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LECTURE-DEMONSTRATION-DISCUSSION

on

**"LASER THERAPEUTICS"
FOR "PREGNANCY & BIRTH CONTROL!"
"THE AQUARIAN NUCLEAR AGE**

OF

ASTRO-PHYSICS"

**THE ATOMIC NUCLEAR STRUCTURE OF THE COSMOS
SOLAR NUCLEAR CIRCADIAN AND
LUNAR BIOLOGICAL TIDAL RHYTHMS!**

AND

**FOOD/FAT/PROTEIN HAVE NO ELECTRIC ENERGY!
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and

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CHAPTER 6

PHYSIOLOGICAL AND BEHAVIORAL EFFECTS IN HUMANS

Organisms exposed to ELF electric or magnetic fields may respond with a change in physiological function or behavioral activity. The effects which have been investigated range from electric field-conditioned behavior in fish to effects on biological rhythms in man and include many other effects in man, mammals, birds, amphibians, insects, molds and even bacteria. This diversity in the areas of investigation is complemented by a wide variety in the form of the fields used in these studies. Both AC and DC electric and/or magnetic fields are used at field strengths which vary from the low values typical of the natural environment to values so large they can be found only in specialized laboratory situations.

In the first sections we discuss the reports of studies performed with human subjects.

6.1 PERCEPTION OF LOW LEVEL ELECTRIC AND MAGNETIC FIELDS

Mamor, 1969

Measurements of small changes in reaction times were used to demonstrate sensitivity to horizontal electric fields at frequencies of 12, 6 and 2 Hz. Twenty-seven subjects were exposed to 4 v/m electric fields created by a pair of vertical metal plates.

Reaction times were measured by response to a 1 kHz audio signal. Twenty-four measurements were taken in 11 minutes during the twice-daily test sessions, which lasted a total 16 minutes each, because the fields were on for 5 minutes before measurement was begun. The dual sessions were repeated for 15 days, in which no external fields were applied on the first 5 days and, on the last 10 days, a 4 v/m field was applied for 16 minutes at one frequency and then, after a rest, 16 minutes at another frequency. It was observed that under the influence of the higher of the two frequencies, reaction times were slowed by an average of 1.6 milliseconds (standard error, 0.6 milliseconds). This result was found when either 12 and 6 Hz or 6 and 2 Hz was used as the pair of test frequencies. Over the course of the 10-day exposure to the fields, there was a steady 5 millisecond increase in the reaction times. In addition, the data show a sharp, 6 millisecond increase in the reaction time coincident with energizing the field on Day 6.

The conclusion that reaction times are increased at the higher frequencies is said to be supported at the 95% level of confidence, although the data analysis is difficult to follow. On the basis of this pilot quality study, it appears that human reaction times may be sensitive to external electric fields in the frequency RANGE 2-12 HZ AND THAT THERE MAY BE THE ABILITY TO DISCRIMINATE BETWEEN FREQUENCIES IN THIS RANGE.

BIOLOGICAL EFFECTS OF ELECTRIC AND MAGNETIC FIELDS OF

EXTREMELY LOW FREQUENCY

ALSO PUBLISHED BY TECHNOLOGY INFORMATION CENTER U.S. DEPT. OF ENERGY 1999

Asher R. Sheppard, Ph.D. Merrill Eisenbud, Sc.D.

Institute of Environmental Medicine New York University Medical Center

BIOLOGICAL EFFECTS OF ELECTRO/MAGNETIC RADIATION 1983

Behavioral alterations have been reported in experiments on several species. In man, the daily biological cycle in body temperature, activity, and urinary electrolyte levels (circadian rhythm) was significantly shorter when the subjects were influenced by a small (2.5 v/m), 10 Hz, square wave electric field (Meyer, 1967, 1968; 1974). Data from 10 subjects showed an average change of about 1 hour. The 10 Hz frequency was chosen for its similarity to the brain's alpha rhythm and because it is a natural component of the geo-electric field. This careful experiment has not been repeated at higher frequencies or using a sinusoidal wave. The results for exposure to a DC electric

"Alpha/Theta/Delta Brain Waves negate Free Will! "Faint!"

"ALPHAGENICS - LASER THERAPEUTICS" (C)

THEORY AND TERMINOLOGY BEHIND THIS NEW PSYCHOTECHNOLOGY.

Scientists have learned more about the human brain in the last decade than in all of previous history, and the implications of the latest research are clear: The human brain is far more powerful, and has the potential for immensely greater growth and transformation, than ever before imagined. These discoveries may constitute the most significant development in learning since the invention of writing.

What Are Brain Waves?

The brain produces a variety of simultaneous electrical signals that are called brain waves. The EEG (Electroencephalogram) is a method of measuring these minute electrical impulses. Brain waves are measured by their frequency in cycles per second or hertz (HZ). These signals vary in both frequency and strength (amplitude). It is usually the frequency that tells us most about what is going on in the brain and many studies have correlated states of mind with certain brain wave frequencies. At any given time our brains are producing a number of different frequencies ranging from 1 cycle to 30 cycles per second with a single frequency range being dominant. Scientists have grouped brain waves into four main types according to their frequency range. They are:

- Beta Waves (14-30 Hz.) associated with normal, externally-directed, awake consciousness.
- Alpha Waves (8-13 Hz.) associated with deep relaxation and daydreaming.
- Theta Waves (4-7 Hz.) accompany vivid imagery, deep meditation and facilitate memory & learning
- Delta Waves (1-3 Hz.) produced during deep sleep, profound meditation and in early childhood.

What is Entrainment?

Entrainment is a phenomenon in which powerful rhythmic vibrations from one source will cause less powerful vibrations from another source to lock in step and "entrain" with the more powerful energy. Within our bodies, the relationships among our heart rate, respiration and brain waves show aspects of this entrainment phenomenon. For example, it is possible to slow down our heart rates and brain waves by slowing our breathing. It is also possible to slow our breathing and heart rates by slowing our brain waves. The Innervision system entrains your brain by using flashing lights and pulsating sounds as the source stimulating your senses at a frequency the brain then follows.

What Is Brain Synchronization?

Neurologists have found that the brain hemispheres normally operate in different rhythms and shift dominance back and forth depending on the task at hand. However, during certain states such as deep meditation, creativity, and spiritual/religious experiences, the two hemispheres are synchronized or working in unison. In addition, during synchronization the brain is generally in an alpha or theta wave state. This is the state in which a person is most receptive to subliminal messages, guided meditation and hypnosis.

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MIND

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WHERE BRAIN AND ELECTRONICS MEET
may arise the ultimate thinking
machine, the brainstorming computer

A CONCENTRATION OF QUANTUM WAVES! F.R.B. (OSCILLATIONS)

A mouse sniffs around a lab late at night, while an exhausted researcher slumbers over a supercomputer terminal. Although neither can tell us what's going through his mind, both brains are putting out waves, a quietly reverberating electrical storm that present-day computers can't duplicate.

Unless the scientist is Roger Traub: His computer might be giving off waves, too.

To Traub's astonishment, his computer started doing just that last year. Traub devised a program that re-created a 9,900-cell slice of brain circuitry, an anatomically accurate network. When fed simulated sensory input, the brain-slice program responded with a series of artificial theta waves. "It was completely spontaneous," remembers Traub, a neurologist and research fellow at IBM's Thomas J. Watson Research Center in Yorktown Heights, New York.

For years, computer scientists in the neural network field have striven to design machines that can think like brains. But no one knows how brains do it. Brain-scanning tools only measure the collective voltage of millions of firing neurons. Some neurons send excitatory, others inhibitory messages. Both types are interlaced in a labyrinth of connections and feedback. Traub's program is a big step toward mapping this electrical traffic. It also demonstrates how far neural network computers must evolve before they can replicate brain functions.

In the early Eighties, Traub assembled his first computerized

model from experiments aimed at understanding epilepsy. At Columbia University, he and colleagues pieced together a model of excitatory connections between cells based on a statistical analysis of recordings from a slice of rat hippocampus—a hot spot of electrical activity. Ultimately, they built a model of a healthy hippocampus. When Traub delivered a sensory-type signal to one of his

how the brain seems to operate. Also, data processing in computers involves instantaneous electrical events with no aftereffects. "No part of the brain works like that," Traub says. "There are always aftercurrents that keep a record of past events." His network incorporates these after-ripples.

Traub thinks a paradigm of the brain's functioning may derive from studies of chaos. Physicists,

for example, can reduce the turbulence of airflow over a helicopter blade to mathematical values that, charted geometrically, settle into a wobbly but repeated orbit. Such a pattern is called a strange attractor. The rhythmic firings of the hippocampus, Traub suggests, may be a similar manifestation of the underlying chaotic firing of individual neurons.

"If you change the initial conditions, set up different connections and strengths of connections," he notes, "the pattern is disrupted but you still get an oscillation. And that behavior suggests a strange attractor."

A strange attractor could represent a memory, Traub speculates, and different initial conditions could lead the network to settle on different memories. "Of course it could mean nothing like that," he admits. "Maybe if you wire it up this way, the damn thing just oscillates."

Could his research lead to a new computer architecture? "When we understand the dynamics of this thing," Traub insists, "maybe we can find uses for it, but not before."

—Gregory T. Pope DO

Individual neurons seemed to fire at random. Yet as a whole, the neural network pulsed in a rhythmic oscillation, doing "the Theta Wave."



simulated neurons, the entire network settled into a low-frequency oscillation. A rhythm swept around the network; groups of cells fired in unison, then rested, almost like stadium spectators doing "The Wave."

From Traub's models comes a picture of a brain far more dynamic than suggested by current neural network computers. Computers work by channeling electrical activity into precise, insulated currents. Designers toil to avoid having one transistor generate an electrical field that touches off spontaneous activity in neighboring transistors. Yet that's exactly

LASERS IN PSYCHOTHERAPY AND METABOLIC THERAPEUTICS® "Molecules are Oscillating Nuclear Electro-Gravitational Particles"

Altered states of consciousness, also called biofeedback, are presently used to change brain wave patterns from the Beta to the Alpha and Theta. There are many electronic devices presently being used utilizing both a flashing strobe light and musical sounds. This creates a subliminal feeling of self-awareness, which in turn can produce hypnotic effects, including the feeling of pain and emotions, somnambulism, etc.

As laser beams are also a concentrated vortex of atomic radiation, as is the mind's ability to concentrate to alter brain wave patterns, the laser would be an important instrument in not only altering brain waves, but by atomic interaction, produce the therapy required as the laser oscillations could be altered to the desired wave oscillations for psychotherapeutic use. New techniques would have to be devised as to producing the desired brain wave patterns to alleviate the mental aberration. Besides brain wave activity, we need the oxygen atoms for the maintenance of life.

When somnambulism occurs, the brain is in a higher state of awareness where the metabolism is inactive and biological rhythmic oscillations do not interfere with brain activity. This modality is known as hibernation in animal creatures. In humans, it is somnambulism, where to all appearances, the physical body with its metabolic saline cell structure is impervious to pain and the sympathetic is separated from the parasympathetic, creating a feeling of self-awareness and well-being.

Circadian, biological rhythms are a fact of life. The circadian are our daylight solar energy photon radiation, while our biological rhythms are a lunar tidal energy. Jet lag, of course, is the most common, as are the female's monthly cycles. The lunar tidal action is also one of the most important functions for procreation, the full moon being the most important. Creatures also have brain wave patterns and respond to the same circadian rhythms for navigation, herd and schooling instincts, as well as all migrations..

Laser surgery for tumors, epilepsy, dyslexia, blood clots, neurons altered, etc., will usher in a new era for brain surgery without the use of opening the skull. As we know, the brain itself has no feelings until the brain waves return to the conscious Beta, therefore, this could be used in place of anesthesiology, as the EEG would be the proper indicator to brain wave activity.

Laser Metabolic Therapeutics will establish entirely new modalities for the treatment of the cancerous molecular substructures, leukemia, AIDS, viruses, diseases, drug addiction, nervous disorders, epileptic seizures, habits — all can be halted or healed. The heart itself is regulated by our brain waves; no brain waves, no heartbeat. Once atomic nuclear laser energy is accepted as a healing, rather than a death-dealing energy, humanity will be well on the way to improved mental and physical health, as well as for all environmental concerns, including electro-magnetic radiation. All molecular atomic substructures can be altered with laser technology for hormone therapy and population control. The philosophical/cosmological atomic doctrines of the early Greeks, Lucrecius/Democritus, the Chinese Ying/Yang, the dualistic Gnostics were all delving into the mind (soul) and matter, others to scientific search for the last Big Bang particle!

As my hypothesis must be validated by laser as well as computers, EEG equipment, cyclotrons, nuclear accelerators, I feel confident that in the very near future the equipment, laboratory, personnel will be made available in a University that can fund the proposal, which will be for greater psychological and medical discoveries in the future. As this is a mere scratching of the surface of nuclear kinetic oscillations in the brain structure, as well as the metabolic homeostasis. Nuclear atomic energy creates as well as destroys!

A vortex form of atomic nuclear energy that creates a point of concentration. A crystal of synthetic ruby is used to activate the photons and ions into any energetic concentrated form of radiation. This kinetic electro-gravitation particle oscillation creates a beam of energy in both the visible and infra-red regions. Gas being the best transmitter of helium and neon subatomic particle oscillation which then can be used at many different frequencies, which develops a rapid frequency adjustment of pulses which is used in industry as well as surgery, healing of body tissues. The molecular structures then are changed for either healing or destroying. The charges acting upon similar charges of the object focused on creating and destroying as does ultra sound frequencies. The same phenomenon as the concentration of the human mind. Computers are the sophisticated dot/dash of the Morse Code, but do not have the metabolic biological clock!

The cyclonic, hurricane, tsunami, water spouts, vortexes building up tremendous volumes of gravitational kinetic energies flowing in either a clockwise or counter clockwise rotation. The magnifying glass is also a vortex producing nuclear energy source. At the equator the polarity switches as to pole position, this is also a phenomenon of pole reorientation, constantly moving its magnetic field source. The planet Earth is a huge bar magnet with polarities meeting at the equator where they separate into the two hemispheric movements of wind and water. The earth's crust is also constantly moving due to its Solar core activity of vortex oscillations. Solar energies from the Sun as well as the core of planet Earth both contribute to the vortex phenomenon.

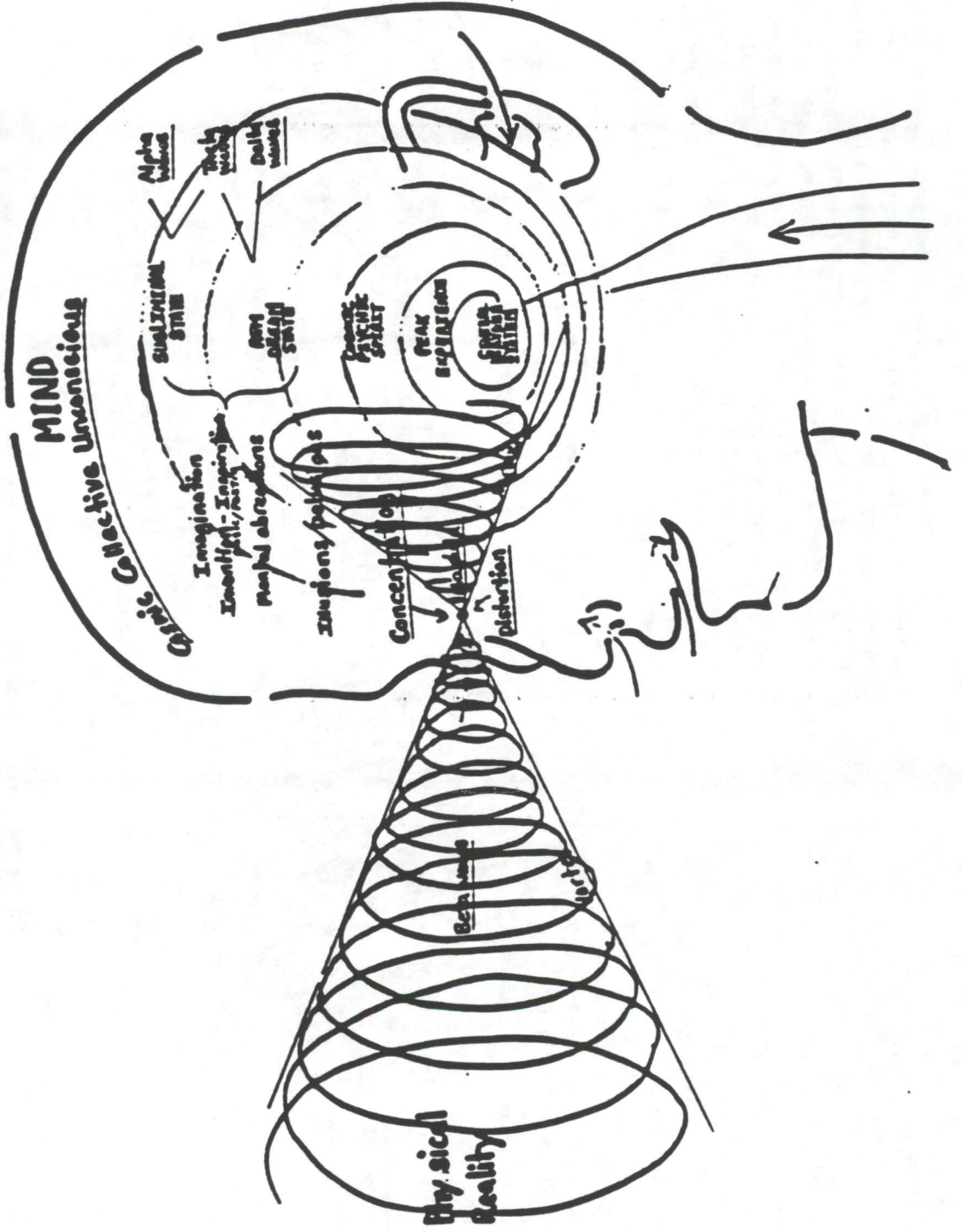
The brain with its atomic substructure of concentrated nuclear energy works on the same principle of vortex kinetic oscillating energies and is therefore amendable to laser as well as radiation and oscillating ultra-sound vibrations. A change in the molecular cell structure for brain surgery as to tumors, blood clotting, the disintegration of diseased neurons as well as the psychotherapy of the brain waves themselves for mental disorders, epilepsy, schizoid, mental derangement, emotional distress as to the activity of photon ion disorganization, electric photon kinetic energies meeting with the ionic saline solutions of the neuron can be altered with the flow of electromagnetic/gravitation kinetic oscillations, which flow in both directions, a condition of polarity that is inherent in the metabolism for equilibrium, metamorphoses of cell structures homeostasis in all animal species.

The ear canal with its rotation of fluid over sensory hairs forming loops at right angles which keeps us upright and in equilibrium with our homeostasis can also be a laser development as also the molecular structure of the larynx musculature for voice as well as goiter treatment. The nasal cavity, the oral cavity as well as the lung aveoli for oxygen increase with the blood plasma. All can be investigated or altered as cell membranes, molecules are composed of atoms and their sub atomic electro gravitational oscillations of vortex activity which can be treated with its own kinetic energies. The Chinese and the Hindu, Buddhist Egyptians explored the metabolic points of healing with herbs a natural mineral earthy product with Solar radiation, though they did not have the laser technology.

We already have eye ailments and surgery as well as foot disorders, cell tissues altered or removed at the present time. We use the laser for all types of cutting, shearing, melting, changing the atomic structures of metals, rocks, exact measurements beyond the human eyesight a beam of nuclear energy for transmission of communication is a concentrated vortex oscillating activity. Creatures, animals, insects all before humanoids have used ultra-sound oscillations for navigation finding mates, breeding, food, water by their inborn instincts to find and locate the source of their continuous sources of survival. All are earth bound made of the same earthy material as are humanoids, using the same lava, crusts oceans saline mineral solutions. Most of which have been lost with the development of the two hemisphere brain.

Even locomotion of creatures and humanoids have kinetic energy, in emergencies extraordinary speed strength decision making, all depend on the nuclear substructure for instantaneous movement. This is available at all times and all places as it is the electro/gravitation celestial solar and earth's core particle oscillations. Nuclear energy for instantaneous use by all living molecular structures. "Faith in the healing is of primary importance!"

© YOUR MIND DYNAMICS



QUANTUM
Sonic Rhythmic
Particle waves
Perturbations

OSCILLATIONS
VORTEXES
CORIOLIS FORCE

Alvin W. Fisher
1991

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 "The Cosmological Atomic Particle Connection"

OSCILLATIONS

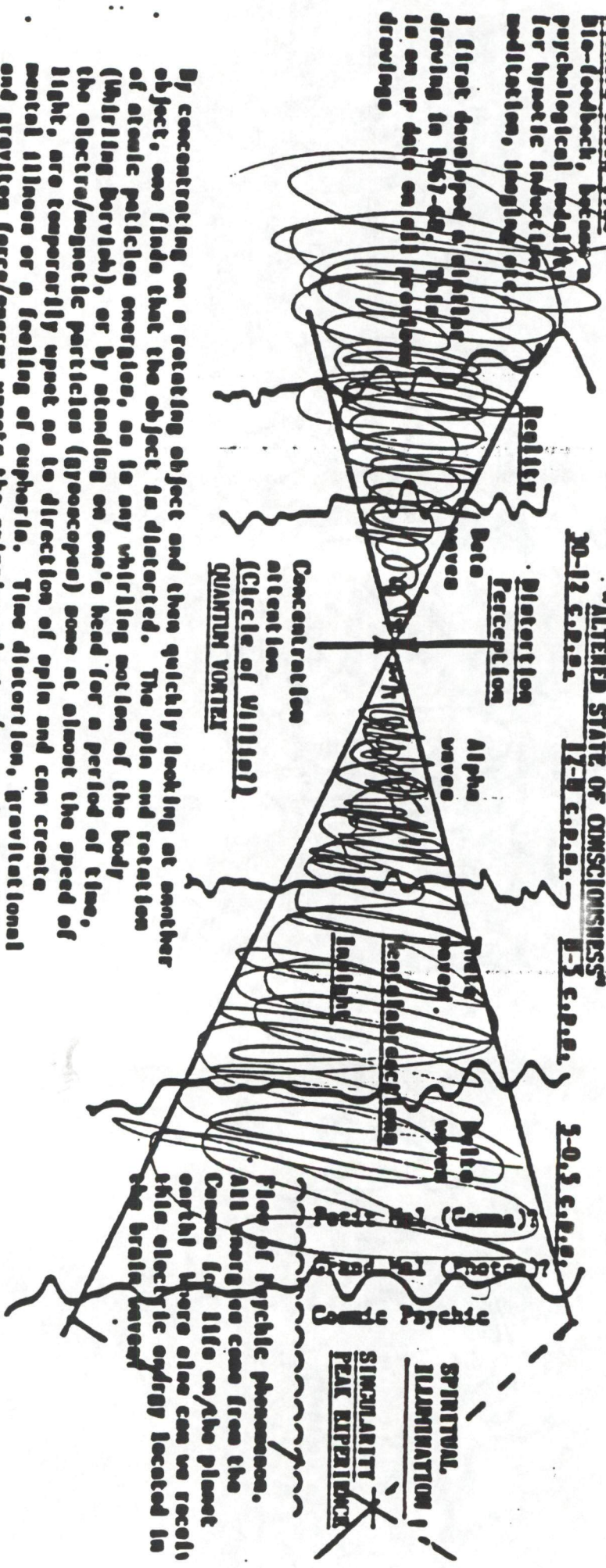
VORTEXES

CORIDIA'S ENERGY

The effortless mystical spiritual at-one-ment (peak experience) comes when all electro/magnetic atomic particles of the brain neurons (cells) are in harmonic singularity. All becomes (One), and the experience changes the personality as well as the mode of life!

Subatomic electro magnetic particles the primary source of electric energy to create the synapse and all psychic mentality.

"ALTERNED STATE OF OMNISCIENTNESS"
 20-12 C.P.P.A. 17-8 C.P.P.A. 8-3 C.P.P.A.



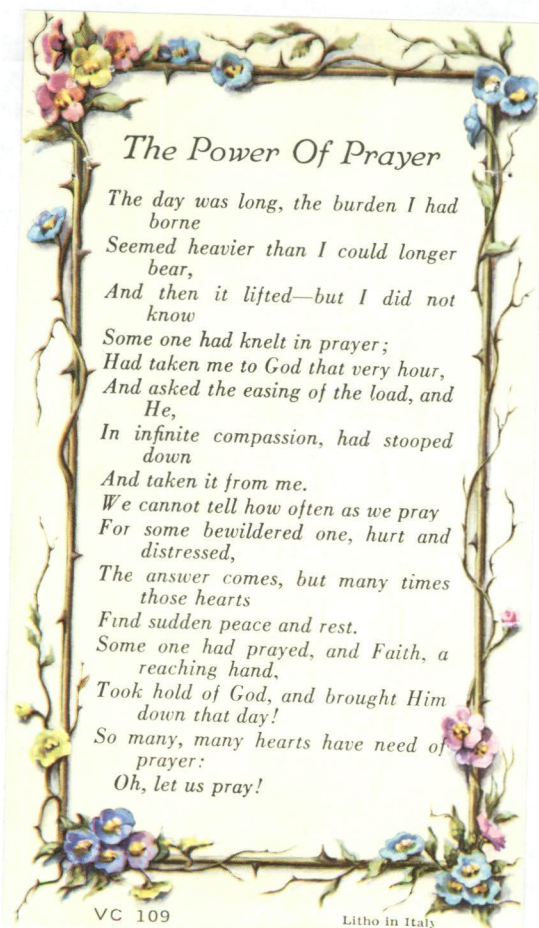
I first developed a similar drawing in 1967-68. This is an up date on all previous drawings

By concentrating on a rotating object and then quickly looking at another object, one finds that the object is distorted. The spin and rotation of atomic particles energizes, as in any whirling motion of the body (Whirling Borvish), or by standing on one's head for a period of time, the electro/magnetic particles (Gyroscope) come at almost the speed of light, are temporarily upset as to direction of spin and can create mental illness or a feeling of euphoria. Time distortion, gravitational and graviton force/energy upsets the spinning electro/magnetic particles entering the psychic mental brain neuronal. All mental neurons synapse and the various brain wave patterns have bio-electric/magnetic energies that are polarized into dream-idea-insight-thought phenomenon!

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" Blessings "
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"

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I look forward to
your keynote address
on Feb 6th.

