providing it.

More postdoctorates? More and more universities are restricting their candidate pool for tenure-track positions to those who have completed a postdoctorate. I expect they are doing so in part to limit the number of applicant folders they must read, but, more fundamentally, they find that those who have benefited from a postdoctorate are more successful in attaining tenure. Unfortunately, there are not as many individuals completing a postdoctorate as there are university tenure-track openings. I believe this mismatch accounts for the employment data showing a steadily increasing number of unfilled positions.

Most new Ph.D.s need a supportive environment to develop a strong research program. This is especially true of graduates of U.S. high schools and colleges, who arrive in graduate school two years behind their peers from other countries. In a four-, five-, or even six-year graduate program (especially one in which the students must do a great deal of teaching) one usually has to settle for a much narrower education than is desirable and for a first research paper based on a problem posed by the thesis advisor. Such graduates need more time to develop as independent researchers. They need the maturation that comes from being part of a well-run postdoctoral program, and the market is demanding more individuals with such experience.

Other countries, by having a two-tiered doctorate or by docent programs, have the equivalent of a postgraduate program. In the laboratory sciences, 40-50% of the new Ph.D.s, in particular, all those planning careers in academic research, participate in postdoctoral programs. U.S. mathematicians have been slow to see the need for a substantial postdoctoral program. Moreover, in contrast to other fields, the majority of postdoctorates in mathematics are university funded.

At the University of Michigan, we view our postdoctoral program as a continuation of our educational mission. The program gives the postdoctorates the time and the opportunity to develop and enhance their research programs. We work with our postdoctorates to improve their teaching, we help them in making grant proposals, and we hope by example to give them an understanding of the professional standards and ethical behavior expected of a mathematician-educator.

We need to find a way to increase the number of mathematics postdoctorate slots. The few mathematics research institutes are filled to capacity; moreover, they usually only provide one-year appointments and don't provide teaching experience. I believe that, even if money were available, rather than build more research institutes, we should increase

the number of university-based postdoctorates.

Proposals

Rationalizing the recruiting process. I propose that for university postdoctoral positions and those fellowships of at least two-year duration provided by the National Science Foundation (NSF), the Institute for Advanced Study, and Courant Institute, the AMS conduct a matching program as is done in medicine for hospital internships. Each applicant could rank ten or fifteen institutions. Needing to write only a few letters, the referees would hopefully be willing to address why X would benefit from a stay at Y. Each institution would then consider those applicants who had listed it and would choose a preferred list—not necessarily linear, but a limited branch tree. A computer matching would then attempt a best fit, to be completed by February 15. Those not selected would then enter the market for other positions.

This matching method would not only reduce the overload on the research universities, but also on other institutions. Moreover, it would shorten the recruitment season and the stress on applicants. Nowadays, many new doctorates will not consider other offers until the postdoctoral competition is over. If they are listed as an alternate for a postdoctoral position in one department, they may wait to see if that department gets a rejection before they will accept an offer from another department. These delaying tactics mean that the non-research universities cannot begin making offers until mid-March, often April.

New postdoctoral positions. Few if any research universities are financially able to add new lines for postdoctoral positions, although they may be able to do some shifting of funds to add one or two positions. The David I report led to a modest increase in NSF-funded postdoctorates and we should use David II to campaign for a more substantial increase. But I am doubtful that in the near future government agencies will put more money in this direction. The only alternative, then, is to press for a different allocation of funds. The NSF has a policy of providing summer support for a substantial number of recent math Ph.D.s. More than likely, the ones receiving this support are the ones on university-based postdoctorates. Why not use these funds for academic-year released time, thereby providing additional postdoctorates at universities?

Emergency measure. As a short-term measure to partially compensate for the hiring freezes, I propose that all government funding agencies tax all grant salaries 5% and use these funds to create emergency two-year postdoctorates for about 20% of U.S. citizens completing the Ph.D. in the sciences, engineering, and mathematics. The job squeeze is in all scientific fields, so the tax should apply to all of them. The stipend should be held under \$24,000 per twelve months, including health benefits. I would not aim to do more, for I expect we will need to repeat this emergency measure a second year. Such a response will not mean that all seeking positions will find one, but it will salvage the best and it would send a message to the young that the scientific establishment cares.

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9121133

FROM: GASQUE, Betty

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 04/12/91

SUBJECT: THE NEED TO STRENGTHEN THE FOCUS ON TECHNOLOGY IN
EDUCATION TO REMAIN ECONOMICALLY COMPETITIVE.

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: 04/16/91

FILE: EDUCATION



STILL LIFE: FLOWERS AND FRUIT

Detail from a painting by Severin Roesen,

German, active in America 1848–1872

Oil on canvas, ca. 1850–55

THE METROPOLITAN MUSEUM OF ART

Purchase, Bequest of Charles Allen Munn, by exchange,
Fosburgh Fund, Inc., and Mr. and Mrs. J. William Middendorf II Gifts,
and Henry G. Keasbey Bequest, 1967 67.111

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that there will be
a strong focus on
technology. As a teacher
in a rural area

of South Carolina, I
am concerned that all
students may not have
equal access to technology.
We certainly need to
strengthen that area to
remain economically
competitive.

Thank you again for
your support and interest.

Sincerely,
Betty Hoagne

4-12-91

Dear Dr. Bromley,

I enjoyed your remarks
very much last fall at
the Presidential Awards
Lanquet and awards
presentation ceremony.
It was kind of you to
take so much time
from your busy schedule
to be with us.

I am glad to read
that the President will
soon be introducing
new educational
initiatives. I hope



Dr. D. Allan Bromley
Assistant to the President
for Science and Technology
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91 APR 22:34

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