- Dick Gerke



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Professional Issues in Engineering and Practice

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AMERICAN SOCIETY OF CIVIL ENGINEERS

ON Mac V
Wt = Fg / Ms same; still FAT!
DOCTORS LIE

NOT TRUE!

MY CA DRIVERS' PROFESSIONAL ACTIVITIES
LIC. CALLS EDUCATIONAL ACTIVITIES
MS, "Wt" / FORCE = Ms x ACCELERATION - EQ!
BE SURE YOU TAKE AWARE!

PLEASE VOTE "YES" ON LAW OF GRAVITY!

Verb "to weigh" is "to measure Wt". Wt is a FORCE, in order to weigh a force-measuring device (poundals or newtons) is needed. Very few exist. Verb "to mass" is needed. Mass (Ms) should be measured. Ms is measured, but this is called, "Wt". Not True. Gov't and scale mfrs lie to the public. TRUTH: "Net Ms". We buy by Ms, not Wt. At P.O. and market Wt is force you feel, but Ms is measured. Comité Int'l Olympique now in 90th year of non-compliance.

U.S. GOVT

SI CONVERSION^a

Discussion by Richard Carl Gerke, Life Member, ASCE

kg UNSAFE!

This paper would have been more helpful if the author had done a literature search before publishing. "SI" Metric has proven unsafe nine years ago (Gerke 1982). The Los Angeles ("Olympic Games") Section, ASCE, *ad hoc* Metric Committee agreed in their report dated September 29, 1982. As one of the Jolly Good Fellows of ASCE this writer apologizes to this author for ASCE's lack of perfect change management. The changeover from unsafe Sterling Standard (SS) to safe Newton Standard (NS) ("NS Metric") could (and should) have taken place before the XXIV Summer Olympiad (Korea 1988) (ASCE's boycott of these games would have been unnecessary). Safety must be first. Our clients, the living things in the solar system, demand safety first.

A summary was published four years ago (Gerke 1987). The original author of that paper declined to submit a closure [see also Gerke (1988)]. What the author calls "Metric System" is French Colonial (FC) Metric. It, like the U.S. customary Sterling Standard (SS), is a bastard system. These systems have no legitimate father. They do not obey Newton's Laws (which, as each disaster demonstrates, are strictly enforced). To obey Atomic Law (energy equals mass [Ms] times c [speed of light] squared) also, like the Law of Gravity (Weight [Wt] equals Ms times g) and like Newton's breakthrough (force equals Ms times acceleration) it is necessary to know what Ms is. Ms is what Babelese (both Ms and Wt are called "Wt") speakers and printed materials call "Wt" 99.99% of the time. Ms/Wt intelligence was given to mankind through the publication of Newton's *Principia* (1687). The on-time arrival of Comet Halley on Christmas Day 1758 proved Newton's Laws. This made a change from Babelese to Newtonese (the Language of Truth, Safety, and Leadership) necessary if we are to progress onward and upward. Three decades later the Constitution of the United States called *Masses* and *Measures* "Weights" and *Measures* (Art I, Sec 8). This one-word law has given planet earth over 200 years of "WtGate" with authority-figures being a party to doing murder by bearing false witness that Ms is "Wt". Words can kill. Babelese impairs education and causes confusion. Nothing is ever "weighed" in a balance. The unsafe W-words ("Wt" and "to weigh") are 99.99% unsafe. Hopefully, the medical profession will help the engineering profession prevent disasters with the tools we need: safe words and safe units of *Masses* and *Measures*. The U.S. Postal Service has

NOTE REQ'D LANGUAGE CHANGE!

U.S. IS AN ORIGINATOR TO 1875 TREATY OF METERS

many intelligent, friendly people who can assist in Ms education until Newtonese printed material is made available. We have a situation similar to the national debt. The longer action is not taken the more it will cost future generations. We cannot afford *not* to change from SS to NS. It should be announced before summer begins so a metric Rose Bowl can be planned for next January 1. The ASCE Board of Directors now has the ball on the 50-meter line. First down. Ten meters to go. It will be exiting to attend the *Massifting* (*Fortius*) events (in ein-units) at Barcelona in 1992-plus-500. Vote for, and listen to, Newtonese speakers. If the United States can now conform to the 1901 Treaty (of Meter-Paris) Agreement on the only legal definitions of "Ms" and "Wt" then 'x' can be proud to be Americans. This will enhance world peace. There is much civil engineering to do. *Delenda sunt kilogramum et poundum. Vive ein. Ich bin ein Berliner. Ein Well.*

My discussion of "Metrication and the American Society of Civil Engineers" (Gerke 1987) contained printing errors in addition to those corrected in the Errata published in January 1988 (Gerke 1988). "Refinement of Yard and Pound" in Federal Register of July 1, 1959 attempted to shorten the foot (ft) by bureaucratic action. One man, two feet? The 1959 foot ("the other foot") is the "1 ft." The ft is greater than the 1 ft. To say that "one foot equals exactly 0.3048 meters" is *not* true. In the mid-1980's we heard that at least one federal agency is publishing maps in which the 1 ft is called a "foot." We cannot have it three ways. Publishing "meters only" avoids confusion.

To convert "pounds" to safe NS Metric multiply them by 4,448 222 (2 to the 2.3, and 1 power). If the pounds are *mass* (LB or LBM) ("Quantity of matter") then you now have ein (E) units. If the pounds are *force* (LBF) or weight (LBRWT) ("Force acting on a mass") you now have Newtons ("new") (N). The erroneous "pounds per square inch" usually means "pounds-force per square inch." All pounds (16 oz and 12 oz) are *not* the same. All ounces are *not* the same: 4,448 222 E mass one 16-oz LB (avdp); 9,806 650 E mass one kilogram (kg); One E weighs one N. "One Albert Einstein weighs one Isaac Newton!" This writer has sent information to the Comité International Olympique at Lausanne, Switzerland since 1982. Hopefully, the printed program for the 1992 XXV Summer Olympiad at Barcelona, Spain will call *Massifting* "Massifting" and will be shown in safe ein (E) units. In this event the ASCE boycott of the Olympics should be released and members encouraged to celebrate 500 years of Christian civilization in the Western Hemisphere at this exiting Spanish port.

WT @ STD g { 1 LB → 32.17 POUNDALS
ON Earth 1 kg → 9,806.650 N (newtons)

APPENDIX. REFERENCES
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Gerke, R. C. (1988). Errata to Discussion of "Metrication and the American Society of Civil Engineers." *J. Prof. Issues Engng.*, ASCE, 114(1), 115-116.

IF YOU CAN SEE IT, IT IS A Ms!

WT IS A FORCE WHICH CAN NEVER BE SEEN, LIFTED, NOR LAID ASIDE"

DICTIONARIES ARE WRONG!

TRUTHFUL BIBLES NEEDED!

^aJanuary, 1990, Vol. 116, No. 1, by T. J. Pilecki (Paper 24235).
¹Junior Partner, Newton, Pascal, Einstein, & Gerke, Consulting Civ. Engrs., CDR Foundation, Sierra Madre, CA 91024-2204.
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A/C TRUTH "Wn" Victory 1-5 - R. C. Gerke
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31

1841

NOTE: READ INSTRUCTIONS
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For Ben D. Alan Bromley Coast to Coast Sci & Tech The White House Old EOB #358 20506

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I was quite an inventor when young. I improved the ignition of the largest airplane engine the new Air Force had in the 1940s. Then with that reputation I designed the six engine B-36 planes, Intercontinental Bombers, to restrain Russian Egotism. This with the new Atomic Bombs we had just used on Japan to end that war. There were other things. Finally I matured morally so that I could have a savings to plow into patents. The engine for the helicopter and the tilt-engine plane of the backside I especially sought. It had to be horizontally opposed and 2 cycle, although not a gasoline and oil mixture engine. Well, I now see that such a 2 cycle engine would be half as heavy designed in liquid cooled version for auto use. Such a series of engines I now foresee for autos, half as heavy as now, will make them go further on gasoline or diesel for those uses. And our economy is in a straits. Here is a source of funds, as these newly engine autos come generally into use, that can pay off the deficit, that is the main trouble with our economy, actually, causing women to work too, etc. Restraining the godless egotism of the Russians, for 45 years, has developed this huge deficit of this country as well as a certain amount of social egotism left to use from Mr. Roosevelt's days. In 1929 the electorate of this country placed a tax on all imports into this country, ignorant of the fact that Europe then was buying our goods. This import duty stopped European imports from being sold in this country, as folk would not buy them at the high price the duty made. This was the aim of the Congress, the house and senate, was to protect the American worker so he would not lose his job from sale of these imports here that all supposed were being made here. Actually, with no sale here of Europe's goods, they had no money to buy ours. So factories here stopped, and those in Europe stopped. The Great Depression of the 1930s set in. All the business people of the country knew that the Congress was the cause of the trouble, at least business leaders. But no one would listen to them in Washington D.C. in the Congress, Congressional committees and all. We had this social egotism pass new social laws in the 1970s and increase of taxes to pay for them. The tax burden was too great and the country went into a recession. Mr. Reagan and the Republican Party with 40 Southern Democrats lowered these taxes, and in a few months business of the nation was humming again and continued to until just lately. If Mr. Roosevelt in 1932 had removed those import duties, business between here and Europe would have rebuilt and the Great Depression of the 1930s would have ceased immediately. But, instead, here were all these social programs ever since, continuing due to this social egotism Mr. Roosevelt engaged in funded by deficit spending to "Help The Poor" etc. If business restrictive laws were removed, and taxing egotism ceased, this recession would be over and the lesson impressed into the future, by the morally sound of this country, times would be good and there would be very few "poor" to socialize over.

Russia had 140 spiritual communities in the country sustained by farming, out from 140 of its cities prior to 1589. These provided moral restraint to the country and the egotistic politicians and business men were restrained alike. That is what we need here. These in Russia, their head, Joseph Sanin, made an agreement with Prince Vassily, so that these were restrained from reproving the politicians. Russia went into 300 years of social decline since not all of the rulers during these years were that morally sound. The church kept declining in its moral restraint on the nation. In 1917 the folk of Russia said, in effect, "If this is business, government and religion we don't want any more of it!" France went through exactly a similar experience, for 300 years.

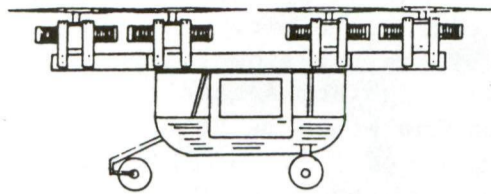
Well, I have five engines now I foresee clearly that will all be 1/2 as heavy and the savings to the economy will pay off this deficit as well as provide for the "Poor". But, a certain amount of production must be located in the country in new moral restraint force acreaged towns, at all the largest cities, that will support such a production, by its size and need for autos to continue, to restrain that city morally and the several of these spiritual units as a whole in the nation, restrain the nation. 2 of the new engines will be superior over the others. One should go to the autos industries generally, their savings paying off the USA deficit. The other should go to these spiritual acreaged towns out from the several cities, their charity using their savings.

I am interesting a group of engineers here, who commonly instruct students in the local School of Engineering in nearby College Place, to lease ground from the college to which it is attached, and, through funding, make up these five engines, with increase of staff, so all can share research activity and all take care of the instructing of the students. They can be the board of trustees of this non-profit, tax exempt research corporation. And the patents will all go to them as a corporation, and since they work for frugal salaries now, and are not out for the highest salaries etc. usually the case, they will be good judges of how to license the patents out, and to which companies under study. The deficit repaying engine should go to the old reliable American Auto Companies now in trouble all. The foreign auto makers selling here will have to go to one of the two engines that cannot see patents, and they are not as especially good, although arguments in their favor can be cited by the builders. They are less complicated is all, and may not cost as much to repair. So foreign auto makers can do their best under these sales possibilities for them. Or they can use their present engines. But, they will come to these new types of engines, not under patents, that are also 2 cycle. The moral restraint units in the country from cities will sell stock to begin.

THE MORAL RESTRAINT EXECUTIVE AIRCRAFT

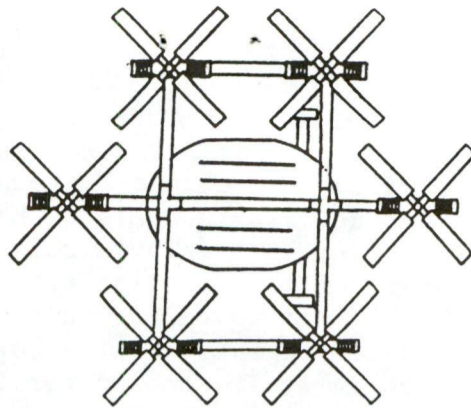
Safe Short Bladed Multi-rotor Helicopters

The Small Six Rotor And Engine Each Helicopter Flies On Any Five Of The Rotors And Engine Each. A Safety Factor No Present Helicopter Has At All. 2 Place Size.



Side View

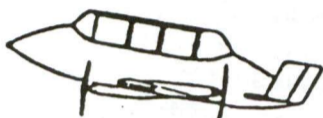
Directional And Turning Control Is Patented. A Special Two Cycle Engine Has Been Designed And Patented To Make This Kind Of Helicopter Possible In It's Several Sizes. Proven By One Of This Type Now Flying.



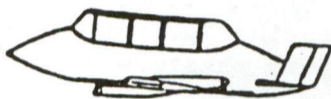
From Above

THE AIRPLANES

This gives us an airplane that will fly 150 to 200 miles per hour in final form that will be faster than the helicopters in going from city to country home and on business errands. You will not be bothered by airport congestion with these. All you need is a place the size of a tennis court to land or take off. This often on top of a building or on the lawn. The piston engine is the same one as the helicopter but specially adapted to this use, and in much larger size. It is patented and will see additional patents during development. A vertical riser plane.

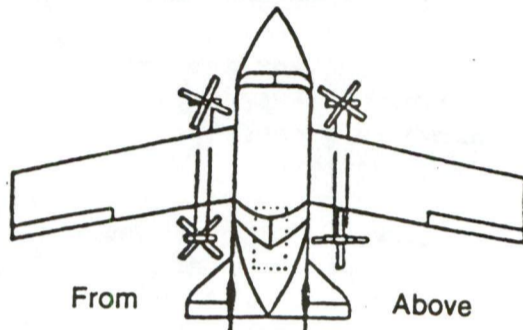


Flying

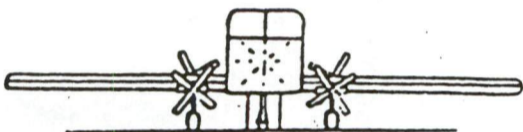


Hovering

Vertical Take Off And Landing. Hovers And Flies On Any 3 of the 4 Engines, A Safety Factor No Helicopter Has.



From Above

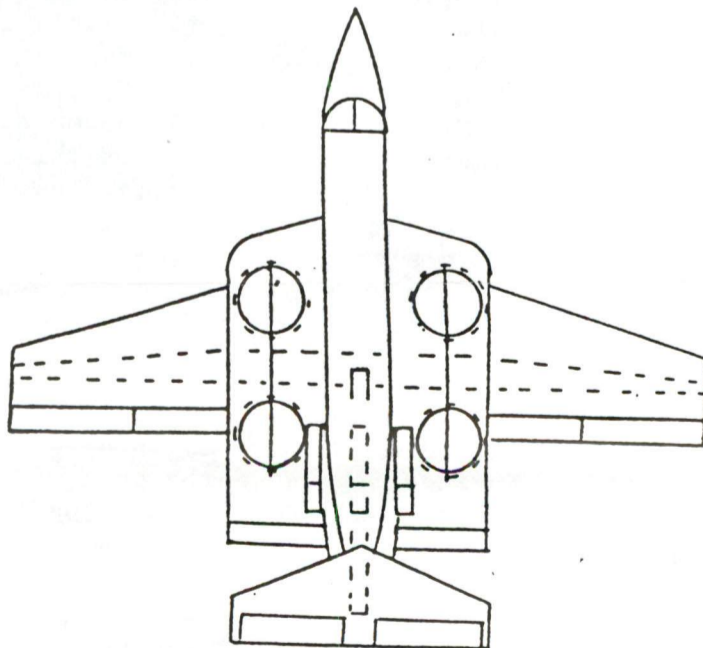
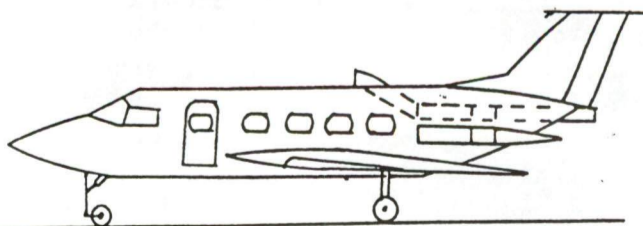
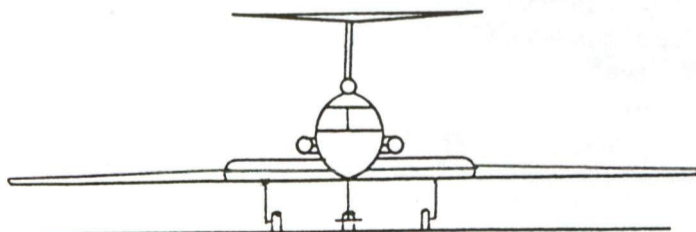


The Engines & Propellers Tip from Horizontal to Vertical



(My Design Originally)

The plane to the left has been made in 2 Aircraft and flown a great deal. It has wing mounted fans spun by jet engine thrust. One fan in the nose. The wing is vented through by doors above and louvers beneath and the plane rises vertically and lands that way and in flight can fly 500 miles per hour. It had a pitching moment at 69 miles per hour and so no more were made. There was good control in the wing mounted fans and so the plane below solves the problem. These planes could land as any airplane or combinations of both. A very simple aircraft. A VTOL plane.



This plane has 3 engines and will fly on any 2. It will carry 5 passengers with 2 pilots as required in turbine or jet aircraft. With good refinement, it will be very durable and simple to maintain. The vertical lift equipment will be used only a few minutes at take off and landing and will not see enough use to wear out. It will place your home still further from the city and you can be there in just a few minutes. It is essentially the same as the aircraft above, except that it can carry more and will have perfect control in hover mode. The patents to these strategic aircraft will be kept by a legal benevolence for moral world objectives. And these aircraft can all be used to good advantage in making business trips. Very Truly, Elmo Kincaid Jr., 1804 Isaacs, #22, Walla Walla, Washington 99362. Patentee. (Copy as needed)

Elmo Kincaid Jr.
1804 Isaacs #22
Walla Walla, WA 99362



Dr. Allam Bromley, Director,
Office of Science & Technology Policy,
The White House,
Washington, D.C.
20500.

Corrected MACL #343.



Dr. Allan Bromley, Director, 12/28/'91.
Office of Science & Technology Policy, Attached #339.
The White House, Washington D.C. 20500. & Auto Engine.

Dear Mr. Bromley,

I have lived a useful life and am now on a small pension here where there is a School of Engineering at this church college. I have proposed a tax exempt, non-profit research corporation to the engineering staff which is well taken by them. I am proposing the several ideas I have patented as a basis of research. That with prototype vehicles done, air and ground, these products can be licensed out to chapters of youth, married kids, who can then ask their stock brokers of their city to sell stock to a real estate & manufacturing corporation to be located in the country out from their city. These auto engines in small autos well designed being the basis of sale to their city. If the chapter were made up from morally sound young people from the several churches of their city, Catholic and Protestant, they would have a total moral impact on their city, especially as their product, as a small longer milage car, was seen upon that city's streets. And they could study promotion as a local T.V. program from their advertizing budget for their city they were 100 miles out from. And this would awaken preachers of that city to the need to use their influence, in their churches to sustain these original premise these youth arrive at. Certainly this kind of moral force reasoning is needed to reduce crime and the continual eroding of our USA System. Under their patents these kinds of cars would be exclusive at all the cities of size of America. A untied moral force in our midst where now it is fragmented and nothing universal being done. And politicians cannot accomplish such a thing.

Russia had 140 of these sustained by farming out from all their cities, 140 of them. And they had a beneficial effect on all Russian life. It was joining these to the rulers that saw their influence weaken and they ceased to have the effect they once had. This happened in 1589. Russia went into 300 years of social and moral decline until they all became atheists in 1917. We spent a lot of money restraining the results. This subject of this kind of auto engine has opened to me. There are five such engines now. We need Energy Department money to start it all off to get one made up and proven. Truly,

Elmo Kincaid Jr.
Elmo Kincaid Jr.

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
01. Report	Description and diagrams of gasoline engine of non-oil and gasoline mixture type (7 pp.)		(b)(4)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: General Science Files
WHORM Cat.:
File Location: Physical Science: General [1 of 8] [1991]

Date Closed: 3/17/2010	OA/ID Number: 62041-001
FOIA/SYS Case #: 2005-0336-F	Appeal Case #:
Re-review Case #:	Appeal Disposition:
P-2/P-5 Review Case #:	Disposition Date:
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TYPE: ACTION

DOCUMENT NUMBER: 9200027

ORIGINATOR: 02

STATUS I

DIRECTORATE STATUS

FROM: LOGAN, Joseph G.: APPLIED ENERGY SCIENCES, INC.

TO: DR. D.A. BROMLEY

DATE OF CORRESPONDENCE: 12/28/91

SUBJECT: A LETTER ASKING FOR OSTP TO OFFER ENCOURAGEMENT TO ACCELERATE THE DEMONSTRATION OF THE POTENTIAL OFFERED BY HIS DRAMATIC ADVANCE IN SCIENTIFIC SOFTWARE DEVELOPMENT.

DIRECTORATE ASSIGNED: PHYSICAL SCIENCES

STAFF ASSIGNED:

ACTION REQUIRED: AS NECESSARY

STAFF ACTION:

OSTP DUE DATE: 01/20/92 SENDER'S DUE DATE: STAFF DUE DATE DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley

WHITE HOUSE TRACKING #: CONTACT PERSON: PHONE: EXT: REMARKS: PLEASE NOTE: HE REFERS TO A PREVIOUS LETTER HE SENT TO DR. ERB.

CLOSED

I answered him on 18 Dec 91 and returned his demo disc - we should not get involved with Logan, as he already has sent me 2 more letters, refusing to ~~take the bait~~ back off. THIS

OSTP RECEIVED: 01/06/92 FILE: P-PHYSICAL SCIENCES

DEPT RECEIVED:

CENTRAL FILES:

technology rates up with perpetual motion machines (see my 18 Dec 91 remarks)

I ignore further letters



APPLIED ENERGY SCIENCES, INC.

1861 North Gaffey Street, Suite B
San Pedro, California 90731

0027
Tel (213) 514-5513

Message (213) 514-5522

Fax (213) 547-1915

December 28, 1991

RECEIVED
92 JAN 6 12:55

Dr. D. Allan Bromley
Executive Office of the President
Washington, D.C. 20506

OSTP
MAIL ROOM

Dear Dr. Bromley:

A copy of recent correspondence, initiated with the Office of Science and Technology Policy to describe a new development in the classical theory of fields that now provides the basis for the creation of a dramatic new form of scientific software, is attached for your interest and information. The impact on new technology development, manufacturing, and the domestic economy could be substantial if the new capability is rapidly exploited.

Dramatic new developments in applied science and engineering can always lead to substantial improvement in the domestic economy as a result of the new investment opportunities, new product development, and the stimulus to manufacturing that can result. A basic description of the new development is summarized below.

The new development that was described to Mr. Erb fits the above category. Classical models can be constructed to behave in a classical particle medium exactly as the fundamental particles have been observed to behave in the vacuum domain. This adds a new dimension to the investigation of physical phenomena at a microscopic level.

Employing the new forms of software designed to enable visualization of simulated atomic phenomena, computer-based "experimental facilities" can be developed to duplicate the phenomena occurring in actual experimental facilities, with the single important difference that the actual particle behavior can be observed.

Investigations can be carried out economically that would require enormous expenditures to duplicate in actual experimental studies.

Small businesses engaged in research and development can have access to facilities for experimental investigations that previously would only have been available to the major corporations capable of large investments. The potential would exist for major improvement in the technical capabilities of businesses engaged in the frontiers of research. Technological capabilities in such fields as materials, chemicals, and energy

D.A. Bromley/J.G. Logan
Page 2
December 28, 1991

would be substantially improved.

It is unfortunate that up to this time, funds have not been made available to enable the demonstration of this new software development capability for industry. This is especially true when it is recognized that the background research that enables the development has been well-documented and described in peer-approved technical papers.

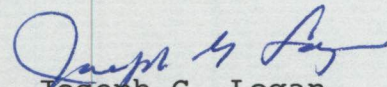
The support for the prototype software demonstration would provide an outstanding example of the importance of transitional funding to support exciting new ideas that can revolutionize technological development.

The required transitional activities to enable the demonstration of the significance of the development would be ideal for consideration by a Federal program such as the Advanced Technology Program being initiated by the National Institute of Standards and Technology.

The need for a prototype demonstration is suggested in the attached copies of recent correspondence with industry. Attempts are now being made to interest major corporations in supporting such prototype development. Encouragement by the Office of Science and Technology Policy could greatly accelerate the demonstration of the potential offered by this dramatic advance in scientific software development.

A copy of recent correspondence with the Editor of The Sciences is also enclosed for your interest.

Sincerely yours,


Joseph G. Logan
President

Attachments

December 27, 1991

Mr. J. Douglas Beason
Senior Policy Analyst
Office of Science and Technology Policy
Executive Office of the President
Washington, D.C. 20506

Dear Mr. Beason:

Thank you for your letter of 18 December 1991 in response to my correspondence to Mr. Erb.

The material mentioned in your letter was merely provided as background material to point out the significance of a little noticed branch of the classical theory of fields, the classical collisionless particle regime. The impact, if the technological implications are considered, could be of major importance.

The audience for the development is not limited. Although the characteristics of the field were originally cited to improve the understanding of electromagnetic phenomena by students, it can be demonstrated for the first time that the phenomena provides the basis for the construction of exact models of atoms and other fundamental particles. The actual behavior of atoms can be visualized when the software modeling capability is developed.

In addition the ability, for the first time, to construct exact classical models of light waves yields the unusual result that a classical parallel of the Einstein-Lorentz relativistic model can be shown to exist. The transverse plane waves in the classical field must necessarily satisfy classical invariance conditions.

This is now being suggested to technical journals, as indicated in an attachment.

What could be at stake, if the potential is not examined and exploited in this nation first, is the leadership in new technology development. It is now possible to design scientific software so that the behavior of fundamental particles can be studied visually. The unique feature is that the force field phenomena are modeled so that the models perform in the computer systems exactly as they would behave in nature.

For the first time, if the capability is developed, it would be possible to design computer-based systems to carry out simulated experiments that could, for example, provide the basis for developing many types of new and improved material and chemical systems. The new capability could ensure leadership in technology.

Environments can be simulated and effects of particle substitution can be examined. Simulation based on the modeling of actual force field

J.D. Beason/J.G. Logan

Page 2

December 27, 1991

effects allows the modeled systems to perform exactly as the actual basic particles would perform under similar environmental conditions. In effect a computer-based experimental laboratory can be developed. The only limitation of the simulation being the sophistication of the computer systems employed to achieve the simulation.

The dramatic new forms of software that could be developed for CAD/CAM applications and for scientific research would significantly improve the current hardware and software markets. New manufacturing opportunities could be created and the resulting economic impact could prove to be substantial under the present Administration.

The potential for the improvement of the technology base becomes obvious when it is recognized that each small firm engaged in development can have access to experimental tools that could easily exceed the current capability of even the major super computer networks carrying out basic investigations of physical phenomena.

Even though the existence of such a capability has not as yet been fully recognized by the scientific community it would be in the best interest of this Administration to at least examine the potential offered by the new modeling capability. There actually exists a much greater potential for the improvement of the domestic economy for the purposes of the Office of Science and Technology Policy than you have implied in your reply.

Because of this potential, similar information is now being provided to industry. Major organizations from the private sector, such as IBM, are being encouraged to explore the potential. The breakthrough aspect is also being suggested.

This technological advance provides a unique example of the type of "breakthrough" technology currently being sought by the Federal Government to improve technology capability. This development could result in a significant increase in manufacturing operations, and stimulate economic growth.

The Office of Science and Technology Policy could assume a lead role in encouraging the examination of the potential. That is the reason for the prior submission of the information to your Office and for the additional material furnished with this reply.

Sincerely yours,



Joseph G. Logan
President

Attachments

cc: ✓ D.A. Bromley
G.E. Brown, Jr.
K. Erb

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9 November 1991

Dr. Joseph Logan
President, F.L.W., Inc.
1861 North Gaffey Street, Suite B
San Pedro, CA
(213) 514-5512

Dear Dr. Logan:

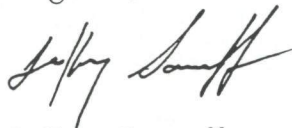
On behalf of all of us at Time Warner who have considered the intellectual property that you have developed, thank you for the concentration and cooperation that you have given to us as we explored the possibility of rights acquisition. After careful review, we will not be pursuing this potential acquisition any further; nor will we be involved directly in the funding of FLW.

As you are aware, this decision is not a reflection of the value of property. It is based upon the desire to focus our near term efforts on our current operating divisions. While we have experience with entertainment and information properties, the development of intellectual property such as yours is not a current focus of our operations. The potentials for enhancing entertainment and information transmission are understood. We look forward to their occurrence.

The most substantial innovation that could come of the work is in science education. For Time Warner, the most exciting potential is that of transmitting holographic wavefronts over cable and through film & videotape, although this may be some years in development. I have had some experience with holographic animation; if it would be helpful, I am happy to share that insight.

Your comprehension has provided me many hours of intellectual stimulation. I appreciate the time that you spent so that I might understand the work and the basic perspective. It has become clear that there is no reason for hesitation about the mathematical paradigm, nor the implicit computational advantage therein.

Regards,



Jeffrey Sarnoff
Director of Strategic Business Systems

APPLIED ENERGY SCIENCES, INC.

1861 North Gaffey Street, Suite B
San Pedro, California 90731

Tel (213) 514-5513

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Fax (213) 547-1915

December 22, 1991

Mr. Peter G. Brown
Editor
The Sciences
Two East Sixty-third Street
New York, New York 10021

COPY

Dear Mr. Brown:

The attached brief Letter concerning the feature article "Starry Messengers" in the January/February 1992 issue of The Sciences is submitted for consideration for publication in the Peer Review Section.

The comments might be of interest to the readers of The Sciences. The scientific community should be aware of the existence of the classical transverse wave propagation phenomena that enable light wave phenomena to be modeled.

Sincerely yours,

Joseph G. Logan
President

Attachment

Heralds of Scientific Revolutions

In a recent article in The Sciences (Jan/Feb 1992, p. 43), entitled "Starry Messengers", F.J. Baumgartner described the scientific revolution that resulted after the sighting of the supernova of 1572 by the Danish astronomer Tycho Brahe.

However, at the conclusion of his article, Baumgartner points out that at the end of Tycho's life Kepler wrote of this supernova: "If the star did nothing else, at least it announced and produced a great astronomer." The description of the new phenomenon was met initially with wide disbelief even though the supernova provided the first hard evidence of the proposal made by Copernicus, the Polish astronomer, twenty-nine years earlier that the earth and the other planets revolved around the sun.

New scientific developments are generally met initially with wide disbelief. Even in the twentieth century, a scientific revolution can be treated with great skepticism or simply ignored.

The Ptolemaic-Copernican controversy involved the appropriate central location for the analyses of phenomena characterizing the solar system. It might be described as having been resolved simply by shifting the location from the center of the earth to the center of the sun.

Scientific revolutions are often based on such simple readjustments in the thought process. The basis for an equivalent scientific revolution might have already occurred in the latter half of, this, the twentieth century.

In 1956, in a research paper published in the Journal of Mathematical Physics (35, p. 1965, 1956) a brief mention was made of the observation of the existence of a transverse disturbance propagation mode in classical collisionless particle domains, an extremely rarefied domain encountered in all continuum fluid media. The domain dimensions are established by the local density when the characteristic undisturbed field particle travel is less than one mean free path. Approximately three decades later H.T. Yang, one of the authors of the original paper by H.T. Yang and L. Lees, published an updated version of the early discovery entitled, "The Propagation of Transverse Disturbances in Free-Molecule Flow" (J. Appl. Phys., 66, 3947, 15 Oct. 1989).

The little noticed significant development was that this transverse propagation mode, providing the first classical model of a light wave or plane transverse disturbance described by the Maxwell equations, was necessarily invariant under classical Galilean transformation.

Any observation of this classical wave speed in a free particle medium in an inertial reference frame would consequently yield

only the constant speed of the wave, a speed that would be completely independent of the constant velocity of the inertial reference frame. The physical basis was simply that, in the independent Maxwellian particle stream transporting the disturbance or wave, the center of any spherical emitted stream remained fixed at the source of the emission, i.e., the emitted stream acquired, and therefore moved with, the velocity of the emitter. Any observer could only measure the average constant speed of the wave propagating within the independent stream. The center of the spherical wavefront always coincides with the emitter location in an inertial frame possessing a constant velocity. Maxwellian velocity distributions are, of course, known to demonstrate invariance under classical Galilean transformation.

The classical propagation phenomena provided the first examples of wave propagation phenomena that satisfied Einstein's Postulates. The only requirement is that the wave phenomena be characterized by a single space coordinate. The suggestion of the existence of a classical alternate to the Einstein-Lorentz transformation requirement could truly provide the basis for a scientific revolution.

Here, the shift of the location of the center of an emitted spherical wave from a fixed emission point in space to a point that remains fixed at the center of an emitting source, moving with the constant velocity identified with the inertial frame in which it is emitted, suggests the ability to develop a model that provides an alternate to the concept of a relativistic time and a fixed space source location for describing electromagnetic transverse wave propagation phenomena. The alternate classical concept is that of a universal time and an emission source and emitted Maxwellian photon stream possessing the constant velocity motion of the inertial frame. The motion of the center of the emitted stream would coincide with the motion of its emitting source in any inertial reference frame characterized by an arbitrary constant velocity. The observed speed of a wave would be identical to that observed in an inertial frame at rest. Einstein's postulates would be satisfied and parallel, equivalent, and alternate classical interpretations of the Einstein-Lorentz formulations could, therefore, exist.

Professor Lees died a few years ago. He was recognized for his substantial contributions in the fields of aerodynamics and aerophysics at the California Institute of Technology. Possibly, within the next hundred years, he might also be recognized for having helped to create a scientific revolution.

J.G. Logan

Applied Energy Sciences, Inc
San Pedro, California

APPLIED ENERGY SCIENCES, INC.

1861 North Gaffey Street, Suite B
San Pedro, California 90731

Tel (213) 514-5513

Message (213) 514-5522

Fax (213) 547-1915

December 7, 1991

Mr. D.R. Clair
President
Exxon Research and Engineering Company
P.O. Box 101
Florham Park, New Jersey 07932

COPY

Dear Mr. Clair:

This letter is being sent to members of the ChemTech consortium because the members should become aware that recent developments in the classical theory of fields now enable visual models of accurately simulated atomic systems to be developed. This practical software development could soon render the ChemTech approaches for molecular, chemical, and material analyses obsolete.

Please treat the attached correspondence copies as privileged.

Theoretical chemists and physicists are only now beginning to recognize that the unique phenomena that have been shown to characterize classical collisionless particle domains can be adapted to enable accurate simulation of quantum behavior. Most theoretical physicists should be aware that a recent published article in the Journal of Applied Physics has demonstrated that classical transverse wave propagation phenomena have been shown to characterize this regime. Electromagnetic radiation phenomena can be accurately modeled, and since the phenomena are classical, invariance under classical Galilean transformation can be demonstrated. In collisionless domains modeling vacuum field behavior, Einstein's postulates are satisfied and the effects of Einstein's special theory can, therefore, also be duplicated classically.

A completely new and dramatic form of simulation and modeling can therefore be shown to exist. It enables the visualization of physical phenomena at microscopic levels in real time. The classical modeling approach allows actual force field phenomena to be reproduced so that the modeled basic particles reproduce the behavior of natural systems. The systems become self-calculating and self-determining.

Rights to the development are now being offered to selected firms before there is a wider recognition of the capability. Since the development is of importance for increasing the hardware and software markets for education, research, and industrial

D.R. Clair/J.G. Logan
Page 2
December 7, 1991

applications, it has been brought to the attention of President George Bush's Administration for the potential impact on business and the Gross Domestic Product if it is exploited rapidly. This is also indicated in the enclosed copies.

If there might be interest in supporting the development of the new code forms that will prove to be greatly superior to those based on the current mathematical approaches employed in the development of the ChemTech software, this early opportunity is being offered for the acquisition of the rights.

Sincerely yours,

Joseph G. Logan
President

Enclosures

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December 28, 1991

Mr. John W. Lowe
Program Manager, Commercial Relations
Office of the Director of Commercial Relations
International Business Machines, Inc.
2000 Purchase Street
Purchase, New York 10577

COPY

Dear Mr. Lowe:

Thank you for your letter of 18 December 1991. There was no intent to imply a counselor/client relationship in the correspondence that was furnished for your information. The purpose of the attachments were to indicate that an activity was being initiated to produce a general awareness of the significance of an overlooked area of the classical theory of fields, an area that has been well-described and well-documented in the literature.

The attached material is not to be treated as privileged.

The purpose was to suggest that recent overlooked theoretical developments could provide the basis for the design of new forms of scientific software that could produce a significant technological impact. That impact is being suggested in similar correspondence to other industrial organizations.

The physics community has essentially overlooked the phenomena in a rather obscure branch of the classical theory of fields. Hence few physicists are aware of the capability that now exists to visually model fundamental particle behavior and simulate atomic phenomena. As a consequence, industrial organizations have not been, and could not be, properly advised of the existence of the impact that could be produced on sales and profits as a result of the acquisition of rights. The technological impact will only be realized by this general community when the first three-dimensional visualization codes are demonstrated.

Our primary interest has been in the educational potential. However, the interest in the design of software for the improvement in the technological capability for industrial applications and for the improvement in the domestic economy should be a motivating factor by major industrial organizations to achieve control of the new capability and demonstrate the potential through a practical prototype development.

Sincerely yours,

Joseph G. Logan
President

December 11, 1991

COPY

Mr. John F. Akers
Chairman of the Board
International Business Machines, Inc.
2000 Purchase Street
Purchase, New York 10577

Dear Mr. Akers:

I am certain that you have seen copies of comments such as the one attached from the Los Angeles Times concerning the reorganization that is now being planned at IBM.

The purpose of this letter is simply to point out again that IBM should exploit the economic potential that can be identified with the control of rights to a dramatic new scientific software development. The development enables the visual modeling of the behavior of atoms and molecules and other fundamental particles at their actual microscopic levels and interaction times.

It is now possible to study and control simulated atomic behavior for design purposes. The unique feature is that the behavior of the modeled systems can occur exactly as in nature at representative laboratory conditions because the modeling is based on the simulation of the actual force field phenomena identified with the basic particles.

The rights to the new approach, based on some overlooked classical research at the California Institute of Technology, were first offered to IBM because it was the major computer organization with the appropriate resources in both computer hardware and software. IBM also possessed the appropriate recognition of the significance of providing support for research in fundamental physical phenomena.

The new code development can impact all areas of scientific education and industrial applications requiring improved understanding of physical phenomena at the microscopic level. It will influence all computer hardware markets including those for: supercomputers, mainframes, minicomputers, workstations, and personal computers. The supercomputers and mainframes are required initially to carry out the basic code design and development that is necessary to achieve the required modeling accuracy and provide the required accuracy for fundamental research investigations of basic phenomena.

The developed basic software for the detailed research and industrial development applications can then be adapted for specific minicomputer and workstation applications including visualization.

J.F. Akers/J.G. Logan
Page 2
December 11, 1991

Specific limited applications can also be carried out at the personal computer levels, primarily for educational purposes. An animation and graphics capability is a basic requirement for the full exploitation of the opportunities offered by this new classical modeling approach.

It was hoped that the early Time Warner interest would lead to support for a practical demonstration at a level that would be of interest for industrial applications. Some of the materials scientists in your research laboratories have been in contact with members of Time Warner corporation concerning the potential of the modeling approach.

Although our interests at Applied Energy Sciences are primarily in the educational aspects identified with the applications for personal computers, the economic and technological applications are of primary significance for future domestic economic development.

It was also the possible influence on economic development at the national level that could result, if the full IBM computer resources were used to exploit the potential, that provided the motivation for initially offering the rights to IBM.

The importance of early exploitation is suggested in several of the attached copies of correspondence. Please treat the material as privileged. Many of President George Bush's goals, economic and educational, could be achieved if the potential was rapidly exploited, in spite of the resistance that will be shown by some members of the theoretical physics community. The potential is well-described in the technical literature. It is just that the research has been ignored up to this time by the physicists. As is indicated in the copy of the letter to the Washington Post, any investigative reporter willing to examine the technical literature can recognize the modeling basis. The existence cannot continue to be overlooked and the modeling potential ignored by some members of the physics community and the press.

As mentioned above, the simultaneous contribution that IBM could make to the national economy is one reason that IBM should consider the exploitation of the visual modeling capability, in addition to its own profit.

Sincerely yours,

Joseph G. Logan
President

Attachments

APPLIED ENERGY SCIENCES, INC.

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San Pedro, California 90731

Tel (213) 514-5513

Message (213) 514-5522

Fax (213) 547-1915

December 28, 1991

COPY

Gloria B. Lubkin
Editor
Physics Today
335 East 45th Street
New York, New York 10017

Dear Ms. Lubkin:

The attached Letter might be of interest for
publication in the Letters Section.

Sincerely yours,

Joseph G. Logan
President

Enclosure

More on Lessons in Humility

In a recent Reference Frame article in Physics Today (December 1991, p. 9), Daniel Kleppner emphasized the need for humility when trying to forecast the future of physics. He suggested that the only thing that scientists can forecast with much accuracy is an eclipse, and pointed out that veteran science forecasters invariably qualify their discussions with cautionary statements to the effect that because the exciting discoveries are unpredictable, their predictions cannot pretend to do justice to the glorious potential of their particular fields.

He then listed a number of significant advances that were missed hardly more than five years after the last ten year forecast of the Brinkman committee. The listing included nonlinear dynamics and chaos theory. It was mentioned that the last Brinkman physics survey hardly noticed that classical mechanics was on the threshold of a renaissance.

It is unfortunate that Daniel Kleppner did not also point out that very significant developments in physical theory, and in classical mechanics, are frequently overlooked when they are first described. One such development occurred in the classical mechanics in the latter part of the fifth decade in this century that, if recognized at that time, might have changed the course of the development of physical theory.

That development was the little noticed discovery that a plane transverse disturbance propagation mode was observed to emerge as the dominant wave propagation mode in extremely rarefied (collisionless) particle domains.

In a recent publication (J. Appl. Phys., 66, 15, October 1989, p. 3947) one of the early authors, Hsun-Tiao Yang, provided additional details concerning the discovery. The significance, of course, is that this provided the first description of a transverse propagation mode that could duplicate the behavior of a plane electromagnetic wave. Such a transverse disturbance in the classical field must exhibit invariance under Galilean transformation. In a collisionless domain, as a consequence, only the invariant speed of the transverse wave can be measured.

This provides the first model of classical wave propagation that satisfies the Einstein postulates. The center of a spherical wave emitted in an inertial frame moving with an arbitrary constant velocity acquires the velocity of the emitter. The only wave propagation speed that can be observed is equivalent to the speed that would be observed if the inertial frame in which it was created was at rest. The overall emitted stream behaves just as any observer and any measuring instrument in a moving inertial frame.

This is easily shown because the independent streams created in

an idealized domain possess Maxwellian distributions in velocity. Classical Maxwellian streams are known to be invariant under Galilean transformation. All components of the stream acquire the same velocity increment and the center of a spherical stream therefore appears fixed within the inertial frame. The speed of propagation of the wave is determined from the normal averaging process over the energies of the components for the calculation of the constant wave speed.

This classical model satisfies the requirements of the Einstein postulates because only the speed of the wave carried within the independent stream can be observed or measured in an inertial frame. As a consequence, the description of all field phenomena in classical collisionless particle domains can be described within the framework of the classical Newtonian mechanics.

Simply by assuming that the vacuum domain can be characterized by photons that do not interact, but possess a Maxwellian distribution in velocity when photon streams are produced as a result of absorption and emission processes, a transition can be made from the Einstein-Lorentz framework for the description of electromagnetic wave propagation to a framework that enables an equivalent description within the classical Newtonian mechanics.

Alternate and parallel classical descriptions and interpretations of the Einstein developments should therefore exist. This would truly place classical mechanics on the threshold of a renaissance.

Should not this discovery and description of the classical particle field parallel of a light wave be considered as a significant, but ignored, advance?

Joseph G. Logan
Applied Energy Sciences, Inc.
San Pedro, California

On the propagation of transverse disturbances in free-molecule flow

H. T. Yang

Department of Aerospace Engineering, University of Southern California, Los Angeles, California 90089-1191

(Received 10 February 1989; accepted for publication 11 July 1989)

It is shown that the propagation of transverse disturbances in free-molecule flow could be either diffusive or wave-type dependent upon the averaging process. Parallel to the reasoning in the continuum limit, we conclude that the process is governed by the classical transverse wave equation with the isothermal speed of sound as the propagation speed. Furthermore, the governing equation is invariant under Galilian transformation.

The propagation of transverse disturbances is typified by the Rayleigh problem¹ and is further studied in the present version of finite duration for the impulsive motion. Here an infinite flat plate is impulsively started to move with a constant velocity U in its own plane for a finite duration $0 < t < T$. In the Knudsen limit of free-molecular flow, this disturbance is propagated solely by the collision of the gas molecules with the moving plate. The molecular speed ranges from zero to infinity. In principle, this disturbance could be felt instantaneously at infinity. In other words, the process is diffusive in nature. Practically, the observed quantities are the averages. The averaged disturbance such as the tangential flow velocity and shear stress of the gas, as shown below, propagate with the Newtonian isothermal speed of sound, which is interestingly the root mean square of the one component of the molecular velocity.² The process is, in contrast, of the wave type.

From the preceding discussion, it is evident that the description of the propagation of transverse disturbances in free-molecular flow depends on the averaging processes; even so is the continuum limit. (See Ref. 3) In the free-molecule flow limit, the molecular velocity distribution is discontinuous, but the integrated moments, i.e., the average flow quantities such as velocity and shear stress, are continuous. As worked out in Yang and Lees,⁴ the molecular velocity distribution in free-molecular flow for Rayleigh's problem is

$$\begin{aligned}
 f(t, r, \xi) &= \frac{\rho_0}{(2\pi RT_0)^{3/2}} \exp\left(-\frac{\xi^2 + \eta^2 + \zeta^2}{2RT_0}\right) \quad \eta < \frac{y}{t} \\
 &= \alpha \frac{\rho_0}{(2\pi RT_0)^{3/2}} \exp\left(-\frac{\xi^2 + \eta^2 + \zeta^2}{2RT_0}\right) \\
 &\quad + (1 - \alpha) \frac{\rho_0}{(2\pi RT_0)^{3/2}} \left(\frac{T_0}{T_w}\right)^2 \\
 &\quad \times \exp\left(-\frac{(\xi - U)^2 + \eta^2 + \zeta^2}{2RT_w}\right) \quad \eta > \frac{y}{t}. \quad (1)
 \end{aligned}$$

Here $f(t, r, \xi)$ is the molecular velocity distribution function such that $(1/m) \int_{-\infty}^{\infty} f(t, r, \xi) d\xi = N(t, r)$ is the number density of molecules at time t and space r , with m being the mass of the molecule, $\xi = i\xi + j\eta + k\zeta$ is the molecular velocity vector, $i, j,$ and k are unit vectors in the $x, y,$ and z directions, $\rho = mN$ is the density of gas, T is the absolute temperature, R is the gas constant, U is the impulsive velocity of the plate in its own plane, y is the coordinate normal to the plate, and α is the fraction of incident gas which is specularly reflected from the plate. Subscripts 0 and w refer to quantities pertinent to the undisturbed gas and the moving wall, respectively. As seen from Eq. (1), the molecular velocity distribution function is discontinuous except for the unlikely case of totally specularly reflecting wall of $\alpha = 1$. The flow quantities are obtained in Ref. 4 by taking moments of the distribution function in Eq. (1). For the linearized case of a diffusive wall

$$\frac{U}{\sqrt{2RT_0}} \ll 1, \quad \frac{T_w}{T_0} \approx 1, \quad \alpha = 0, \quad (2)$$

the tangential flow velocity and shear stress expressions therein reduce to

$$U(t, y) = U \frac{1}{2} \operatorname{erfc}\left(\frac{y}{\sqrt{2RT_0 t}}\right), \quad (3)$$

$$\rho_{xy}(t, y) = \rho_0 U \sqrt{RT_0} (1/\sqrt{2\pi}) e^{-y^2/2RT_0 t}. \quad (4)$$

Obviously, the profiles of flow quantities are not only continuous but also diffusive in space, i.e., the disturbances of the transverse plate motion is felt instantaneously everywhere (see also Bird.⁵)

On the other hand, if one averages the Boltzmann equation by taking moments first and then solves for the flow quantities, the solutions are discontinuous with the wavefront propagating at the isothermal speed of sound $\sqrt{RT_0}$. Such solutions are obtained by Yang and Lees⁶ and Lees.⁷ Consider a flat plate impulsively started to move in its own plane for a finite duration T . The governing partial differential equations together with their initial and boundary condi-

tions for a diffusive wall in the free-molecule limit are' as follows:

P.D.E.

$$\rho_0 \frac{\partial u}{\partial t} = \frac{\partial p_{xy}}{\partial y}, \quad (5)$$

$$-\frac{\partial p_{xy}}{\partial t} + \rho_0 R T_0 \frac{\partial u}{\partial y} = 0; \quad (6)$$

I.C.

$$u(0, y) = 0, \quad (7)$$

$$p_{xy}(0, y) = 0; \quad (8)$$

B.C.

$$u(t, 0) = \frac{1}{1 + \sqrt{\pi/2}} U, \quad 0 < t < T = 0, \quad t > T, \quad (9)$$

$$p_{xy}(t, 0) = -\frac{1}{1 + \sqrt{\pi/2}} \rho_0 U \sqrt{RT_0} \quad 0 < t < T, \\ = 0 \quad t > T. \quad (10)$$

The solution of the preceding linear system is

$$u(t, y) = 0 \quad t < \frac{y}{\sqrt{RT_0}}, \\ = \frac{1}{1 + \sqrt{\pi/2}} U \frac{y}{\sqrt{RT_0}} < t < \frac{y}{\sqrt{RT_0}} + T, \\ = 0 \quad \frac{y}{\sqrt{RT_0}} + T < t, \quad (11)$$

$$p_{xy}(t, y) = 0 \quad t < \frac{y}{\sqrt{RT_0}}, \\ = -\frac{1}{1 + \sqrt{\pi/2}} \rho_0 U \sqrt{RT_0} \frac{y}{\sqrt{RT_0}} < t < \frac{y}{\sqrt{RT_0}} + T, \\ = 0 \quad \frac{y}{\sqrt{RT_0}} + T < t. \quad (12)$$

If we let $T \rightarrow \infty$, we recover the free-molecule limit of the classical Rayleigh problem as in Ref. 7,

$$u(t, y) = 0 \quad y > \sqrt{RT_0} t, \\ = \frac{1}{1 + \sqrt{\pi/2}} U \quad y < \sqrt{RT_0} t, \quad (13)$$

$$p_{xy}(t, y) = 0$$

$$= -\frac{1}{1 + \sqrt{\pi/2}} \rho_0 U \sqrt{RT_0} \quad y > \sqrt{RT_0} t, \\ y < \sqrt{RT_0} t. \quad (14)$$

It is seen that the profiles of flow quantities are discontinuous and of the wave type in space. The transverse disturbances propagate with the isothermal speed of sound $\sqrt{RT_0}$.

The preceding study on the diffusive and wave nature of transverse disturbance propagation in free-molecule flow has an interesting parallel in heat conduction. The classical heat equation is⁸

$$\frac{\partial T}{\partial t} = \kappa \nabla^2 T. \quad (15)$$

Here κ is the thermal diffusivity and ∇^2 is the Laplacian $= \partial^2/\partial y^2$ in our present problem of transverse disturbance. The solution to heat Eq. (15) with zero initial temperature and constant surface temperature T_w for a semi-finite solid is

$$T(t, y) = T_w \operatorname{erfc}(y/2\sqrt{\kappa t}). \quad (16)$$

The temperature distribution is continuous and diffusive in space. Incidentally, Eq. (16) is analogous to the velocity distribution of the continuum limit of the Rayleigh problem, namely

$$u(t, y) = U \operatorname{erfc}(y/2\sqrt{\nu t}), \quad (17)$$

where ν is the kinematic viscosity of the continuum fluid. In either case, the disturbance is felt instantaneously everywhere. Morse and Feshbach³ pointed out that "As such instantaneous propagation of heat is impossible, we must assume that the diffusion equation is correct only after a sufficiently long time has elapsed. The time depends naturally upon the mean free path of the gas molecules." They suggest the telegraph equation for the transient heat conduction

$$\frac{1}{a^2} \frac{\partial^2 T}{\partial t^2} + \frac{1}{\kappa} \frac{\partial T}{\partial t} = \nabla^2 T, \quad (18)$$

where $a = \sqrt{\gamma RT_0}$ is the isentropic speed of sound in the ambient and γ is the ratio of specific heats. Equation (18) was later derived from the problem of linear random walk by Weyman,⁹ who also showed its validity does not extend to high-frequency disturbances or to noncontinuum gas. In a related work,¹⁰ the Bhatnagar-Gross-Krook approximation to the Boltzmann equation collision integral is modified, so that the time to reach equilibrium is rendered finite from infinite. From the viewpoint of the kinetic theory, the velocity of heat propagation is thus made finite. In fact, the concept of hyperbolic heat conduction could be traced back to Maxwell,¹¹ and is being investigated quite extensively. The most recent work at this writing is that of Glass and McRae.¹² This leads to the conjecture that the classical Ray-

leigh problem in the continuum limit should perhaps be governed by the type of Eq. (18) rather than that of Eq. (15).

Returning to the Knudsen limit, the governing Eqs. (5) and (6) combined yield the wave equation

$$\frac{1}{c^2} \frac{\partial^2 \phi}{\partial t^2} = \frac{\partial^2 \phi}{\partial y^2}. \quad (19)$$

Here c is the isothermal speed of sound $= \sqrt{RT_0}$ and $\phi(t, y)$ is any transverse disturbance. On physical and mathematical grounds presented above, we conclude that the propagation of transverse disturbances in the Knudsen limit of free-molecule flow is governed by the wave Eq. (19).

There is another interesting feature of the propagation of transverse disturbances. The wave equation in general is invariant under Lorentz transformation. However, in the special case of Eq. (19) governing transverse disturbances is invariant under the Galilian transformation

$$x' = x - Ut. \quad (20)$$

Intuitively, the transformation is in the x direction, while the independent space variable y is orthogonal to it. Hence, transformation (20) has no effect on Eq. (19). For physical and mathematical details, in this aspect, see the work of Logan¹³ and of De La Rosa.¹⁴ In fact the classical field equations of Maxwell, when combined to describe the propagation of transverse electromagnetic disturbances in free space^{15,16} is identical in form to Eq. (19) and therefore invariant under Galilean transformation (20).

The author wishes to thank Dr. J.G. Logan, President, Applied Energy Sciences, Inc. for suggesting and partially supporting this study.

¹J. G. Logan, *J. Aero. Sci.* 29, 1011 (1962).

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¹⁴D. B. G. De La Rosa (to be published).

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¹⁶S. Ramo, J. R. Whinnery, and Th. Van Duzer, *Fields and Waves in Communication Electronics* (Wiley, New York, 1954), pp. 131-136.

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TYPE: INFORMATION DOCUMENT NUMBER: 9125273
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FROM: DISHER, E.O.: UNITED ILLUMINATING

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 12/24/91

SUBJECT: HE IS FORWARDING A DIAGRAM SHOWING THE ROUTE OF THE
NEW ENGLAND POWER POOL'S INTERCONNECTION WITH
HYDRO-QUEBEC.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
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PHYSICAL SCIENCES

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December 24, 1991

USTP
MAIL ROOM

Dr. D. Allan Bromley
Science Advisor to the President
The White House
Washington, DC 20500

Dear Dr. Bromley:

Enclosed is a diagram showing the route of the New England Power Pool's interconnection with Hydro-Quebec. I have highlighted the line and its connected substations and have indicated the power carrying capability of each substation.

If any additional information would be helpful, please call me at (203) 777-7025.

Yours very truly,

E.O. Disher
Manager - Transmission Planning
and NEPOOL Affairs

EOD:ekb
EOD1224A
Enclosure

Withdrawal/Redaction Sheet

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02. Diagram	Diagram showing route of New England Power Pool's Interconnection with Hydro Quebec (2 pp.)	12/24/91	(b)(1)	

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THE WHITE HOUSE

January 3, 1992

Dear Mr. Fisher:

Many thanks for the detailed map
of the New England Power Pool's
interconnection with Hydro Quebec.
It's just what I needed.

Best wishes for the New Year.

Sincerely,
D. Alan Bromley

"Document Control"

TYPE: ACTION DOCUMENT NUMBER: 9200020
ORIGINATOR: 02 STATUS I DIRECTORATE STATUS

FROM: FINERTY, Michael P.

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 12/20/91

SUBJECT: HE REQUESTS ASSISTANCE IN OBTAINING COMPUTERS TO
CONTINUE HIS RESEARCH, AND HE WANTS RECOGNITION FOR
THE PROJECTS HE HAS OUTLINED IN HIS LETTER.

DIRECTORATE STAFF
ASSIGNED: PHYSICAL SCIENCES ASSIGNED:

ACTION STAFF
REQUIRED: AS NECESSARY ACTION: No action needed. 1/7/92
JDF

SENDER'S DUE DATE:
OSTP DUE DATE: 01/20/92 STAFF DUE DATE I agree
DATE COMPLETED: DATE COMPLETED/DEPT: 1/15
WAE

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Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
03a. Letter	To: Allan Bromley From: Michael Finerty Re: Request for assistance [personal information redacted] (4 pp.)	12/20/91	(b)(6)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: General Science Files
WHORM Cat.:
File Location: Physical Science: General [1 of 8] [1991]

Date Closed: 3/17/2010	OA/ID Number: 62041-001
FOIA/SYS Case #: 2005-0336-F	Appeal Case #:
Re-review Case #:	Appeal Disposition:
P-2/P-5 Review Case #:	Disposition Date:
AR Case #:	MR Case #:
AR Disposition:	MR Disposition:
AR Disposition Date:	MR Disposition Date:

RESTRICTION CODES

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

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

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

PRM. Removed as a personal record misfile.

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

- (b)(1) National security classified information [(b)(1) of the FOIA]
- (b)(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
- (b)(3) Release would violate a Federal statute [(b)(3) of the FOIA]
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- (b)(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
- (b)(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
- (b)(9) Release would disclose geological or geophysical information

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
03b. Letter	To: VA Regional Office From: Michael Finerty Re: Request for assistance [personal information redacted] (4 pp.)		(b)(6)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: General Science Files
WHORM Cat.:
File Location: Physical Science: General [1 of 8] [1991]

Date Closed: 3/17/2010	OA/ID Number: 62041-001
FOIA/SYS Case #: 2005-0336-F	Appeal Case #:
Re-review Case #:	Appeal Disposition:
P-2/P-5 Review Case #:	Disposition Date:
AR Case #:	MR Case #:
AR Disposition:	MR Disposition:
AR Disposition Date:	MR Disposition Date:

RESTRICTION CODES

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

PRM. Removed as a personal record misfile.

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

- (b)(1) National security classified information [(b)(1) of the FOIA]
- (b)(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
- (b)(3) Release would violate a Federal statute [(b)(3) of the FOIA]
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- (b)(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
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Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
03c. Letter	To: Congressman Ed Pastor From: Michael Finerty Re: Request for assistance [personal information redacted] (2 pp.)		(b)(6)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: General Science Files
WHORM Cat.:
File Location: Physical Science: General [1 of 8] [1991]

Date Closed: 3/17/2010	OA/ID Number: 62041-001
FOIA/SYS Case #: 2005-0336-F	Appeal Case #:
Re-review Case #:	Appeal Disposition:
P-2/P-5 Review Case #:	Disposition Date:
AR Case #:	MR Case #:
AR Disposition:	MR Disposition:
AR Disposition Date:	MR Disposition Date:

RESTRICTION CODES

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

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

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

PRM. Removed as a personal record misfile.

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

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

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--IF YOU NEED TO MAKE CORRECTIONS OR ADDITIONS, please print or type them in the blank area to the right of the text. Be sure to spell out all abbreviations.

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[Handwritten Signature] 1 Dec 9
Signature Date

Michael Palmer Finerty
2970 E 5th St
Tucson, AZ 85716

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AS FINERTY, MICHAEL PALMER, retired
AR educator; b. N.Y.C., Oct. 5, 1943; s.
John Frederic and Catherine (Palmer) F.; m.
Meganne Wiseman, Nov. 27, 1982 (div. 1988); 1
JU 010 child, Jennifer Etta. BA in Math.,
20 U. Ariz., 1965, MA, 1974.
AR 010 English tchr. U. Ariz., Tucson, 1969,
20 030 grad. libr. asst., 1974; math. tchr.
Phoenix Indian High Sch., 1983-84;
40 physics tchr. Am. Sch. Found.,
RE Guadalajara, Mexico, 1988; cons.
IV Vol. health educator Amistad Found., Palo
Alto, Calif., 1990-91. With U.S. Army,
WD 1966-68. Recipient Amistad Found. grant
EM Sierra of Jalisco, 1989-90. Mem. AAAS,
Tucson Amateur Astronomers Assn., Internat.
OL Dark Sky Assn. Republican. Roman
CH Catholic. Achievements include design of
tuned linear accelerator, 1986; design of
fractional wavelength tuned linear
accelerator, 1989; design of spectrochromatic
imaging device, 1975; extended range of
calculators and showed it to be useful
extension. Home: 2970 E 5th St
DR 010 Tucson AZ 85716 (602) 795-0464
20 Office: APDO # 210, Zapopan, PC 45101
Mexico

← 9 have 2 PA's
English 1970
Drama 1974

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*SC01GNN---208343550

*SC01GNN---2083435510

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*SC01GNN---208343550

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Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
03d. Form	Department of Veterans Affairs form [personal information redacted] (2 pp.)	12/25/91	(b)(6)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: General Science Files
WHORM Cat.:
File Location: Physical Science: General [1 of 8] [1991]

Date Closed: 3/17/2010	OA/ID Number: 62041-001
FOIA/SYS Case #: 2005-0336-F	Appeal Case #:
Re-review Case #:	Appeal Disposition:
P-2/P-5 Review Case #:	Disposition Date:
AR Case #:	MR Case #:
AR Disposition:	MR Disposition:
AR Disposition Date:	MR Disposition Date:

RESTRICTION CODES

<p>Presidential Records Act - [44 U.S.C. 2204(a)]</p> <p>P-1 National Security Classified Information [(a)(1) of the PRA] P-2 Relating to the appointment to Federal office [(a)(2) of the PRA] P-3 Release would violate a Federal statute [(a)(3) of the PRA] P-4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA] P-5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA] P-6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]</p> <p>C. Closed in accordance with restrictions contained in donor's deed of gift.</p> <p>PRM. Removed as a personal record misfile.</p>	<p>Freedom of Information Act - [5 U.S.C. 552(b)]</p> <p>(b)(1) National security classified information [(b)(1) of the FOIA] (b)(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA] (b)(3) Release would violate a Federal statute [(b)(3) of the FOIA] (b)(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA] (b)(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA] (b)(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA] (b)(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA] (b)(9) Release would disclose geological or geophysical information</p>
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"Document Control"

TYPE: INFORMATION DOCUMENT NUMBER: 9125139
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: AGNEW, Harold M.

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 12/12/91

SUBJECT: A COPY OF HIS LETTER TO DR. SIDNEY DRELL STATING HIS
VIEW THAT USING THE BRAIN POWER OF JASON TO LOOK AT
THE USE OF ACCELERATORS FOR TRITIUM PRODUCTION IS
UNWARRANTED.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

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

COPIES TO: D. Allan Bromley
PHYSICAL SCIENCES

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

OSTP RECEIVED: 12/17/91 DEPT RECEIVED:
FILE: P-PHYSICAL SCIENCES
CENTRAL FILES:

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I

HAROLD M. AGNEW
322 PUNTA BAJA DRIVE
SOLANA BEACH, CA 92075

RECEIVED
619 481-8908
A 9: 50

December 12, 1991

GSTP
MAIL ROOM

Dr. Sidney D. Drell
Stanford Linear Accelerator Center
Stanford University
P. O. Box 4349
Stanford, CA 94309

Dear Sid,

Will Happer mentioned that Jason would be looking at the use of accelerators for tritium production with you as chairman. I don't believe it warrants the brain power of Jason to discuss this proposal which keeps popping up. LANL's problem is that they have an accelerator design division trying to find something to do.

A simple analysis follows:

2 Gev accelerator with beam of 250 milliamperes

1 ampere of protons = 6×10^{18} protons/sec

1 ampere year = $6 \times 10^{18} \times 60 \times 60 \times 24 \times 365 = 1.89 \times 10^{26}$ protons/year

Assume 50 neutrons/proton = $50 \times 1.89 \times 10^{26} = 9.45 \times 10^{27}$ neutrons/year

Assume 50% conversion of neutrons to T = 4.7×10^{27} T's/year

(Dick Burick (LANL) assumes 80% conversion)

3 gms of T = 6×10^{23} T's

1 gm T = 2×10^{23} T's

$\frac{4.7 \times 10^{27}}{2 \times 10^{23}} = 2.35 \times 10^4$ gms T/year = 23.5 Kg T/year ampere

At 250 milliamperes = 1/4 ampere = 5.875 Kg T/year at 365 days operation

Assume 80% of year at full current of 250 milliamperes

$0.8 \times 5.875 = 4.75$ Kg T/year (80% neutron conversion get 7.5 Kg/year)

So if the accelerator runs 80% of the time at full power with 50% conversion of neutrons to tritium and one achieves 50 neutrons per 2 Gev proton one makes 4.7 Kg T/year. Because of decay the quantity will be less.

250 milliamperes @ 2 Gev = 500 megawatts in the beam. Assume 40% conversion of wall power to beam then one needs 1250 Megawatts of power. (note LAMPF at best converts wall power to beam with 7% efficiency).

A 350 megawatt thermal MHTGR produces 150 Megawatts of electricity and can provide 1.25 Kg of T. Two such reactors produce 2.5 Kg of T and 300 megawatts of electricity. If sold at 50 mills/kw revenue pays for operations per year and after 30 years will pay for total plant cost.

Maybe compromise is four MHTGRs producing 5 Kg T year and providing 600 megawatts of power to feed the accelerator plus accelerator buying another 625 megawatts from someone.

8 MHTGRs make 1200 megawatts of power plus make 10 Kg of T.

Accelerator consumes 1250 megawatts of power and makes 4.7 - 7.5 Kg of T. How can anyone take this seriously?

I have no doubts that within a factor of two the claims for the accelerator can be built and operated. (Won't cost more than twice routed price and won't produce less than half the amount of tritium claimed). But it's really a dumb idea compared to a power producing reactor.

And besides one or two inherently safe HTGRs will take care of our anticipated needs and provide a prototype for a second generation nuclear power system for electricity and process heat. Being inherently safe it could be located at industrial sites (no evacuation zone required). Being small it would be factory manufactured and shipped to the site. It also could be a great export item for the U.S. because it wouldn't need a gaggle of nuclear engineers to operate it.

When you are at GA in January you might wish to have the GA people give your panel an update on the MHTGR proposal for the new production reactor at Savannah River.

If I can be of any help in your deliberations, please let me know.

Happy holiday,

Harold

cc: Will Happer

*Allen,
Thanks again for lunch + being able
to meet your boss.*

Anna

"Document Control"

TYPE: ACTION-MEETING DOCUMENT NUMBER: 9125167
ORIGINATOR: 02 STATUS I DIRECTORATE STATUS

FROM: MORRISON, David: AMES RESEARCH CENTER

TO: DR. D.A. BROMLEY

DEC 20 1991

DATE OF CORRESPONDENCE: 12/12/91

SUBJECT: RE: GLOBAL ASTEROID IMPACT HAZARD; HE IS READY TO PROVIDE ANY INFORMATION ON THE ASTEROID IMPACT HAZARD OR THE PROPOSED INTERNATIONAL ASTEROID DETECTION PROGRAM.

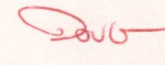
DIRECTORATE STAFF
ASSIGNED: PHYSICAL SCIENCES ASSIGNED:

ACTION STAFF
REQUIRED: AS NECESSARY ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: 12/31/91 STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT: 1/31/92

COPIES TO: D. Allan Bromley

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

*I called Dr Morrison and he will call me before he comes to D.C. ~ 31 Jan 92.
Dr. Ed. Beazley met w/ him on 1/31 @ 9:00. *

OSTP RECEIVED: 12/19/91 DEPT RECEIVED:
FILE: P-PHYSICAL SCIENCES

CENTRAL FILES:



National Aeronautics and
Space Administration

Ames Research Center
Moffett Field, California 94035

5167A
NASA

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91 DEC 19 A10: 21

12 December 1991

OSTP
MAIL ROOM

Reply to Attn of: SS:245-1

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

Dear Dr. Bromley:

Thank you for your letter of 3 December on the subject of the global asteroid impact hazard and the possibility of asteroid detection being on the agenda for discussion between President Bush and Australian Prime Minister Hawke. As you suggested in your letter, I phoned Karl Erb to see if I could contact him on my trip last week to Washington. Unfortunately he, like you, was not in Washington on the same dates I was there.

I stand ready to provide you any information on the asteroid impact hazard or the proposed international asteroid detection program if these are needed for the President's briefing book or any other purpose. Please let me know if there is anything I can do. And even if there is no urgent requirement, I do hope to have the opportunity to brief you or your staff on the contents of our report sometime in the not too distant future.

Sincerely,



David Morrison, Chair
NASA International Near-Earth Asteroid Detection Workshop

"Document Control"

TYPE: ACTION DOCUMENT NUMBER: 9125137
ORIGINATOR: 02 STATUS I DIRECTORATE STATUS

FROM: GOVE H.E.: UNIVERSITY OF ROCHESTER

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 12/11/91

SUBJECT: HE REQUESTS DR. BROMLEY'S ADVICE ON FUNDING SOURCES
FOR THE UNIVERSITY'S AMS PROGRAM.

DIRECTORATE STAFF
ASSIGNED: PHYSICAL SCIENCES ASSIGNED:

ACTION STAFF
REQUIRED: FOR DAB'S SIGNATURE ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: 12/31/91 STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
ENVIRONMENT

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

CLOSED

OSTP RECEIVED: 12/17/91 DEPT RECEIVED:
FILE: P-PHYSICAL SCIENCES
CENTRAL FILES:

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
04. Letter	To: Allan Bromley From: H.E. Gove Re: Cleanup at Savannah River facilities (2 pp.)	12/11/91	(b)(1)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: General Science Files
WHORM Cat.:
File Location: Physical Science: General [1 of 8] [1991]

Date Closed: 3/17/2010	OA/ID Number: 62041-001
FOIA/SYS Case #: 2005-0336-F	Appeal Case #:
Re-review Case #:	Appeal Disposition:
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AR Case #:	MR Case #:
AR Disposition:	MR Disposition:
AR Disposition Date:	MR Disposition Date:

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

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

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THE WHITE HOUSE

WASHINGTON

December 19, 1991

Dear Harry:

My exceedingly efficient mail handling system got a copy of your letter of December 11 to Karl Erb before mine arrived and when I called Karl to compare notes on possible funding sources for you, I learned that he had already dictated a reply. We are not usually that efficient but clearly both of us do appreciate the importance of the work that you are doing with respect to the AMS activities at the NSRL and believe strongly that this particular kind of work deserves to be well-funded because of its importance in programs of such magnitude that your expenses are not only lost in roundoff, but completely gone beyond the capacity of any of our local computers in terms of significant digits!

As Karl has suggested, both Will Happer, the new Director of the Office of Energy Research at DOE, and Erich Bretthauer, the Assistant Administrator for Science at EPA, will understand the importance of what you are doing and in the very unlikely event that they fail to do this, Karl and I will make sure that their education is expanded appropriately. What you need is a relatively brief proposal statement that spells out the importance of these measurements for the programs for which Happer and Bretthauer are responsible.

It was good to be back at Rochester, and I was very much impressed by what Liz Thorndike has been able to accomplish in her Center for Environmental Information. Unfortunately, my schedule tightened up at both ends just shortly before I took off for Rochester, so I was unable to participate in a number of the events that Liz had arranged for earlier in the first evening, and during the following morning.

Please keep us in touch so that we can be sure that your work continues and in the meantime, warmest wishes for a merry Christmas and a happy, healthy and rewarding 1992 to both you and Shirley.

Sincerely yours,



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

Professor H. E. Gove
Nuclear Structure Research Laboratory
University of Rochester
Rochester, New York 14627

"Document Control"

TYPE: INFORMATION

DOCUMENT NUMBER: 9125098

ORIGINATOR: 02

STATUS C

DIRECTORATE STATUS

FROM: WYNNE, James J.: IBM CORPORATION (AMERICAN PHYSICAL SOCIETY)

TO: DR. D.A. BROMLEY

DATE OF CORRESPONDENCE: 12/04/91

SUBJECT: HE IS FORAWRDING A COPY OF HIS INVITATION TO PRESIDENT BUSH TO SPEAK TO THE MEMBERSHIP OF THE AMERICAN PHYSICAL SOCIETY DURING ITS MEETING IN MARCH 1992.

DIRECTORATE ASSIGNED:

STAFF ASSIGNED:

ACTION REQUIRED:

STAFF ACTION:

SENDER'S DUE DATE:

OSTP DUE DATE: DATE COMPLETED:

STAFF DUE DATE DATE COMPLETED/DEPT:

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

WHITE HOUSE TRACKING #:

CONTACT PERSON: PHONE:

EXT:

REMARKS:

OSTP RECEIVED: 12/13/91 FILE: P-PHYSICAL SCIENCES

DEPT RECEIVED:

CENTRAL FILES:

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IBM

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International Business Machines Corporation
Research Division

James J. Wynne, Rm. 26-118
IBM T. J. Watson Research Center
Yorktown Heights, NY 10598-0218

PHONE: (914) 945-1575/FAX: (914) 945-3715
BITNET: ARMY AT WATSON
INTERNET: ARMY at WATSON.IBM.COM

December 4, 1991

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

Dear President Bush,

We are renewing our invitation to you to present an address on education to the membership of the American Physical Society (APS) during its meeting from March 16-19, 1992, in Indianapolis, IN. (In response to my earlier letter of invitation, dated August 14 (copy attached), Katherine Super, your Deputy Assistant for Appointments and Scheduling, replied on August 26 (copy attached) that we should go ahead with our program and renew this invitation at a later date.) For this meeting, our Committee on Education has now put together a special symposium entitled "Advice to President Bush from Presidential Awardees," featuring the following talks (abstracts attached) by high school physics teachers who have been the recipients of Presidential Awards for Excellence in Science Teaching:

- "Science Education Reform: Is it Seeing or Believing?" Carol-Ann W. Tripp, Providence Country Day School, Providence, Rhode Island
- "Bright Students: A National Resource in Need of Resources," Arthur Eisenkraft, Fox Lane High School, Bedford, New York
- "Addressing a National Problem with the AAPT Physics Teaching Resource Agents Program," James Nelson, Orange County Public Schools, Orlando, Florida

The three speakers are all teachers who have achieved national prominence. Dr. Eisenkraft has, in fact, just been selected as Outstanding Science Teacher for 1991 during the American Teacher Awards event, sponsored by Walt Disney, Coca Cola, and American Airlines. Our APS symposium is a unique opportunity for you to address the nation's professional research physicists on your education agenda. Your presence will surely reinforce the message that all of us must support our teachers, the first line of offense in raising our educational standards.

Repeating what I wrote in my earlier letter, the APS, with a membership in excess of 42,000, has as its goal the advancement and diffusion of the knowledge of physics. To achieve this goal, the APS holds meetings, publishes journals, considers public issues such as nuclear materials proliferation, global warming, and biomedical hazards from low frequency electromagnetic fields, deals with human rights and minority issues in physics, and has an active program concerned with physics education. The APS March meeting is the leading international meeting in condensed matter physics, with a regular attendance in excess of 5,000. If you are able to address us, you can be assured of a large and influential audience.

For now, we have scheduled this special session for 4:30 - 6 pm on Monday, March 16. If you accept our invitation to speak but find this time and/or date inconvenient, we will reschedule the session to meet your needs. We can accommodate you any time, including evenings, between Monday, March 16 and Thursday, March 19. Please let us know of your availability as soon as possible, so that we can handle the logistics of any changes we have to make, including bringing the high school teachers to Indianapolis on another date. Should you accept our invitation but are unable to attend because of unplanned, last-minute demands on your time, we would welcome your science advisor, Allan Bromley, a physicist and a Fellow of our society, as the best person to appear in your behalf.

Sincerely yours,

ORIGINAL SIGNED BY.

James J. Wynne, Ph. D.
Chair, Committee on Education, American Physical Society

Attachments

cc: D. Allan Bromley, Assistant to the President for Science and Technology, The White House
Nicolaas Bloembergen, President, American Physical Society
Ernest M. Henley, President-Elect, American Physical Society
N. Richard Werthamer, Executive Secretary, American Physical Society

P. S. I enclose a reprint of a recent article which appeared in Physics Today (circulation 110,000) coauthored by Brian Schwartz, APS Education Officer, and myself, describing some of the activities carried out by the research community in support of pre-college science and mathematics education.

August 14, 1991

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

Dear President Bush,

We invite you to present an address on education to the membership of the American Physical Society during its meeting from March 16-19, 1992, in Indianapolis, IN, right in the heartland of America. For this meeting, our Committee on Education is putting together a special session on education, tentatively entitled " Outstanding High School Teachers: The Presidential Awardee Session." It seems especially appropriate to couple you with outstanding teachers, since one of the focal areas of your education agenda, "America 2000," is recognition and professional development of teachers, especially in science and mathematics. We offer you this opportunity to address the nation's professional research physicists on your education agenda, and to share the stage with several of our most outstanding educators, high school teachers who have received Presidential Awards. The message to the audience of physicists will be that all of us must support our teachers, the first line of offense in raising our educational standards, and that we especially honor and recognize the efforts of our outstanding teachers.

In the way of background, the American Physical Society, with a membership in excess of 42,000, has as its goal the advancement and diffusion of the knowledge of physics. To achieve this goal, the APS holds meetings, publishes journals, considers public issues such as nuclear materials proliferation, global warming, and biomedical hazards from low frequency electromagnetic fields, deals with human rights and minority issues in physics, and has an active program concerned with physics education. The March meeting is our largest meeting and is the leading internationally recognized meeting in condensed matter physics, with a regular attendance in excess of 5,000. If you are able to address us, you can be assured of a large and influential audience.

President George Bush
Page 2
August 14, 1991

For our planning purposes, we need to know by December 1, 1991, whether you are able to accept our invitation. Should you accept but are unable to attend because of unplanned demands on your time, we suggest that your science advisor, Allan Bromley, a physicist and a Fellow of our society, would be the best person to appear in your behalf. We look forward to your early response.

Sincerely yours,

ORIGINAL SIGNED BY

James J. Wynne, Ph. D.
Chair, Committee on Education, American Physical Society

cc: D. Allan Bromley
Nicolaas Bloembergen, President, American Physical Society
Ernest M. Henley, President-Elect, American Physical Society
N. Richard Werthamer, Executive Secretary, American Physical Society

bcc: Brian B. Schwartz, American Physical Society

P.S. for Dr. Bromley: For planning, coordination, and announcement purposes, we would prefer to schedule this education session for 4-6 pm, on either Monday, March 16 or Tuesday, March 17. We would announce it in the APS Bulletin and make arrangements to have the Presidential Awardee teachers attend the meeting on those days. If the President accepts our invitation with the understanding that you will be his stand-in if he cannot attend, please let us know which day, Monday or Tuesday, to pick for the announcement. Of course, if the President is able to attend but only at a different time and/or on a different day, we will change the plans to accommodate his schedule.

THE WHITE HOUSE

WASHINGTON

August 26, 1991

Dear Dr. Wynne:

Thank you for your invitation for the President to address the membership of the American Physical Society on Education at its meeting on March 16-19, 1992.

We appreciate your extending this opportunity. We hope you will understand we are unable to make a commitment for the President this far in advance. In order not to delay your planning, we suggest you proceed with your program not counting on his acceptance. If you wish, you may then feel free to renew your invitation closer to the date -- perhaps ten to twelve weeks in advance -- for consideration at that time.

With best wishes,

Sincerely,



KATHERINE L. SUPER
Deputy Assistant to the President
for Appointments and Scheduling

Dr. James J. Wynne
International Business Machines
Corporation
Thomas J. Watson Research Center
Post Office Box 218
Yorktown Heights, NY 10598

Abstract of Invited Talk
for the 1992 March Meeting
16-20 March 1991

Session Title:

SYMPOSIUM OF THE COMMITTEE ON EDUCATION:
ADVICE TO PRESIDENT BUSH FROM PRESIDENTIAL AWARDEES

Science Education Reform: Is It Seeing or Believing? CAROL-ANN W. TRIPP, Providence Country Day School, RI

It is unlikely that even a small hometown newspaper fails to carry an article in its daily edition either faulting or commending educational reform. The topic is a hot item. Many sectors of our society, from research scientists to businessmen, are lending their voice and support to the issues. While all this much needed attention and long overdue concern means we have taken an important first step, are we in education once again doing things for the right reason but in the wrong way? The reformers - the politicians, scientists, and educators - sincerely believe in the potential for improvement in their programs. It is, however, the classroom teacher who confronts, and ultimately controls, the reality of success with such programs. Two very valid questions are: How realistic is it to expect success, to expect classroom teachers to concentrate on professional goals, when there are forces undermining their personal confidence, such as funding cuts, salary cuts, staff cuts, schools closing? Are we jeopardizing end results in not attending to fundamental assumptions - assumptions that we will be able to support implementation? If we need to believe in the future success of long-range reform goals, then we also must see the present-day threats to the accomplishments of these goals. Without a fully cooperative and well-sequenced effort that starts from the classrooms to the commissioners and involves teachers, scientists and politicians functioning in a trusting partnership, the educational product cannot be a quality one.

Abstract of Invited Talk
for the 1992 March Meeting
16-20 March 1991

Session Title:

SYMPOSIUM OF THE COMMITTEE ON EDUCATION:
ADVICE TO PRESIDENT BUSH FROM PRESIDENTIAL AWARDEES

Bright Students: A National Resource in Need of Resources. ARTHUR EISENKRAFT, Fox Lane High School, Bedford, NY

Much of the public attention is devoted to improving science education for the vast number of students who are achieving below our expectations, as it should be. Bright students, however, are also in need of assistance. These students often find themselves alone in their schools. Few of their friends have their talent, desire to learn, or growth potential. Few of these students know that their skills are valued by the society. We should be exploring means by which we can encourage these proficient students to achieve as much as they are capable of achieving. We must institute a reward system which encourages students to want to join this special group of young scholars.

Abstract of Invited Talk
for the 1992 March Meeting
16-20 March 1991

Session Title:

SYMPOSIUM OF THE COMMITTEE ON EDUCATION:
ADVICE TO PRESIDENT BUSH FROM PRESIDENTIAL AWARDEES

Addressing a National Problem with the AAPT Physics Teaching Resource Agents Program. JIM NELSON, Orange County Public Schools, Orlando, FL

The problem we have come to call scientific and mathematical illiteracy is and will continue to produce repercussions for many years, unless we address it promptly. The problem has been attacked in many states by increasing the high school graduation requirements in science and mathematics. Unfortunately, this solution is at risk. There is currently an insufficient number of qualified science teachers to teach these new classes, and a source of new teachers is not immediately identifiable. The problems associated with the teaching of physics in pre-college setting is even more acute than in other areas of science. This is particularly alarming because physics is the most basic science and is a subject where students have an opportunity to use the mathematical tools they are learning. The American Association of Physics Teachers (AAPT) "Physics Teaching Resource Agents" program represents a major effort to address this problem.

PHYSICS TODAY

SEPTEMBER 1991



SPECIAL ISSUE:
PRE-COLLEGE EDUCATION

PRE-COLLEGE PHYSICS EDUCATION PROGRAMS FROM THE RESEARCH COMMUNITY

Brian B. Schwartz
and James J. Wynne

PRE-COLLEGE PHYSICS EDUCATION PROGRAMS FROM THE RESEARCH COMMUNITY

Physicists from the professional societies, the national laboratories and industry run many active programs for teachers and students of pre-college physics.

Brian B. Schwartz
and James J. Wynne

With the 1980s came the recognition that a crisis is developing in American education and in science and mathematics education in particular.¹⁻³ Thus one goal coming out of President Bush's 1989 Education Summit is that "US students will be first in the world in science and mathematics"⁴ by the year 2000. Here we consider the response of three sectors of the physics research community—the professional scientific societies, the national laboratories (see figure 1) and industry—and survey the programs they offer for pre-college students and teachers. There are too many such programs for our treatment to be comprehensive and so we have chosen a representative selection. These same organizations also have many projects that deal with curriculum reform and teaching materials, as Gerhard Salinger discusses in his article on page 39. The box on page 50 summarizes the activities open to the individual researcher.

Teacher's Days at society meetings

Among the earliest responses to the crisis in science education were the establishment of teacher's days at the research meetings of many physics-related societies. These programs vary somewhat in format, size and cost, but they all have a common strategy: taking advantage of the professional society's research meeting to put on special programs and events that recognize and honor the efforts of high school physics teachers and that provide an opportunity for them to meet one another and form ongoing relationships. The Optical Society of America led the way with its first Educator's Day at its 1985 annual meeting (see PHYSICS TODAY, October 1985, page 104).

The OSA Educator's Day includes lectures on optical phenomena, workshops on demonstrations that could be used in schools, and attendance of other parts of the meeting (see figure 2). The expenses for travel, lodging and substitute teachers for those participating are included in the OSA budget. This year, OSA celebrates its 75th anniversary and is planning a special two-day event during its annual meeting in San Jose. In addition to the 60 teachers from the San Francisco Bay area, one high school teacher from each state, the District of Columbia, and Puerto Rico will be invited to attend. To operate the program, OSA makes use of volunteer lecturers from its membership, and also solicits outside corporate support. A typical Educator's Day costs about \$50 000. The success of the OSA program is suggested by the number of other societies that have followed its lead (see figure 3).

For the past four years, APS has operated High School

Brian Schwartz is the associate executive secretary of The American Physical Society and a professor of physics at Brooklyn College of the City University of New York. **James Wynne** is a researcher at the IBM Thomas J. Watson Research Center, in Yorktown Heights, New York and is currently chair of the committee on education of APS.



The Teacher Research

Associates Program gives high school teachers the opportunity to work for eight weeks at one of the DOE's 21 national laboratories. Here, Paul Johnson, a teacher from Alaska, studies a position-sensing photo detector while in the TRAC program at Fermilab. **Figure 1**

Teacher's Day. This is limited to a single day and the \$5000 cost per program is covered entirely by APS. Each program includes a luncheon at which high school teachers meet and interact informally with researchers at an APS meeting. Five High School Teacher's Days are planned for the coming academic year. An important feature is the early involvement of local high school teachers (often physics teaching resource agents, as described below) in the planning, which ensures that the program is suited to the needs and problems of the local community (see *PHYSICS TODAY*, May 1989, page 89).

The American Astronomical Society organizes the very successful Astronomer for a Day programs, which usually introduce local high school teachers to regional astronomy resources. Often workshops are held on astronomy projects and materials that can be used in the classroom. The American Vacuum Society has also developed a workshop for high school teachers (see *PHYSICS TODAY*, September 1990, page 100) and the American Association of Physicists in Medicine has held two Educator's Days.

The physics community should actively export this concept to all the professional science societies. If each society included such programs at some of its scientific meetings, the result would be significant high quality science training and teacher recognition throughout the nation at relatively little cost.

Students (and their teachers) attend AIP member society meetings through Project SEEP (Students to Explore and Experience Physics), which aims to heighten middle school minority students' interest in science. Project SEEP features speakers and physics demonstrations for the students and their teachers (see figure 4), after which students are given the opportunity to perform supervised physics experiments. (See *PHYSICS TODAY*, May 1989, page 67.) AIP covers the \$4000-5000 cost of each program.

Workshops and teacher training

AAPT's Physics Teaching Resource Agents program was funded by NSF to develop a cadre of outstanding high school physics teachers to conduct workshops for under-



Teachers at OSA's 1990 Educators' Day touring the OPTCON '90 exhibition. **Figure 2**

prepared physics teachers.⁵ Under the direction of Donald Kirwan (1985–86) and John Layman (1987–88), and codirected by Jack Wilson, the AAPT executive officer during this period, the PTRAs program selected a total of 350 physics teachers to participate in three-week leadership training programs and in follow-up seminars at AAPT meetings. The PTRAs form a human resource group within the nationwide community of high school physics teachers and continue to play an important role in improving physics teaching in high schools. They also have lent their expertise to other educational outreach efforts and have often facilitated interactions between high schools and the research community. (See the article by Yvette A. Van Hise and Jim Nelson in *PHYSICS TODAY*, March 1988, page 47.)

A major effort aimed at improving high school teaching is the Local Physics Alliance program operated by APS and supported by two NSF grants totalling \$567 000 with John Russell (Southeastern Massachusetts University) and Brian Schwartz as principal investigators. This program promotes the development of regional alliances between high school physics teachers and college physics faculty. Many high schools have only one teacher of physics (sometimes only part time) and thus there is no opportunity for the teacher to share ideas and teaching techniques.

A typical Local Physics Alliance workshop is held on a Friday evening and Saturday. All teachers of physics within about 200 miles of the workshop are invited, with room, board and travel expenses paid. Usually, 80 to 120

Activities Open To The Individual Researcher

- ▷ Participate in the science education outreach activities of your professional society.
- ▷ Organize student and teacher visits to your laboratory.
- ▷ Prepare informative lectures at the appropriate level for teachers. Include hand-out notes and materials that the teachers can easily use as viewgraphs.
- ▷ Lend equipment and provide materials and supplies to teachers to enhance their classroom demonstrations.
- ▷ Provide teachers with support such as meeting rooms, access to copying facilities, and so on.
- ▷ Actively participate in a physics alliance in your area.

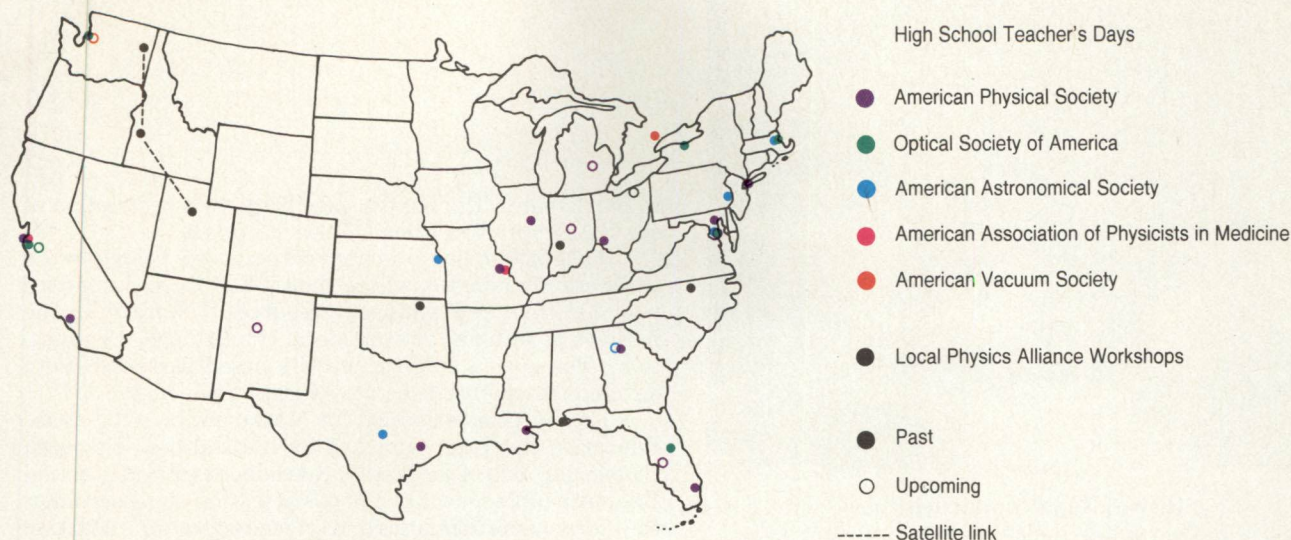
teachers attend with about 60% from high schools and 40% from colleges. The workshop begins with a welcoming buffet and an evening of entertaining and informative physics demonstrations. The next day, lectures on the concept of local alliances are given by experienced high school and college educators from successful operating physics alliances. The attendees are then divided into regional groups to discuss how a local alliance might address the educational problems and needs of their region (see figure 5). The regional groups take the first steps toward organizing a local alliance planning meeting in their region.

To date, five workshops have been held. Nearly 100 physics alliances have been initiated or assisted. Local high school teachers and local college faculty member volunteers convene the workshop, while APS provides staff support for operating the meeting and assists in the program planning. The joint AAPT-APS College-High School Interaction Committee has also been instrumental in the program.⁶ (See *PHYSICS TODAY*, November 1988, page 139, and October 1987, page 107.)

A series of workshops for teachers has been developed and validated by AIP's nationwide program Operation Physics under Kirwan's direction. The workshops focus on the physics content typical of 4th–8th grade science curricula, hands-on activities that require only inexpensive and readily available materials and that are appropriate for younger students, discussions of the ideas that children bring to the classroom, and teaching methods that reflect recent research on learning theory (see Jose P. Mestre's article on page 56). Leadership teams assembled from university physics and science education faculty, high school physics teachers and teachers from the targeted grade levels are being trained throughout the country to conduct the workshops with teachers from their local areas. To date, about 55 000 teachers have participated in Operation Physics workshops, and almost 5000 teachers have completed Operation Physics courses for graduate credit at 43 colleges and universities. The total cost has been about \$2.4 million, with major funding from NSF, AIP, state and local education agencies and private corporations. NSF funding has been sought for a proposed program with AAPT to use Operation Physics in the pre-service training of elementary and middle school teachers, following the precept that teachers should be taught in the way that they are expected to teach.

APS Forum on Education

The 1930 decision to form an organization (AAPT) separate from APS to address the problems of physics education has, in our opinion, complicated the opportunities for all members of the professional physics community



Locations of professional society programs for high school teachers held over the last five years and to be held in the upcoming academic year. **Figure 3**

to respond to educational challenges over the years. Recently, APS, after working through its Committee on Education with a special task force of AAPT, approved the establishment of a Forum on Education. Forum membership is free for APS members.⁷ The purpose of the Forum is to promote two-way communication between the physics research and the physics education communities. It will focus attention on the importance of good and universally available education to the health of physics research.

It is hoped that the new Forum will develop like the very successful Forum on Physics and Society, and will give APS members a voice and opportunities for action in physics education. Strong links are written into the Forum bylaws, ensuring close cooperation between the new Forum and AAPT. In our opinion all of the AIP member societies should consider creating a subunit for members working with AAPT.

National laboratory programs

In October 1989, Secretary of Energy James D. Watkins convened a major conference to define the role of the national laboratories in science education.⁸ He was especially interested in having the laboratories share their ideas and coordinate their educational programs, both with one other and with other organizations such as businesses, universities, school districts and so on. Watkins made a specific request that each laboratory (and each scientist within the laboratory) devote a fraction of its budget and time to science education. The conference report asked DOE laboratories and facilities to open their doors to schools and communities and develop model student and teacher programs for the entire Federal government.

It is inappropriate to detail all the programs of the national laboratories⁹ here, and we will only briefly mention some of the pre-college programs of Fermilab and Lawrence Livermore National Laboratory.

When Leon M. Lederman was director of Fermilab he encouraged the high-energy physics community to develop programs for pre-college teachers and students using modern high-energy physics as the theme. In 1979, Fermilab began offering Saturday Morning Physics to high school students. There are three sessions per year, each with about a hundred students (mostly seniors) attending a series of ten classes including lectures,

discussion sessions and lab tours given by physicists.

Another program is the three-week Summer Institute for Chicago Science and Mathematics Teachers held in collaboration with Chicago State University, which has sessions in high school biology, chemistry, physics and mathematics. In the physics program, 15 teachers attend morning lectures on topics such as the Fermilab neutron therapy facility and afternoon laboratory sessions to translate those topics to the high school classroom. Follow-up sessions are held during the academic year and participants receive a stipend and can earn graduate credit for completing the program. The program is based on a similar four-week summer institute conducted since 1983 at Fermilab for teachers drawn from a wider area. However, this original institute did not receive funding from NSF in 1991.

The DOE Office of Energy Research funds the Teacher Research Associates Program (TRAC) at many laboratories, in which teachers (10 at Fermilab) work with a scientist or engineer on a research project for one summer (see figure 1). Participants learn to acquire data and report results in a scientifically acceptable manner, skills directly transferable to the classroom. Individual physicists and departments at Fermilab have funded an extension of the program that allows 16 "TRAC Grad" teachers to return for additional summers, which are often much more productive because of the teachers' earlier experience.

Fermilab has a variety of other programs for both teachers and students at the elementary and secondary school levels. Some are mentioned in Salinger's article on educational materials (page 39) and in *PHYSICS TODAY*, May 1991, page 53, and October 1990, page 85. Pre-college programs at Fermilab also receive support from the non-profit Friends of Fermilab organization.

Lawrence Livermore National Laboratory opened a Science Education Center in 1983. It has since become the model for similar facilities at other laboratories. In the past several years, the center has offered summer workshops for several hundred teachers. Scientists and technicians from Livermore instruct the teachers in basic science, computers, global climate issues and multimedia techniques, and help them develop new science curricula.

At Livermore, staff members from the inertial confinement fusion program and the Science Education



High- T_c superconductivity demonstrated to junior high school students by Brian Schwartz as part of the SEEP program at the November 1990 APS meeting in Cincinnati, Ohio. **Figure 4**

Center have developed a program for teaching the science of fusion. The project, Fusion Energy: Meeting the Challenge, has developed instructional materials and strategies, which have been widely disseminated through workshops for teachers and visits to classrooms. Initially for high school science teachers and students, the program is to be expanded to the middle and elementary school levels. The research community should be involved in development of such materials for high school teachers in all the subdisciplines of physics.

Industry and business

Science and mathematics education in grades K-12 directly affects the ability of American industry to meet the challenge from international business. Jobs of the future will require greater technical and mathematical literacy than did jobs of the past. Many American industries are committed to helping educators prepare students to fill those jobs. Here we present a few representative examples to give a flavor for how some companies are already participating and to provide suggestions for other companies that are looking for ways

to participate. The box on page 53 gives a description of the IBM Local Education Outreach program.

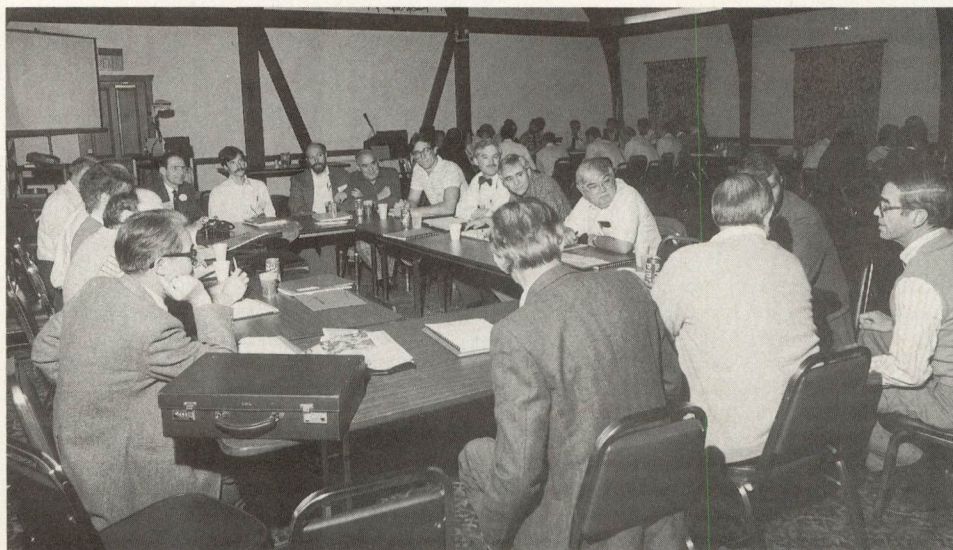
Some 200 major US-based corporations belong to the Business Roundtable, where their CEOs have committed personal time and company resources to work with the nation's governors for systematic change in K-12 education. The goal is to form broadly based partnerships to develop reform-minded state education policies.

The Corporate Council for Mathematics and Science Education has been launched by the National Research Council (an arm of the National Academies of Sciences and Engineering), to focus business's attention on a coordinated reform of mathematics and science education. Starting from national standards developed by the mathematical sciences educational communities, the Corporate Council will develop national strategies, create national support structures and serve as an information network. It will help corporations articulate their current and future needs for workers with scientific understanding and skills, and will convey these needs to education administrators, curriculum developers and teachers. It will produce and disseminate materials on successful education and training programs, and provide materials for local forums and workshops.

Summer jobs and academies for teachers

Industry has widely adopted the summer employment of high school science and mathematics teachers. Teachers who are brought into lab environments during the summer update their skills, increase their knowledge of emerging technologies and potential careers for their students, develop new instructional materials and teaching strategies, increase their self-confidence and renew their enthusiasm for teaching.

Their students get direct access to industry through tours, opportunities to use new equipment and materials, and classroom visits by industry scientists. Furthermore, the students receive more relevant and effective instruction from their teachers. But the benefits are not all one way. Teachers are valuable summer employees who bring



A regional group discussion among high school and college participants at the Spencer, Indiana, Local Physics Alliance Workshop held in November 1988. **Figure 5**

IBM's Local Education Outreach Program

The LEO program is designed to marshal the resources of the IBM Thomas J. Watson Research Center to enhance science and mathematics education in our local school system. These resources include our employees, our physical resources (building, laboratories, equipment) and a modest amount of money to support specific programs. Any research institute of reasonable size can develop an effective program aimed at the same goal. This summary is intended to serve as a recipe that can be varied to suit the taste, interest and resources of the institution that decides to create such a program.

The IBM LEO program began in 1988 with the decision to present cash awards to graduating seniors who excelled at science and mathematics at several local high schools. In 1990, the program was expanded to develop partnerships between the Research Center and selected local districts, each partnership being broad and deep enough to persuade the school districts to give them attention and support.

Teacher development. IBM offers a lecture series for high school science and mathematics teachers entitled "The Personal Computer: How it Works and How it is Used." Participants from the partner high schools attend 20 hours of lectures and discussions spread out over eight lecture periods. Subject matter includes computer applications, computer science, physical science, mathematics, technology and biological science. The teachers get a taste of the excitement that comes from working at the frontiers of technology and receive specific knowledge and materials for use with their students. Topics with a strong component of physics include the use of magnetism and magnetic fields in disc drives, motors and other electromagnetic devices; materials processing for semiconductor chip fabrication; and condensed matter physics, including how a transistor works. The subject matter was selected during planning discussions with teacher advisory groups containing at least one teacher from each high school.

Summer jobs. The LEO program provides summer jobs for qualified high school teachers and students. The concept of offering summer jobs to high school teachers grew out of a program initiated by APS for finding summer jobs in research laboratories for high school physics teachers. Inspired by the Industry Initiatives for Science and Math Education program (see main text, this page), IBM supported the efforts of Carlo Parravano, the director of the Center for Mathematics and Science Education at the State University of New York at Purchase to develop the Research Opportunities for High School Teachers Program. SUNY Purchase acts as a matchmaker, and qualified teachers are put in touch with

local research and development laboratories that might want to hire them. Over the past three summers, IBM has hired nine teachers through this program, most of them physics teachers who worked as physics laboratory assistants.

Qualified students capable of providing help as programmers and physics and chemistry laboratory assistants are also hired during the summer. The students get a taste of scientific research and are better able to judge whether or not to seek a career in a technical area.

Student recognition and enrichment. We continue to present scholastic achievement awards. To provide incentive to more students, IBM has a monthly science and math student recognition luncheon. Each month, the partner high schools select a science student and a math student of the month. The selection criteria vary, but include excellence in normal classroom activities, tutoring other students, marked improvement in performance, and unusual creativity. The students are invited to the Research Center where they receive personalized certificates and meet students from other high schools with similar interests. We also ask the schools to send a science teacher and a math teacher. Both the students and teachers are taken on laboratory tours and become more aware of challenging career opportunities. A typical tour guide is one of our PhD scientists, engineers or mathematicians. A recognition luncheon is something that any research institution can easily implement in partnership with local high schools.

LEO also promotes and supports face-to-face competition between science and math teams from neighboring high schools. These not only heighten students' interest in science and math, but serve to enhance the peer recognition that high achieving students receive, because they are representing their schools in teams rather than representing themselves as individuals.

Other aspects of the LEO program include purchasing high- T_c superconductivity kits for high school physics classrooms, loaning equipment to teachers for short-term use in demonstrations or student research projects, providing IBM speakers for classrooms (see figure 6), hosting laboratory tours for selected groups of students, and offering hands-on science workshops for elementary school students at our Research Center (see cover photo).

This cross section of activities was selected based on the expressed needs and interests of the teachers and administrators at our local schools and matched with the interests of our IBM volunteers. Other institutions that plan to organize education outreach programs are well advised to talk to the schools before putting any programs into place. —JJW

to their summer assignments maturity, initiative, dedication, enthusiasm, good communication skills and a well-organized approach that can help accomplish specific technical tasks and infuse new perspectives and ideas. Hiring companies also get community recognition and improve employee morale by making distinct contributions to local education. Representative companies are AT&T, General Electric, Hewlett-Packard, Dupont, Intel, Apple Computer, Lockheed, General Foods, Lederle Labs and IBM.

While individual companies may develop their own direct links to employable teachers, a collection of companies in the San Francisco Bay area have formed a partnership with the Lawrence Hall of Science at the University of California, Berkeley, which has full-time administrative staff who match qualified teachers with companies and laboratories. This partnership is known as

the Industry Initiatives for Science and Math Education.¹⁰

In the first six years of IISME's existence, business and government laboratories in the Bay Area have offered over 400 summer job fellowships to teachers. These teachers represent one tenth of the Bay Area high school science and mathematics teaching force, demonstrating that a consistent, long-term effort can reach a substantial part of the relevant population of educators. IISME's sponsors include Amdahl, Chevron, Dow Chemical, GTE, IBM, Lawrence Livermore National Laboratory, Northern Telecom, Pacific Bell, Raytheon and Unisys, among a total of 57 business and government laboratory partners.

Many companies have formed summer academies where teachers attend one- or two-week sessions to increase their knowledge in math, science and technology, learn strategies for teaching these subjects more effectively and explore how to integrate them into the total school



IBM

The "buckyball"—the soccer-ball-like structure of the recently discovered C_{60} form of carbon—is explained by James Wynne to 7th grade students at P.S. 56 in New York City as a part of the LEO program. **Figure 6**

curriculum.

AT&T Bell Laboratories works with the New Jersey Science Teachers Association to offer a program called Science Teachers in Industry, in which groups of teachers are brought to Bell Labs for a two-week workshop featuring a wide variety of lab visits and actual in-lab work with individual scientists.

Cray Research in Chippewa Falls, Wisconsin, supports the Cray Academy which offers one-week workshops for elementary, middle school and high school educators. Instructors include Cray technical specialists and master teachers from schools and universities. Topics include "How to Grow Science in Kids" for teachers of grades K-8, "Physical Science at the Middle School" for grades 6-9, and "Photonics/Fiber Fever" for grades 8-12.

The Semiconductor Research Corporation Competitiveness Foundation conducted a pilot program in the summer of 1989 at Research Triangle Park, North Carolina, in which 16 local high school teachers learned how participating corporations use science and mathematics in high-technology industrial applications. The teachers' exposure to everyday practical uses of their disciplines improved their ability to promote careers in technology-based industry among their students. In 1990, this program was imported to the Hudson Valley in New York, as the Industry/University Partnership for Improving Math and Science Education. Twenty high school teachers spent six weeks of the summer visiting nearby IBM sites, the Texaco Research Center, Central Hudson Gas and Electric Corporation, Minolta Advanced Technology, Osran, Siemens, Plasmaco and Marpac Industries.

The State University of New York at New Paltz participated in the program and contributed several courses on statistics, communications and modification of pedagogy, all with industrial applications. The teachers came away with a better understanding of the need to teach students to be problem solvers, team workers and communicators. The teachers were given IBM PS/2 computers, educational software and modems. They were electronically networked to teachers in Raleigh, North

Carolina, and San Jose, California, two other IBM sites participating in the program.

Such efforts at enhancing pre-college education by industry, the national laboratories, professional societies and other sectors of the research community must continue to expand if the goal that US students be first in the world in science⁴ is to be achieved by the year 2000.

References

1. "A Nation at Risk: The Importance of Education Reform," Natl. Commission on Excellence in Education, US Department of Education, Washington, D.C. (1983).
2. "Science Achievement in Seventeen Countries: A Preliminary Report," Int. Assoc. for the Evaluation of Educational Achievement, Pergamon, New York (1988).
3. H. L. Hodgkinson, *All One System: Demographics of Education, Kindergarten through Graduate School*, Inst. for Educational Leadership, Washington, D.C. (1985).
4. *America 2000: An Education Strategy Sourcebook*, US Department of Education, Washington, D.C. (1991).
5. For a report on the Physics Teacher Resource Agent Program, as well as names of the PTRAs in your area, write to: AAPT, 5112 Berwyn Rd., College Park, MD 20740.
6. To receive the CHIC newsletter, write to: Peter Lindendorf, Editor, CHIC Newsletter, APS, 335 East 45th St., New York, NY 10017.
7. *Bull. Am. Phy. Soc.* **36**, 1715 (June 1991); **36**, 1888 (July/August 1991).
8. "Math/Science Education Action Conference Report," US Department of Energy, Natl. Technical Information Services, Springfield, Va. (1990).
9. *Laboratory-Based Science Education Programs*, US Department of Energy, Washington, D.C. (1991). For a listing of DOE laboratory programs, write to: University and Science Education Programs, Office of Energy Research, US Department of Energy, 1000 Independence Avenue, S.W., Washington, DC 20585.
10. For more information, contact Marie L. Earle, Executive Director, Industry Initiatives for Science and Math Education, c/o Deskin Research Group, 2270 Agnew Road, Santa Clara, CA 95054, (408) 496-5340. ■

"Document Control"

TYPE: INFORMATION DOCUMENT NUMBER: 9125096
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: MASSEY, Walter E.: NATIONAL SCIENCE FOUNDATION

TO: DR. D.A. BROMLEY

DATE OF CORRESPONDENCE: 12/04/91

SUBJECT: HE IS FORWARDING THE REPORT OF THE COMMITTEE ON PHYSICAL, MATHEMATICAL, AND ENGINEERING SCIENCES FOR FY 1991.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT: 12/18/91

COPIES TO: D. Allan Bromley INTERNATIONAL/POLICY
PHYSICAL SCIENCES
INDUSTRIAL
FCCSET

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

CLOSED

Vickie

OSTP RECEIVED: 12/13/91 DEPT RECEIVED:
FILE: P-PHYSICAL SCIENCES
CENTRAL FILES:

5096 I

NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550

RECEIVED



OFFICE OF THE
DIRECTOR

91 DEC 13 AM 10

December 4, 1991

OSTP
MAIL ROOM

Dr. D. Allan Bromley
Assistant to the President for
Science and Technology
Room 358
Old Executive Office Building
Washington, D.C. 20506

Dear Dr. Bromley:

As specified in the Charter of the Committee on Physical, Mathematical, and Engineering Sciences, I am transmitting a report of the Committee's activities during FY 1991. The Committee had a very productive year in 1991, and I look forward to a similar level of activity in 1992.

Sincerely,

Walter E. Massey
Chair
FCCSET Committee on
Physical, Mathematical,
and Engineering Sciences

Enclosure

Copy to: Dr. Victoria Sutton

**FCCSET COMMITTEE ON
PHYSICAL, MATHEMATICAL, AND ENGINEERING SCIENCES**

**ANNUAL REPORT
October 1, 1990 - September 30, 1991**

The purpose of the Committee on Physical, Mathematical, and Engineering Sciences (CPMES) is to advise and assist FCCSET to increase the overall effectiveness and productivity of Federal R&D efforts in the physical, mathematical, and engineering sciences. The Committee addresses policy matters which cut across agency boundaries and provides a mechanism for interagency science policy coordination and exchanges of information regarding the physical, mathematical, and engineering sciences.

12 departments and agencies are members of CPMES: Defense, Interior, Agriculture, Commerce, Health and Human Services, Energy, Education, Office of Management and Budget, Office of Science and Technology Policy, National Aeronautics and Space Administration, Environmental Protection Agency, and National Science Foundation.

The CPMES held six meetings during the period October 1, 1990 to September 30, 1991. The meeting dates were October 31, 1990; December 18, 1990; January 22, 1991; April 18, 1991; July 22, 1991; and August 23, 1991.

For the most part, the accomplishments of the Committee are reflected in the activities of its Subcommittee and Working Groups. One Subcommittee and two Working Groups have been formed that report directly to the Committee:

- * Subcommittee on High Performance Computing, Communications, and Information Technology
- * Working Group on Access and Representation
- * Working Group on the Structure of Science Support

The Subcommittee on High Performance Computing, Communications, and Information Technology (HPCCIT)

The HPCCIT Subcommittee of CPMES, the successor to the Executive Committee of the High Performance Computing and Communications Working Group, was formally chartered in summer 1991. The Subcommittee facilitates coordination of multi-agency activities in information technology under CPMES, including the Federal High Performance Computing and Communications Program (HPCC). The membership of the HPCCIT Subcommittee includes a representative from each member agency in the HPCC. Two new member agencies were added - National Institutes of Health and Department of Education - for a total of nine. HPCCIT has four discussion groups which track the four major elements of the HPCC program.

OMB Budget Process: The HPCCIT prepared a report on High Performance Computing and Communications which was approved by CPMES and transmitted to FCCSET to supplement the President's FY 1992 budget submission to Congress. Preparation of the FY 1993 Budget Notebook, according to OMB Terms of Reference, is a major contribution of the HPCCIT. This required the creation of a management plan subject to OMB approval, collegiate review of the individual agency budgets by the HPCCIT, presentation to and review by CPMES of the coordinated interagency plan, recommendations by CPMES to the individual agency heads on funding levels, and briefing and presentation to OMB of the Budget Notebook in September 1991. HPCCIT responded to fifty questions from OMB on the Notebook.

Outreach: In addition to implementing a general policy of initiating ties to other FCCSET cross-cut activities and making presentations to the high performance community at large, HPCCIT participated in several other outreach activities.

1. Congress: HPCCIT was responsive to the OSTP policy of keeping the Congress briefed on the content and meaning of the HPCC, and provided budget reviews. In the process, the Administration position on HPCC was negotiated.
2. CSPP: HPCCIT provided a briefing to the Computer Strategy Planning Project (CSPP) and welcomed their interest in the program. More cooperative interaction with CSPP is expected.
3. S&T Agreement: U.S. cooperation under the U.S.-Japan Science and Technology Agreement is overseen by OSTP. In July, 1991, HPCCIT participated in the Joint Working Level Committee Talks in Tokyo and led the Working Group Meeting on Supercomputing. The U.S. has initiated the first joint project in high performance computing under the Agreement - a workshop on supercomputer performance evaluation conducted with the Japanese in Hawaii in July. In Tokyo the Japanese demonstrated a keen interest in joint research in advanced robotics systems incorporating supercomputer technology. HPCCIT has not been successful to date in stimulating U.S. interest in joint research with the Japanese in high performance computing although there is general agreement on HPCCIT that joint development in applications software could be advantageous to the U.S.
4. NACS and Micro Tech 2000: HPCCIT members have participated in the activities of the National Advisory Committee on Semiconductors (NACS) and have provided support in planning and in the preparation of reports. HPCCIT members participated in the workshop that produced the Micro Tech 2000 report, a blueprint for the achievement of a balanced U.S. capability to manufacture a gigabit SRAM by the year 2000. The report may become the basis for future U.S. activity in the pursuit of such a goal.

The Working Group on Access and Representation

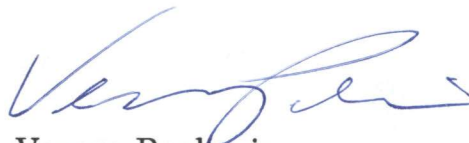
The report of the Working Group was received by the CPMES and discussed at the April 18, 1991 meeting. No formal action has been taken on the report.

The Working Group on the Structure of Science Support

The Working Group briefed the CPMES on its progress throughout the year. The draft report of the Working Group was circulated to all members of the Committee in September 1991. One of the first activities of the CPMES in FY 1992 will be to recommend the next step for this report.

Potential New Issues for CPMES

A few topics surfaced during the course of the year as possible issues for CPMES consideration. The Committee heard a presentation on mathematics as a subject for future FCCSET action. A discussion group was formed to investigate agency plans in this area and to clarify the role of mathematics in ongoing FCCSET cross-cuts. The findings of the discussion group will be reported to the Committee early in FY 1992. The health of academic research infrastructure and telecommunications were also suggested as possible CPMES topics, but both are in too early a stage to yet be considered serious candidates. Both topics will be explored more fully in FY 1992.



Vernon Pankonin
Executive Secretary/CPMES
November 26, 1991

THE WHITE HOUSE
WASHINGTON

December 18, 1991


Dear Walter:

Many thanks for your letter of December 4 with which you include the Annual Report of the FCCSET Committee on Physical, Mathematical, and Engineering Sciences.

I am much indebted to you for taking on the chairmanship of this important Committee and I have been impressed by the high quality of the work completed and underway. Your leadership is a very important element of the Committee's success.

With warmest personal regards,

Sincerely yours,



D. Allan Bromley
The Assistant to the President
for
Science and Technology
and
Chairman, Federal Coordinating Council
for
Science, Engineering and Technology

The Honorable Walter E. Massey
Director
National Science Foundation
1800 G Street, Northwest
Washington, D.C. 20550

"Document Control"

TYPE: INFORMATION DOCUMENT NUMBER: 9125061
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: GOODMAN, Charles: INDIANA UNIVERSITY CYCLOTRON FACILITY

TO: DR. D.A. BROMLEY

DATE OF CORRESPONDENCE: 12/03/91

SUBJECT: A LETTER EXPRESSING HIS CONCERN WITH THE DOE "TIGER TEAMS" AND THE FUTURE OF AMERICAN SCIENCE.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

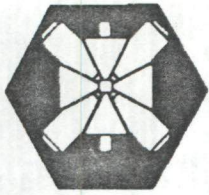
SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PHYSICAL SCIENCES

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REMARKS: PHONE: EXT:

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FILE: P-PHYSICAL SCIENCES
CENTRAL FILES:



INDIANA
UNIVERSITY
CYCLOTRON
FACILITY

2401 Milo B. Sampson Lane, Bloomington, Indiana
Telephone: 812-855-9365

47408-0768
FAX: 812-855-6645

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91 DEC 10 AM 11:39

December 3, 1991

OSTP
MAIL ROOM

Dr. D. A. Bromley
Presidential Science Adviser
The White House
Washington, DC, DC

December 3, 1991

Dr. D. Alan Bromley
Presidential Science Adviser
The White House
Washington, DC

Dear Alan,

I am presently at the Institut fuer Kernphysik of the KFA in Juelich, Germany, on a Humboldt Foundation Fellowship, and it is only through the miracle of electronic mail transmission that it may appear that I am in Bloomington.

By the same miracle I am not entirely out of touch with the woes of US science. Also, from this perspective, the outlook might seem bleaker than it would were I in the US. I say this because in seeking English news on television I find myself exposed to mostly economic reports that I don't customarily watch in the US. It becomes clearer and clearer that the only way the US economy can advance in the future is through high technology which depends on science.

With respect to science funding, the immediate crisis that the nuclear physics community is concerned with is the 10% cut being considered for DOE nuclear science. I see this as the final death knell for DOE nuclear science. Even before this came up I saw the DOE funded nuclear physics staggering under the heavy financial burden and the demoralization wrought by Admiral Watkins' Tiger Teams. This has hit even our NSF funded work at Indiana because some scientifically important experiments of our Indiana-LAMPF collaboration were simply not run last summer in fear of and in preparation for the Tiger Teams.

In my view the Tiger Teams represent power where it can be very destructive. It may look politically good to try to improve the safety of nuclear research. (It would be more than politically good to improve the safety in the nuclear industry,

the mining industry, the chemical industry, and the workplace in general.) But it is important to distinguish real concerns from show.

The problem with the Tiger Teams is that they have been given the power to be destructive. They can hide behind the concept that safety is motherhood, and they have the power to kill your project if you don't kowtow to them. They are obsessed with "calibration of instruments." They don't understand that a quick, qualitative check of hot spots with a survey meter so you know to stay away from them contributes much more to safety than entering calibration dates and serial numbers into logbooks every time an instrument is used. They do not understand, for example, that every time one uses a multimeter to check continuity, one calibrates the meter exactly to the required precision by touching the leads together.

On top of the colossal burden imposed by all this "safety" accounting, I understand that, triggered by the abuses at Stanford, another chunk of the DOE budget will be siphoned off to pay a host of new accountants to look for more possible abuses. Then, on top of all these troubles are we are supposed to tolerate a real cut of 10%?

I feel that DOE funded science is already done for, and NSF funded science is not much farther from its demise. Unless we can get some money all the way to the people who are really doing the research I don't see much hope for the future of US science. You may be the only one who can carry this message to the Bush administration.

On the personal side, Jody and I have suffered a tremendous tragedy. Our house in Oakland with all our personal memorabilia and valuable possessions was destroyed in the Oakland Fire Disaster. The things we lost go back even to the Lilac Drive days and include a large and valuable library, artworks, and all my 16mm movies of the children growing up, my movies of physics conferences including the Rutherford conference starring you along with such old timers as Kay Way and Brian Flowers. We are perhaps lucky that we were not in Oakland at the time. Twenty-five people in our neighborhood died.

I wish I had more cheerful news to report.

Best regards,
/sign/

Charles D. Goodman
(The signature is prerecorded and I can't shorten it.)

Present address:
Institut fuer Kernphysik
Forschungszentrum Juelich GmbH
D-5170 Juelich, Germany

Charles D. Goodman
1885 Grand View Drive
Oakland CA 94618

Dr. D. A. Bromley
Presidential Science Adviser
The White House
Washington, DC, 20500

*This letter was electronically transmitted and distributed by **MCI Mail***

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THE WHITE HOUSE

WASHINGTON

December 18, 1991

Dear Charles:

First of all, I am terribly sorry to hear of the loss of your home and all your belongings. I can appreciate what an enormous disaster this must be for you and Jody and I am afraid that there is nothing that anybody can say that really will help. One of my associate directors here in the office had the fire burn up to his rear steps but, fortunately, it stopped at that point so he came perilously close. Unfortunately, as you note, a number of his neighbors, in fact, died in the fire.

With this disaster facing you I am sure that your stay in Germany is no where near as pleasant as you had hoped that it would be and I am sorry about that.

Perhaps a little on the sunnier side, I think that I can assure you that the situation in nuclear physics will, in fact, not be any where near as bad as the rumors had suggested would be the case, and I do not anticipate a cut at all in the overall funding for the field. What you heard about was something of a trial balloon.

With respect to the Tiger Teams, I understand completely what you tell me and have heard it from a great many others. Unfortunately, the Teams found a number of truly egregious situations in some of the national laboratories and this has provided a basis for a much more sweeping approach than I think anyone had anticipated at the outset. I have been told by a number of directors of the major laboratories that, for all practical purposes, they have been shut down for a number of months first, because of the safety Tiger Team and, subsequently, because of a second wave of Teams investigating procurement and accounting practices. Unfortunately, once something of this sort develops a momentum of its own, it is almost impossible to get it stopped, but I understand only too well the difficulties that are being created and am talking with the appropriate people here in Washington to see if we can get activities refocused on research.

I am very sensitive to the point you make about NSF where year after year, although the total Foundation received significant increases, the brand name sciences received inflationary increases, if that. This year we requested an 18% increase for NSF as an institution, and further requested a 16% increase for the basic sciences. The Congress has responded almost completely to our request so I hope that fiscal year 1992 will be a substantially better one than in the past for NSF grantees. We have also boosted the funding for individual investigator initiated research through NIH by close to 10% so that side of the house will see some improvement as well. The situation in DOE is, of course, more difficult because of the construction projects at CEBAF, RHIC, Fermi Lab, and, of course, SSC. All of this is still somewhat up in the air and will be sorted out within the next few months.

It was good to hear from you but I am sorry that your news was so tragic.

Let me take the occasion to wish you and Jody as happy as possible a holiday and as rewarding as possible the remainder of your stay in Europe.

With warmest best wishes,

Sincerely yours,



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

Dr. Charles Goodman
Institut fuer Kernphysik
Forschungszentrum Juelich GmbH
D-5170 Juelich, Germany

"Document Control"

TYPE: INFORMATION
ORIGINATOR: 02

STATUS C

DOCUMENT NUMBER: 9125064
DIRECTORATE STATUS

FROM: EVERETT, J.L.

TO: DR. D.A. BROMLEY

DATE OF CORRESPONDENCE: 12/02/91

SUBJECT: RE: HIS VIEWS ON THE HTGR REACTOR AND THE NEW PRODUCTION REACTOR.

DIRECTORATE ASSIGNED: STAFF ASSIGNED:

*12/13
Karl's
Comments
date*

ACTION REQUIRED: STAFF ACTION:

***** SENDER'S DUE DATE: *****

OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PHYSICAL SCIENCES

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

REMARKS: *Why not send him a personal note?*

("Welcome your expression of support for HTGR — may call on you for help in the future, etc —")?

OSTP RECEIVED: 12/10/91
FILE: P-PHYSICAL SCIENCES

DEPT RECEIVED:

CENTRAL FILES:

Karl



5064

RECEIVED

MR. J.L. EVERETT, III

91 DEC 10 AM 11:39

185 Egret Lane
Vero Beach, Florida 32963
(407) 231-6263

POST
MAIL ROOM

December 2, 1991

Dr. D. Allan Bromley
Assistant to the President for Science and Technology
360 Old Executive Office Building
Washington, DC 20500

Dear Dr. Bromley:

Before I retired in 1988 I was Chairman and CEO of the Philadelphia Electric Company, having served prior as V.P. of Engineering and Research, Executive V.P., and President. During my years I had responsibility for the Company's nuclear power program starting with Peach Bottom Unit No. 1, an HTGR prototype power plant. We operated that unit for about 5 years, in the 1960's and through 2 cores. We would have continued to operate the plant except for its size. 40 Mw electric was just too small to be economical.

I understand that the Administration together with the Department of Energy is in the process of making decisions about the next production reactor for tritium production. While it was a relatively small prototype of a power plant, Peach Bottom No. 1 had most of the characteristics of a large scale plant. I believe the experience we had in operating that plant should be of importance in evaluating the alternate types of reactors for the new production reactor.

First and foremost the Peach Bottom HTGR was an exceptionally easy reactor to operate. Because of the huge amount of graphite moderator in the core any power change whether intended or inadvertent was felt very slowly. Temperature changes were quite gradual and the operators had ample time to take any corrective action if needed. With the burnable poison built into the fuel, the temperature coefficients were quite negative, which also made the reactor exceptionally easy to control. A good many of our reactor operators from the Peach Bottom HTGR were trained on the GE boiling water reactors that went into commercial operation in the mid 70's. I've heard them say many times that they wished the water reactors were as easy to operate as the HTGR.

Second, the reactor plant was very clean to operate in terms of controlling incidental plant radiation. Compared to any water reactor it was much easier to live with, but compared

to a boiling water reactor it was a dream! The HTGR system simply produces but a tiny fraction of the in-plant radiation that a water reactor does. This not only reduces personnel exposure, but reduces plant costs, and simplifies maintenance. This was a considerable asset of the HTGR.

Finally, the HTGR would be an efficient power producer in addition to producing strategic materials. It's inherent high temperature system gives it the capability of producing significant amounts of electrical energy, which is needed in just about every region of the country. The production and sale of that power should add to the economics of the system. Successful deployment of the HTGR as a dual purpose machine would provide another choice for utilities to add nuclear capacity in the future, with environmental benefits as well as much needed capacity.

I hope these few comments from one who has had first hand experience with operating an HTGR power plant. In my opinion it is definitely a superior system. If I can be of any additional assistance I would be most happy to be of service.

Sincerely,

A handwritten signature in blue ink, appearing to read "J. L. Wertz". The signature is stylized and includes a flourish at the end.

THE WHITE HOUSE
WASHINGTON

April 15, 1992

Dear Mr. Everett:

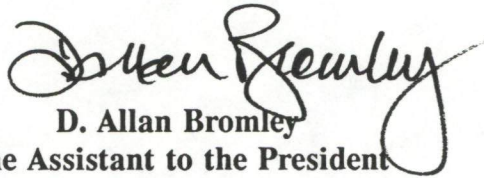
Difficult as it may be to believe I do actually answer my mail and in this case I have to begin with profound apologies for the long delay in responding to your good letter of December 2 concerning the Nation's nuclear future and your experience with an HTGR prototype.

I welcome your support for the HTGR approach and may very well call on you for help in the not too distant future when we again turn to detailed discussions of the important questions involved in developing a viable future civilian nuclear power option.

I myself have long been attracted by the intrinsic safety features and the high operating temperature of the HTGR and less than impressed with the viable future of liquid metal units.

I very much appreciate your taking the initiative to write to me. The experience of someone like yourself can be invaluable to me in the months ahead. For the moment please accept my thanks and I shall look forward to interacting with you in greater detail in future.

Sincerely yours



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

Mr. J. L. Everett, III
185 Egret Lane
Vero Beach, Florida 32963

"Document Control"

TYPE: INFORMATION
ORIGINATOR: 02

DOCUMENT NUMBER: 9125095
DIRECTORATE STATUS

STATUS C

FROM: HECKER, S.S.: LOS ALAMOS NATIONAL LABORATORY

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 12/02/91

SUBJECT: A THANK YOU LETTER TO DR. BROMLEY FOR HIS HELP WITH
THE SUPERCOMPUTING '91 CONFERENCE. HE ALSO IS
ENCLOSING INFORMATION ON LOS ALAMOS AND WHAT THEY
NEED TO DO TO BECOME MORE COMPETITIVE IN THE FUTURE.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT: 12/18/91

COPIES TO: D. Allan Bromley
PHYSICAL SCIENCES

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

CLOSED

OSTP RECEIVED: 12/13/91 DEPT RECEIVED:
FILE: B-PHYSICAL SCIENCES

CENTRAL FILES: Pres



Los Alamos National Laboratory
of the University of California
Los Alamos, New Mexico 87545

91 DEC 13 All 10 December 2, 1991

OSTP
MAIL ROOM

The Honorable D. Allan Bromley
Science Advisor to the President and
Director of the Office of Science and Technology Policy
The Old Executive Office Building
17th Street and Pennsylvania Ave., NW
Washington DC 20506

Dear Allan:

Just a brief note of thanks for helping us out with the Supercomputer 91 Conference. Your keynote presentation was superb. It provided an inspiration for the thousands of computer oriented people present.

I also greatly enjoyed our dinner. It was very gracious of you to give us so much time. As we discussed, the national laboratories face some extraordinary challenges in the next five years. First, we must define a mission that is of unquestioned national need. This, I believe, is what helped make the nuclear weapons laboratories so valuable over the years. In the future, we will need multiple missions. I enclose a recent House testimony that describe what laboratories such as Los Alamos can contribute in the nondefense arena. The common element in all of these areas is using and fortifying our core technical competencies. One of these competencies is high-performance computing. I enclose a brochure about the Advanced Computing Laboratory at Los Alamos that you may find interesting.

Second, we must change the way we operate our laboratories to reflect the numerous changes in public opinion and federal bureaucracy. I enclose an article that I wrote following the closeout of the Tiger Team at Los Alamos. I hope it provides you with some insight to what I believe we need to do to become more competitive in the future.

Thanks for you continued interest in the laboratories. Don't hesitate to call if I or any of my staff can be of service to you.

Sincerely,

S. S. Hecker
Director

Encl: Inside Story
Oct. 9 Testimony

SSH:bly

The Inside **Story**

by Sig Hecker



The audit is over; now what?

The Tigers are gone. What's next? I want to share with you my remarks at the final close-out by the Tiger Team leaders last Friday. But first I want to thank all of you who have worked so hard to get us through this difficult time. Thanks to you we have made a lot of progress.

How did we do and what did we learn?

The team leaders' hour-long report demonstrated that we have many problems and a long way to go to get into compliance. The Tiger Team raised very important issues, not the trivia that one may have expected from Tiger Team folklore. For example, it raised serious concerns in how we deal with fire protection, emergency preparedness, confined spaces/limited egress and lockout/tagout procedures, all of which impact worker safety. The team raised our awareness of the importance of protecting the environment.

The tigers had many concerns, but numbers alone do not tell the whole story. The number of findings was high because there were lots of tigers — 168 at the height of their visit. We also gave the tigers a good road map — our hard-hitting self-assessment. Then there is the nature of our Laboratory. We have operational diversity (we work with everything), geographic separation (43 square miles), many aging facilities and organizational independence.

Our progress in attaining the desired environmental, safety and health culture did not go unnoticed. The Tiger Team found a healthy attitude. We identified most of the problems ourselves through our self-assessment. We have begun to lay out an action plan. None of our facilities was shut down and the Tiger Team found no skeletons in our closet — not in safety and health nor in the environmental arena. Most importantly, our operations do not pose a safety, health or environmental risk to the public.

What did we gain from the Tiger Team process?

The direct benefits included developing the ability to assess ourselves. The match between our self-assessment and the Tiger Team findings was 77 percent, the best of any Department of Energy site to date. The Tiger Team helped us finish Round 1 of our comprehensive assessment. We now have for the first time a baseline of where we are in ES&H compliance and the way we do business. We also were able to learn from the tigers' experience elsewhere about best ES&H and management practices, and our action-planning process is the beginning of a road map not only for compliance but also for ES&H excellence.

We accrued numerous indirect benefits from the Tiger Team visit. The visit was one giant team-building exercise — across groups, divisions, directorates, plus across support and services and technical lines. All of us gained a much better appreciation for our ES&H professionals, both those in divisions and in the Coordination Center. We accomplished a lot of on the job management training in the past few months. We had the opportunity to watch a number of people shine in a new environment.

All of us now have a better appreciation for ES&H accountability. We now know just how important ownership is. We will apply the accountability lesson elsewhere. The Tiger Team exercise also gave us the chance to take an introspective look at the rest of our operations.

What do we have to do now?

Officially there is a prescribed timetable for action that includes factual accuracy checks, response on the more serious findings and an action plan. We are negotiating the timetables. We have been working on an action plan since August, but we need more time to do the job right. In other words, there's no time to relax.

The action plan will require significant changes in our operations and business practices. It is not just a matter of fixing Occupational Safety and Health Administration violations. I will continue to need help, ideas and cooperation from all of you. The time commitment and price tag for strict compliance are staggering. Taken at face value, we could be consumed doing nothing but corrective actions for several years.

Hence, we must set priorities based on risk; that is, take a sensible graded approach and focus on the most significant problems first. Also, we must focus not just on compliance, but embrace a revolution in our business practices. Let me explain.

Like the rest of you, I don't enjoy getting beat up. I died a thousand deaths during the daily Tiger Team outbriefs. I don't enjoy reacting and spending the next five years working just to come into compliance. Instead, I want to build a new way of operating our Laboratory. I want us to be more productive and more efficient by adopting a quality management or continuous quality improvement approach, which will at the same time also bring us into ES&H compliance.

My goal is that in five years we will not only be the finest scientific laboratory in the world, but also the best managed, most productive and most efficient — setting an example for ES&H excellence in the process. I believe that this is a realistic goal. If one analyzes the Tiger Team findings, one finds that most of the shortcomings are in the management process, not in our facilities or our people. A quality management approach is all about managing better; doing things right the first time and empowering everyone to contribute.

Quality management has also become a way of life in America's best companies. Companies such as Motorola and Xerox have pioneered quality programs not just to comply with U.S. laws and regulations, but to be competitive internationally. Motorola, for example, has increased the quality of its products over a thousandfold in the 1980s. It now boasts a defect rate of 5 per one million opportunities — and it is working to improve that!

Los Alamos is not a factory, but most of the common-sense principles of a total quality management approach still apply. I plan to re-examine our organizational structure and how we conduct business and begin implementation of a quality management approach in January. You will all be involved because that's how the process works. I will need your help to make it work. I will keep you informed.

We will also need DOE's help. Without full cooperation from DOE, quality management won't work. The current way in which DOE develops and disseminates orders, regulations and directives doesn't work. As we adopt formality of operations, so must DOE. We must have better coordination and more trust and teamwork. We cannot continue to run parallel fire drills on similar subjects with multiple DOE offices. The department must sort out the roles, missions and protocols for its various offices and locations.

The University of California also will be crucial to our initiative. We are very encouraged by the business-like approach taken by the university during the current contract renewal negotiations.

Was the Tiger Team process necessary and will we ever get back to science?

You bet, on both accounts! The Tiger Team exercise is much like the sight of the guillotine — it helps to focus your mind. It got us to move; to rally our forces. The Tiger Team process helped us establish a baseline for the Lab's ES&H status and an appreciation for excellence. It helped us develop the skills for self-assessment and to effect a cultural change.

The Tiger Team process itself has matured. Now it works. (I was very skeptical after watching the Livermore outbrief in April 1990). The tigers are professionals. The process is much more structured. And, the Lab was in a much better position to take advantage of the team's experience. Some say the Laboratory took too long to respond. Maybe we did, but I have no apologies because we are on the right track. Effecting a cultural change takes time in an organization like ours.

We also will get back to science. The more crucial question is: Will the nation be able to afford us? To succeed we must improve both technical and support operations to become more efficient and the DOE must accept a sensible, graded, risk-based approach to dealing with ES&H.

We will rise to meet the challenges

Today, the Laboratory faces many other challenges. Our historic missions and roles are being challenged by the incredible changes taking place in the world. I am confident that we will rise to meet these challenges because we still have the best collection of people in the world. The ES&H and business challenge is even a more serious one. We will have to do better to be competitive. In other words, if we run our business well, the science will be easy to do. I need your help to pull it off.

I also want to thank Jim Magruder and his Tiger Team for being so professional and working hard to help us. Thanks to them, we learned a lot. Thanks also to the DOE Albuquerque and Los Alamos offices. Their support during this trying time was excellent. I believe that it helped to draw us closer together into a better working relationship.

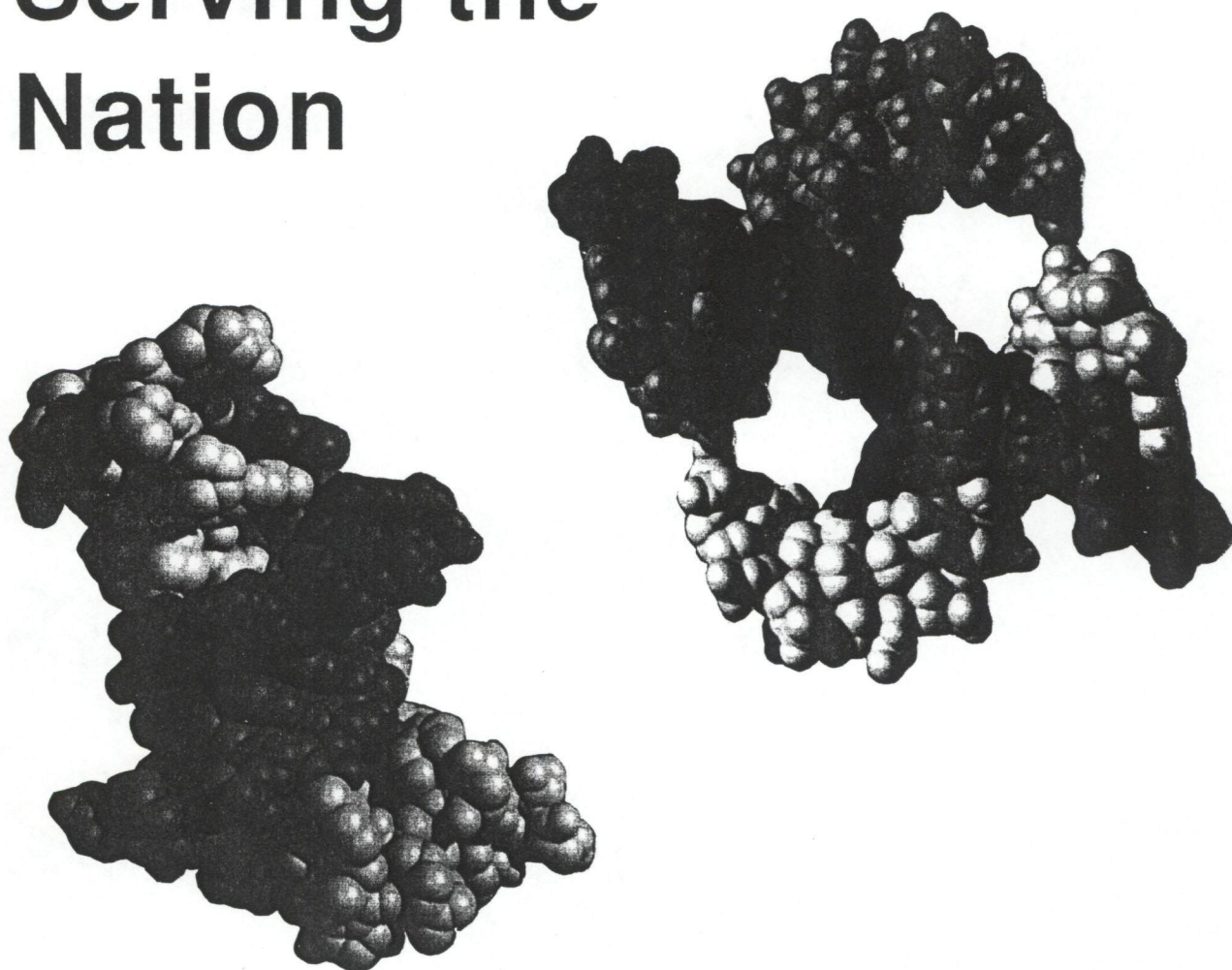
Finally, thanks to all of you. The past few months have not been easy for anyone. I appreciate the help and dedication that I received from each of you. With the attitude you displayed we will meet the difficult challenges that lie before us.

A handwritten signature in cursive script, appearing to read "Jim", located in the lower right quadrant of the page.

LA-UR-91-3350
October 1991

Los Alamos:

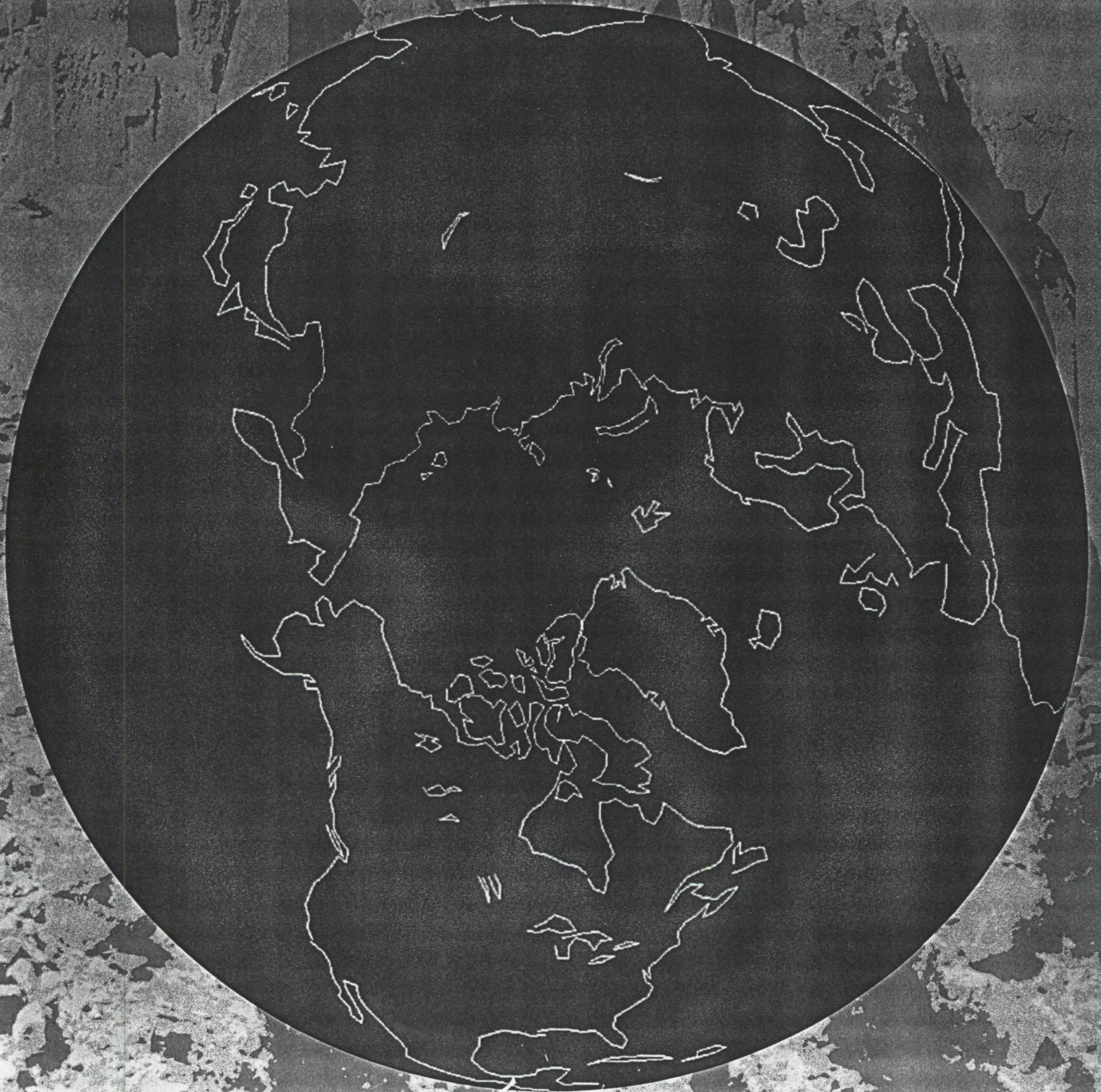
**Science
Serving the
Nation**



October 1991

■ LOS ALAMOS
NATIONAL
LABORATORY

ADVANCED COMPUTING
LABORATORY



THE WHITE HOUSE

WASHINGTON

December 18, 1991

Dear Sig:

Just a brief note to thank you for the material that you provided with your letter of December 2. The brochure from the Advanced Computing Laboratory is an outstanding one and I was particularly interested by the document **Los Alamos: Science Serving the Nation**. You have made a compelling case for the Laboratory and this document will be extremely useful to me in providing support for science and generally as well as for Los Alamos.

I much appreciated your warm hospitality while I was in Albuquerque and the dinner with you and the other lab directors was of great interest and the discussion I found to be extremely helpful.

Your approach to the Tiger Team activities is, I think, a very constructive one and in the long run vastly more successful than confrontational ones that have occurred elsewhere. Unfortunately, it is certainly the case that some elements of safety were not observed as carefully in the laboratories as they should have been, and it is also true that in some cases the Tiger Teams over-reacted. The fact remains, however, all of the labs must be operated in a safe manner and the sooner we come to terms with that the sooner we can get back to doing our primary business.

I regretted that I was not able to stay for more of the Supercomputer '91 sessions because I was very much impressed by the general enthusiasm that seemed to be present on every side, and the remarkable quality of the exhibits which I was only able to see in the most cursory fashion.

You will be pleased to know that the President signed the High Performance Computing Bill a week ago in a signing ceremony in the White House. I believe that this program to bring the United States more fully into the information age is now off and running. Obviously, your laboratory has been a major contributor in that area and I know will continue in that role.

Let me take this occasion to wish you and your family a very merry Christmas and a happy, healthy and rewarding 1992.

With warmest regards,

Sincerely yours,

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

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

Dr. Siegfried S. Hecker
Director
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

"Document Control"

TYPE: INFORMATION DOCUMENT NUMBER: 9125008
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: SANDERS, Stephen J.: UNIVERSITY OF KANSAS

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 11/25/91

SUBJECT: HE IS FORWARDING A COPY OF HIS LETTER TO SENATORS
DOLE AND KASSEBAUM, AND REPRESENTATIVE SLATTERY
REGARDING THE PROPOSED BUDGET CUTS IN THE DOE
NUCLEAR SCIENCE RESEARCH PROGRAMS.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

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

COPIES TO: D. Allan Bromley
PHYSICAL SCIENCES
Carl Bretscher

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

OSTP RECEIVED: 12/04/91 DEPT RECEIVED:
FILE: P-PHYSICAL SCIENCES
CENTRAL FILES:

5008



THE UNIVERSITY OF KANSAS · LAWRENCE, KANSAS · 66045-2151

RECEIVED

Nov 25, 1991
91 DEC 4 9:45

DEPARTMENT OF
PHYSICS & ASTRONOMY
913-864-4626
Fax 913-864-5262
Telex: 535004 DEPT PHYS ASTR

OSTP
MAIL ROOM

U.S. Senator Robert Dole
141 Hart Senate Office Building
Washington, D.C. 20510

U.S. Senator Nancy L. Kassebaum
302 Russell Senate Office Building
Washington, D.C. 20515

U.S. Representative Jim Slattery
1431 Longworth House Office Building
Washington, D.C. 20515

Dear Senator Dole, Senator Kassebaum, and Congressman Slattery:

We are writing to ask your help in preventing a potentially disastrous blow to education in the physical sciences in the United States. Changes proposed for the research budget at the Department of Energy threaten to seriously undermine the future of basic science in our country. At risk are the research programs in nuclear and high energy physics, two of the core subfields of physics.

On October 23, 1991, the Department of Energy asked the Nuclear Science Advisory Committee (NSAC) to present a plan to anticipate a 10% reduction in FY93 funding from that of FY92 (about a 15% decrease with inflation). At the same time, the National Science Foundation asked NSAC for a plan assuming constant or slowly increasing dollars over the next several years. (NSAC was formed at the request of the agencies to advise them on the priorities of the nuclear science research community. In 1989, NSAC responded to the request of these agencies for a Long Range Plan for the future of research in nuclear science in this country. After long and thorough consultation with representatives of this community, they responded with a responsible, but austere plan which the agencies have accepted to this point.) In addition, HEPAP, the similar committee for the high energy physics community, has been given the same message, excluding only the SSC in the consideration of the facilities at risk.

Such an abrupt and unexpected cut will negatively impact science education in many ways. National research facilities such as Argonne, Berkeley, Brookhaven, Cornell, Fermilab, Los Alamos, and Oak Ridge will need to cut back on the availability of their accelerators for university researchers. This will make it more difficult for graduate students to obtain the data necessary for their theses and to gain the necessary experience in experimental science. Support for research for university faculty

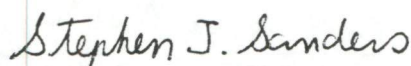
will become even more difficult to obtain. Since much of this latter support goes to salaries for graduate students, summer salaries for faculty, and travel expenses for research activities at the national facilities, this proposed cut will inevitably lead to a reduction in the number of students entering graduate study in these important subfields of physics and a migration of students and young faculty out of these fields. Nuclear physics is widely recognized for the strength of its graduate student training. Our students become expert with the most recent advances in technology and many go on to become leaders in civilian and defense industries, as well as related fields of research. These are the people of the future in science and technology in this country, so it seems incredibly short-sighted to make such cuts when the loss of leadership in these fields in this country is being deplored.

At the time the SSC was approved, it was done with the commitment that its funding would not be done at a cost to the rest of nuclear science. That commitment now seems to have been abrogated. Yet the current and upcoming students and the young faculty in physics are the people who will be needed to make use of it.

Our programs at the University of Kansas in nuclear and high-energy experimental physics are typical of those at other small to medium-sized universities. In nuclear physics, we and three graduate students rely on the ATLAS facility at Argonne National Laboratory to obtain our data. In high-energy physics, four faculty, five graduate students, and a research associate make similar use of CESR, the electron accelerator at Cornell University. Either or both of these programs are in danger of elimination, or severe curtailment in both direct support and the laboratories we use, with the proposed cut.

While we recognize that none of you are on the committees which are giving initial consideration to the FY93 budgets of these agencies, you can help when these budget considerations come to the floor. It would also help if you were to indicate your concern to the persons listed below to whom we are sending copies of this letter.

Sincerely,



Stephen J. Sanders,
Associate Professor of Physics and
Chairman,
ATLAS Users' Executive Committee,
Argonne National Laboratory



Francis W. Prosser
Professor of Physics and
Associate Chairman,
Department of Physics and Astronomy,
The University of Kansas

cc: Admiral James D. Watkins, Secretary of Energy
Dr. D. Allan Bromley, Science Advisor to the President
Dr. William Happer, Director of Energy Research, DOE

"Document Control"

TYPE: INFORMATION DOCUMENT NUMBER: 9124988
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: AGNEW, Harold

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 11/25/91

SUBJECT: HE IS FORWARDING A COPY OF A LETTER FROM SENATOR
NUNN TO ADMIRAL WATKINS REGARDING THE NEW PRODUCTION
REACTOR AND THE RESIGNATION OF DR. MONETTA.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

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

COPIES TO: D. Allan Bromley
PHYSICAL SCIENCES

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

OSTP RECEIVED: 12/03/91 DEPT RECEIVED:
FILE: P-PHYSICAL SCIENCES
CENTRAL FILES:

Allan

Strange happenings

Hand

Document Originally
Attached to
Following Page

Allan,

I talked to Moretta.

Something fishy is going on



4988

RECEIVED

United States Senate

COMMITTEE ON ARMED SERVICES
WASHINGTON, DC 20510-6050

OSTP
MAIL ROOM

November 14, 1991

The Honorable James D. Watkins
Secretary of Energy
Department of Energy
Washington, DC 20580

Dear Mr. Secretary:

We are writing to respond both to your widely publicized letter/press release to Senator Nunn of October 31, 1991, and to your announcement of November 1, 1991, regarding the postponement of a decision on the future of the New Production Reactor (NPR), so as to study the implications for the Department of Energy (DoE) of the President's September 27, 1991 speech.

The President's speech took place after both the House and Senate had approved the National Defense Authorization Bills for Fiscal Years 1992 and 1993. Thus, the conferees on this legislation found themselves faced with a series of issues not originally contained in either bill that had to be addressed. This occurred both as the direct consequence of the weapons system cancellations the President announced, and as a result of the implications of his speech for other programs.

The President's speech makes clear that there will be substantial returns of nuclear weapons, and, therefore, substantial additions to the supply of tritium available to support our remaining nuclear weapons stockpile. Similarly, the announced accelerated retirement of all Poseidon-class ballistic missile submarines leaves us with a large surplus of W-76 warheads. The W-76 may be acceptable as a near-term substitute for the W-88 warhead on the new Trident II missile. These decisions raise several important questions for the DoE:

- Does the K-reactor need to be restarted either as an urgent priority, or at all? If so, on what timetable?
- Does the Rocky Flats plant need to be restarted either as an urgent priority, or at all? If so, on what timetable?
- What is in the best interest of the tax-paying public and the national security--continued expenditure on obsolete facilities or expenditure on new, environmentally sound, replacement facilities that meet all modern safety standards?
- Are the Rocky Flats plant and the K-reactor capable of being operated in a manner that will ensure adequate protection of public and employee health and safety, and the environment?

To answer these and other questions, Senator Warner, Senator Thurmond and we, on behalf of the Senate Armed Services conferees, proposed to the House conferees a provision that would require the President, working with Secretary of Defense Cheney and yourself, to prepare a report. This report would analyze the impact of changing world events on the requirements for nuclear weapons and on the Department of Energy Production Complex, particularly the impacts on the K-reactor and the Rocky Flats plant.

The provision would have required the report to be submitted before the Department expended more than 25% of the fiscal year 1992 funds for restart activities at Rocky Flats and for K-reactor. It would have allowed the balance of the funds (75%) to be spent either for restart activities as the Department proposed, or for accelerated construction of new facilities to replace the K-reactor and the Rocky Flats plant, if that were the President's decision. In discussions with your staff, our staff emphasized that this provision would not have prevented restart of the K-reactor, and the funding for restart would not have been interrupted unless the President himself chose to do so.

It is the responsibility of the Executive Branch to make budget recommendations, and to execute programs subject to Congressional direction. The proposed provision would have been entirely consistent with our constitutional responsibility to make budget decisions on national security issues and to provide broad policy guidance over the purposes for which funds are authorized and appropriated. We view the provision as entirely consistent with the separation of powers of two separate but equal branches of government.

The conferees continue to question whether your department should abandon its costly and time-consuming efforts to restart and operate obsolescent facilities sporadically, in favor of accelerated construction of new, modern, environmentally acceptable facilities at appropriate locations. Therefore, the conferees have agreed to a provision that would require an early Presidential report and decision on the degree of urgency in resuming production of tritium and manufacturing of plutonium weapons components. This report is due by April 1, 1992. Timely submittal of this report should provide answers to these and other important questions.

As you are presumably aware, the Senate Armed Services Committee has repeatedly called for the expedited construction of new reactor capacity for tritium production at least since 1988, when it directed that the N-reactor be placed on cold standby. In the Statement of Managers accompanying the Conference Report on the National Defense Authorization Act for Fiscal Year 1989, the conferees declared that "...the construction of an NPR on an urgent schedule should be the highest priority of the Department of Energy in meeting the future special material needs of our nuclear deterrent." Yet when your Department's long-overdue

5-year plan was finally submitted to the Congress in August of this year, the Committee first learned that funds proposed for the NPR program were inadequate to support a construction start before fiscal year 1998. Thus, at least a decade will have passed without a construction start on a new, modern capacity. DoE's record in this matter certainly does not conform to the guidance from the Congress.

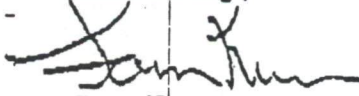
Recent press reports indicate that you were irritated with Dr. Dominic Monetta, the Director of the DoE Office of New Production Reactors, and the contractor community because they were supposedly lobbying the Senate to shift restart funding away from the K-reactor and redirect this funding to the New Production Reactor. These press reports also indicate that you assumed such efforts were the impetus for the proposed provision. If the press reports are accurate, you are dead wrong in making these assumptions. Neither of us nor any member of our staffs -- nor, to the best of our knowledge, any other Senator involved with this provision -- ever had any discussions with Dr. Monetta or the contractor community concerning this provision or its drafting.

However, even if the contractor community had been consulted or had initiated the idea, these contractors, like any one else, have an absolute First Amendment right to petition Congress and to express their views. Our national policy depends on the input from a wide variety of sources, not just the Secretary of Energy. The Constitution vests these responsibilities in more places than your office.

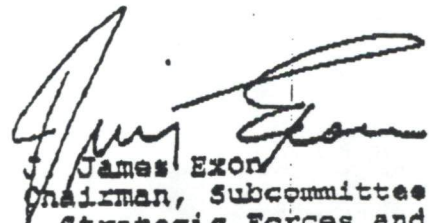
If Dr. Monetta was forced out of DoE because of any perceived involvement with this provision, or charges to that effect, he has been dealt with most unfairly by you and your department. His resignation last Monday was most unfortunate. The Department has lost an extremely capable and talented manager.

The Armed Services Committee will be holding a hearing in the next several months to review issues associated with tritium supply and your decision to postpone the NPR, the status of the K-reactor restart, and the current status of and proposed plans for Rocky Flats. We would like to invite you to testify. Our staff will be in touch with yours to determine an acceptable date and time.

Sincerely,



Sam Nunn
Chairman



James Exon
Chairman, Subcommittee on
Strategic Forces and
Nuclear Deterrence

TUCK SAYS HE EXPECTS TO LEAVE POST FOR PRIVATE SECTOR BY YEAR'S END

DOE Under Secretary John Tuck last week confirmed that he is looking for a new job, saying he hopes to arrive at a decision by the end of the year. Tuck, who has three children, said financial considerations were prompting him to consider leaving the federal government for the first time in 18 years.

As a result of his job search, Tuck said he has recused himself from a number of decisions at DOE that might involve contacts with prospective employers. He declined, however, to identify the firms with which he had had contacts. While Tuck is DOE's chief operating officer, he is best known for his role in overseeing management of the department's nuclear weapons program.

"I'm trying to get my affairs settled by the end of the year," Tuck said, explaining that he wants to help assure that the White House and Energy Secretary James Watkins have time to decide on a replacement early next year. One of his major remaining tasks at DOE, he said, will be to help complete plans for the department's portion of the FY-93 federal budget request.

"Watkins has been extremely good in allowing me the latitude to make this gear change," said Tuck, who is taking a two-week vacation.

DOE on Thursday issued a response to inquiries regarding Tuck's status, including rumors that he had resigned under pressure. "Under Secretary Tuck has recently talked to the secretary about overtures he has received from the private sector, which have caused him to think about the long term financial needs of his family," Press Secretary Joseph Karpinski said. "John is still considering these opportunities and it will be totally his decision when and if he decides to accept a position other than the one he currently holds."

The 46-year-old Tuck, who has three young children, has worked either in Congress or in the executive branch since he left the Navy in 1973. He served as an aide to ex-Sen. Howard Baker, R-Tenn., both in Baker's capacity as Senate majority leader and when he later became chief of staff to President Reagan. He joined DOE in 1989.

✓ CITING FRIENDSHIP WITH EBASCO LOBBYIST, GAULT WILL AVOID NPR DEBATE

Polly Gault, chief of staff to Energy Secretary James Watkins, has agreed not to participate in DOE's program to select a technology for the new production reactor because of a "long-term friendship" with a lobbyist for the heavy water reactor design team, Gault acknowledged last week.

Gault recused herself from deliberations on NPR technologies in July, after intervening in the NPR environmental impact statement process at the request of the lobbyist. Gault said last week she decided to remove herself from the NPR process because of her friendship with Daryl Owen, former staff director of the Senate Energy Committee and now a lobbyist for Ebasco Services Inc., one of the leaders of the heavy water reactor contractor team. Owen is a partner in the firm of Hooper Hooper & Owen.

Gault acknowledged that she got involved in the NPR EIS process after Owen raised concerns with her regarding the fairness of the DOE procedure, in which the department was comparing the heavy water technology with a competing modular high-temperature gas-cooled reactor design. The fairness concerns were also raised by the Environmental Protection Agency, which questioned several aspects of the EIS, including DOE's comparison of an HWR capable of producing the nation's full requirement of tritium with that of an MHTGR capable of meeting only half that requirement (*IE/FL*, 19 Aug. 8).

Following EPA's comments and Gault's intervention, the agency subsequently modified its EIS to reflect a full-requirement MHTGR, consisting of eight modules, instead of the previous four-module version.

Early this month, however, DOE announced it will roll the NPR EIS process into a separate document that considers the environmental impact of reconfiguring the entire weapons complex. That is expected to delay the selection of a reactor technology, originally set for this month, for at least two years.

Gault last week said her intervention was proper and did not represent a conflict of interest. "To make

sure the process works right is not in my opinion a conflict of interest. That is my job," she said. Saying she is not technically qualified to assess the two technologies, Gault added that her intervention never went beyond addressing the fairness issue.

"My main point was to assure DOE was not discouraging anyone at EPA or elsewhere from commenting freely, or criticizing if need be, on the EIS," Gault said.

Nonetheless, responding to perceptions of favoritism stemming from her friendship with Owen, and despite what she said was advice from DOE's general counsel that a recusal was not necessary, Gault did recuse herself in July from all matters relating to NPR technologies.

Gault also said she recused herself at the same time from any matter relating to Lockheed Corp., due to a separate friendship with a lobbyist for that firm whom she declined to name. She noted that Lockheed is expected to bid for environmental remediation management contracts at several of DOE's cleanup sites. Lockheed Engineering & Sciences Co. is also listed among clients of Owen's firm.

"I have never been asked by either [Owen or the Lockheed lobbyist] to do anything improper for them," Gault asserted. Her recusals "went way beyond requirements" of government ethics laws, she insisted, because she had no financial interest in either case.

Gault also denied that Watkins' Nov. 1 decision to postpone the selection of an NPR technology and site had anything to do with his anger at Sen. Sam Nunn, D-Ga., chairman of the Armed Services Committee, as several publications have reported. "It's absolutely not true" that the postponement of up to two years was related to Watkins' unhappiness with proposed language in the Defense Dept. authorization bill that would have delayed Rocky Flats and Savannah River restart activities, she said.

Watkins, Gault said, had concluded after "10 to 15" meetings on the EIS and the candidate technologies, and as a result of President Bush's September announcement of dramatic nuclear arms reductions, that he was not ready to make an NPR decision. The timing of the NPR delay announcement, one day after Watkins fired off an angry letter to Nunn, was due to Watkins' desire to suspend the EIS process prior to the scheduled selection of a preferred technology and site late this month.

Gault also denied that Dominic Monetta, former director of the Office of New Production Reactors, had been fired or told to resign by Watkins, as several published reports have indicated. She said Monetta submitted his resignation on his own because he was "unhappy that the [NPR EIS] process was delayed."

— David Kramer

ATLANTA UTILITY ATTACKS DOE FOR COMMENTS ON INDUSTRIAL BYPASS PLAN

A natural gas utility in Georgia has denounced DOE for what it called "an off-the-record attempt to influence" a Federal Energy Regulatory Commission proceeding in which FERC refused to order an interstate pipeline to connect with a manufacturing plant. Atlanta Gas Light Co. urged the commission to reject a suggestion by DOE that it reconsider its decision.

DOE immediately defended its handling of the matter. A department official said it would continue to look for other regulatory cases in which it can promote objectives of the Bush administration's national energy strategy.

Meanwhile, FERC issued a notice Thursday giving parties interested in the case until Dec. 3 to comment on DOE's position.

DOE's overture in a case involving Arcadian Corp., a New Jersey-based fertilizer producer, was one of two agency attempts to champion energy strategy goals by taking stands on individual regulatory cases (IE/FL, 18 Nov. 6). The department argued that Arcadian's attempt to arrange a direct link between its Augusta, Ga., plant and the Southern Natural Gas Co. pipeline system represented the type of competitive transactions advocated in the administration's strategy.

Southern refused to provide the connection, a move supported by Atlanta Gas Light, which would otherwise lose its sales to the plant. Arcadian then appealed to FERC, but was turned down by the commission in May.

"Atlanta strongly condemns this *ex parte* communication," the utility said of the Nov. 7 letter sent to FERC by Deputy Secretary W. Henson Moore. "Not only does such an off-the-record attempt to influence the Commission violate the Commission's Rules of Practice and Procedure, and the Department of Energy Organization Act, but it denies the due process procedural protections of the Fourteenth Amendment," the utility said in a Nov. 15 filing at FERC.

Atlanta Gas Light acknowledged that FERC rules allow DOE to comment to the commission on proceedings in which the department has "no official interest," but it contended that Moore's letter "by no means falls within this safe harbor exception." It added: "The letter is a flagrant attempt to coerce the Commission into changing its original decision." Atlanta Gas Light also complained to FERC that to the best of

A Book of Nonsense

EDWARD LEAR



There was an Old Person of Bromley,
Whose ways were not cheerful or comely;
He sate in the dust,
Eating Spiders and Crust,
That unpleasing Old Person of Bromley.

LOOKING GLASS LIBRARY
DISTRIBUTED BY RANDOM HOUSE, INC.
NEW YORK

Ahan,

131

Crusts are O.K. but no
spiders please!

See you on 12/11/91 at noon

Howard

"Document Control"

TYPE: MEETING REQUEST DOCUMENT NUMBER: 9124979
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: MERRIFIELD, D. Bruce: WHARTON SCHOOL, UNIVERSITY OF PENNSYLVANIA

TO: DR. D.A. BROMLEY

DATE OF CORRESPONDENCE: 11/25/91

SUBJECT: HE REQUESTS TO MEET WITH DR. BROMLEY REGARDING SOME SORT OF PRO-ACTIVE CIVILIAN TYPE DARPA WHICH IS NOT MISSION LIMITED, BUT WOULD BE MANAGED AND OPERATED IN THE PRIVATE SECTOR.

DIRECTORATE STAFF
ASSIGNED: DIRECTOR'S OFFICE ASSIGNED:

ACTION STAFF
REQUIRED: AS APPROPRIATE ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: 12/17/91 STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: PHYSICAL SCIENCES
INDUSTRIAL
D. Allan Bromley

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

CLOSED

OSTP RECEIVED: 12/03/91
FILE: PHYSICAL SCIENCES
CENTRAL FILES: *Pres*

DEPT RECEIVED:



The Wharton School of the University of Pennsylvania

4979
Sol C. Snider
Entrepreneurial Center
Vance Hall 4th Floor
3733 Spruce Street
Philadelphia, PA 19104-6374

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91 DEC 3 P 4: 17
November 25, 1991

(215) 898-4856
FAX: (215) 898-1299

OSTP
MAIL ROOM

Dr. D. Bruce Merrifield
Walter C. Bladstrom
Visiting Executive
Professor of
Entrepreneurial Management

The Honorable D. Allan Bromley
Director
Office of Science and Technology Policy
Old Executive Office Building, Room 176
17th and Pennsylvania Avenue, NW
Washington, DC 20500

Dear Allan:

Since "escaping" from the Commerce Department in 1989, I've been participating with an ad-hoc group (see attached list) to promote "precompetitive, generic, critical technologies" -- such as the High Performance Computing Initiative. In particular, we've been working behind the scenes with people on the Hill to understand the need for some sort of pro-active civilian-type DARPA which is not mission-limited like DARPA, but would be managed and operated in the private sector.

We would much appreciate your thoughts along this line, and General Bernard Schriever, Admiral William Hauser, General Burt Edelson, Jim Fletcher and I would like to meet with you for your guidance. I'll check in with your office, in a few days to see if you may have an opening on your schedule.

If you have questions, the best place to reach me is my Washington office at the American Electronics Association (202/682-9110).

Sincerely,

DBM:efs

Attachments

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2 May 1991

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U. S. INDUSTRIAL COMPETITIVENESS
FUNDING OF HIGH-RISK LONGER-TERM INVESTMENTS
IN NEXT-GENERATION "CRITICAL TECHNOLOGIES"

Rationale

U. S. industrial competitiveness in a hyper-competitive global marketplace increasingly will depend upon accelerated conversion of basic research discoveries (where the U. S. has a commanding lead), into generic technologies which are advanced to the point where industrial firms can further develop them and commercialize leading edge products, processes and services. The \$24 billion of annual basic research investments now being made in the U. S. are 10 times greater than any other nation has the in-place capability to duplicate --- resulting in most of the Nobel Prizes and most of the scientific break-throughs for U. S. laboratories.

However, these seminal discoveries are far from commercialization. Most of the eventual cost and risk of development is still ahead, and often beyond the capacity of most companies to undertake alone. Barriers to this technology-transfer and the further development process, so urgently needed, include bureaucratic regulations, a lack of industrial experience in university and Government lab personnel responsible for transfer, and above all, a lack of availability of risk capital at justifiable costs, for early stage investments, where ultimate commercial potentials are still nebulous.

Current Sources of Funding

The Federal Government currently funds about \$70 billion in R&D, of which about 80% is contracted out to private sector laboratories. However, this work largely is mission-restricted, and may or may not have industrial (dual-use) potential.

For mission-restricted work, the Government is the built-in customer and the technology transfer process, therefore, is built-in. However, for industrial uses the transfer of technology process is weak to non-existent, even though the authorization through the Technology Transfer Acts and through specific Presidential directives¹ has been in place for many years! Also, except for DARPA, the Government funding process has been through grants and procurement contracts, and tends to be reactive rather than pro-active in seeking out next-generation possibilities --- a critical deficiency!

The Advanced Technology Program (ATP) at Commerce is a recent departure, in that it is not mission-restricted, and the Government is not the primary customer. Also, it requires shared funding with industry, but funding still is very limited, relative to demand, and the process still is reactive rather than pro-active. Finally, the ATP program does not have authorization to fund

¹ See attached table of authorizations and directives.

research in universities or Government labs, where much of the nation's best technical talent is located, and where the seminal discoveries are being made that need risk capital to begin the transfer process.

DARPA is a unique Government agency which has annual funding of about \$1.3 billion, and is an exception in that it is pro-active. DARPA has no labs of its own, and therefore contracts out all funds to the best sources of talent and capabilities --- wherever they may be in large or small organizations, Federal laboratories, universities, corporations, or consortia. Nevertheless, it still is mission-restricted to military needs, and only recently has had limited authorization to be involved in collaborative R&D arrangements.

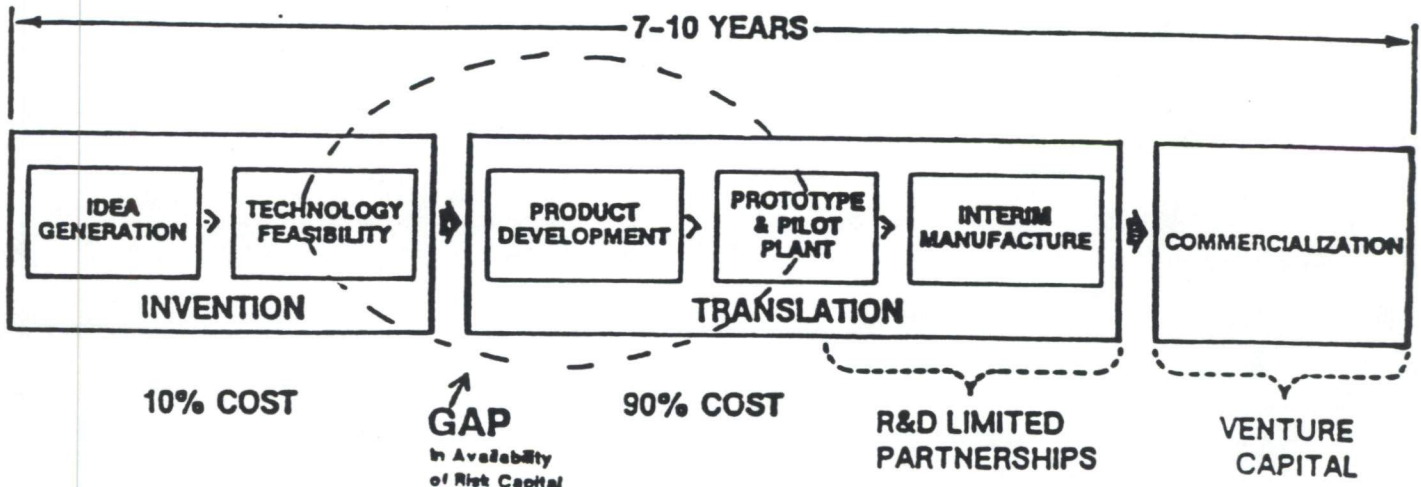
DARPA, however, has been remarkably successful in its operation, particularly in generating generic technologies which have had enormous industrial value --- computing, telecommunications, electronics, and advanced materials. DARPA has had highly competent personnel on its staff who operate with great flexibility. It has been very aggressive in searching out innovative ideas, talented people, and capable organizations --- and has been able to fund these at appropriate levels. It has been able to short-circuit the bureaucratic process to start promising new projects quickly, and then terminate those that appear less attractive. This combination of power, talent and flexibility is lacking in all other Government research organizations (DOD, NASA, DOE, NSF, etc.). There is no civilian equivalent.

Possible Solutions to the Need for a Civilian "ARPA"

A civilian "ARPA" modeled on DARPA but without mission-restrictions and with a strong market focus, could provide the missing pro-active initiative needed to more effectively exploit the dominant U. S. advantage in basic research. The fundamental understanding here (Exhibit I) is that once a

EXHIBIT I

INNOVATION PIPELINE



basic discovery is made (Boxes I and II), about 90% of the cost, time and risk still lies ahead in translating that discovery (Boxes III, IV and V) into something useful (Box VI). Moreover, currently the high-risk early-stage seed funding (the bridge between Boxes II and III) has simply not been available.

This is the gap that DARPA bridges so effectively, and is missing for non-military opportunities. A pro-active market-focused industry-managed and led "ARPA" could take a number of different forms (Exhibit II):

EXHIBIT II

FUNDING MODELS FOR CRITICAL TECHNOLOGY
DEVELOPMENT

<u>Organizational Form</u>	<u>Funding Source</u>	<u>Staff Factors</u>	<u>Labs Owned</u>	<u>Degree of Independence</u>	<u>Program Initiative</u>
● Govt. Agency	Budget Appropriation	Civil Service	Problem?	Limited Flexibility	Reactive
● Govt. Corp.	Endowment Plus Funding	Small Independ.	None	Somewhat Limited	Reactive
● Private Sector	Self-Funding	Small Independ.	None	Very Good	Pro-Active

All three models above are feasible, but each has advantages and disadvantages: A Government Agency might be established under the Technology Administration at Commerce or in DOE, funded by Congress, and staffed by civil service personnel, employing Government contracting procedures --- the sum total of which would effectively limit the pro-active flexibility desired. Politically, however, it may be necessary to build on existing capabilities rather than create something new. DARPA operates under somewhat similar restrictions, to those above, except that it has the advantage of having a built-in customer, with massive funding, operating against clearly defined requirements (any dual-use opportunities are a side-benefit).

A Government Corporation might operate as a Federally funded R&D center (FFRDC), which would be established with an endowment. The operating latitudes would include ability to fund R&D work in both Government and private sector labs. The Government would retain a good deal of control through ownership, but the corporation would operate outside the civil service framework, and therefore could command a level of management competence and flexibility much greater than that in a Government agency. Industrial interests and market focus might be integrated in some degree through industrial participants on an advisory board.

A Private Sector organization might take the form of a corporation or Limited Partnership, which could have maximum flexibility and access to the highest level of technical competence. The Government would lose a measure of control to private interests, but it still might retain considerable influence by inserting policy guidance in its charter, or by acting as a private investor or customer in the enterprise. However, the organization might not always work in ways consistent with the views of Government agencies, even becoming competitive with Government programs, or with industrial firms as well. As a private sector organization, it could become self-funding through royalties, or by taking equity positions in successful developments. If established as a Limited Partnership, it would provide incentives for investment by companies, by pension funds, by venture capital funds or by syndicated groups of individual investors.

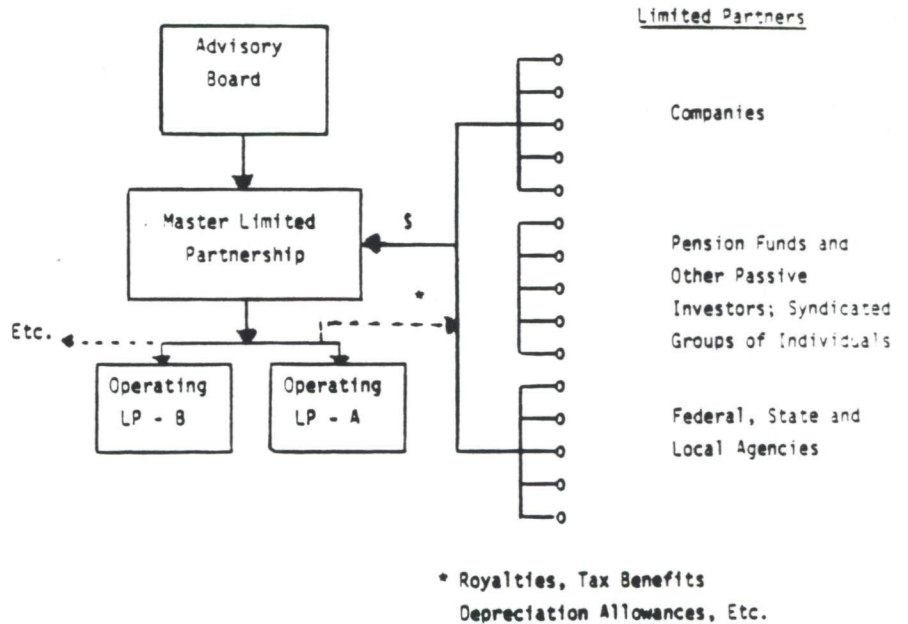
If modeled after COMSAT, the organization would be Government-chartered, but privately funded and staffed. The Government would have the opportunity, and might agree at the beginning, to invest in the corporation, or be a supplier to or a customer of the corporation. Staff competence and pro-active flexibility would be assured.

The Limited Partnership organizational model is of particular interest for a private sector operation of this sort (Exhibit III). In this model, the limited partners (far right)

can include companies as well as Government agencies and passive investors such as pension funds. Limited partners are insulated from liability and antitrust concerns by this organization (properly structured), which has been much used, and is well documented. Profits from successful developments flow back to the limited partners (without double taxation as in a normal corporation) but proportional to their initial investment. This allows disproportionate investments to be made from any source. Also, depreciation allowances, and any other tax benefits automatically flow back to the limited partners. The master partnership retains the pro-active flexibility to seek out leading edge investment opportunities which are set up as sub-limited partnerships and can have additional limited partners if desired.

EXHIBIT III

Limited Partnership Management Model



Eventually, a successful development can be spun off to the limited partners, can go public as a new company (providing liquidity for the investors), or can be operated as a "cash cow" for further investments.

Summary

The U.S. retains a commanding lead in basic research which will continue to result in Nobel Prizes and most of the next-generation seminal discoveries. However, these discoveries often have remained latent in university and Government laboratories, because of bureaucratic impediments, lack of experience in the technology transfer process, and most importantly, the lack of low cost risk capital.

The remarkable success that DARPA has experienced for military needs over the last 30 years, could be replicated in the civilian sector by a similarly constituted pro-active organization, whose mission would be one of catalyzing the process needed to exploit the U.S. advantage in basic science. This advantage is not questioned, but the follow-through has been limited, providing opportunities for other nations to cherry-pick the best discoveries for subsidized development.

Several types of feasible organizations are outlined above which might provide the needed capabilities. However, more important than the form of organization, is the clear recognition of the problem, and the elements that constitute the problem. U.S. industrial competitiveness increasingly will be dependant upon solutions to this problem.

THE WHITE HOUSE

WASHINGTON

December 18, 1991

Dear Bruce:

I remember with great pleasure the occasion when Joe Weneser, Herman Feshbach and I visited you during your stay at Commerce and we were delighted to find that, among a great many people with whom we talked during those travels, you were the only person whom we felt fully understood what we had in mind.

I am, of course, aware of your continuing efforts to promote precompetitive technologies and have welcomed that support because I really do feel that we have an enormous opportunity that could be tremendously beneficial to the country and, at the same time, an opportunity that we could very easily lose.

I would be happy to talk with the distinguished group that you mentioned in your letter of November 25 and will look forward to hearing from you. My telephone number is 202/456-7116.

You mentioned the need for a civilian-type DARPA and I do have some concerns about such an organization. In my view, the reason that DARPA has been as successful as it has been is in significant measure because it was always extremely clear who the ultimate customer was--the Defense Department. I am concerned that, given the present tendency toward pork activities in the appropriations committees, a civilian DARPA would very quickly be looked on as the happy hunting ground for such activities and I am worried that further departure from a focus on excellence and clear mechanisms for quality evaluation, peer review, and the like will seriously damage our overall science and technology enterprise.

I look on the advanced technology program out of NIST as something of a pilot program and must say that I have been very pleased by the first series of awards and very supportive of an expansion of that program.

In any event, I would look forward to talking with you and your colleagues as would a number of my senior associates, so please do give me a call so that we can arrange to get together.

In the meantime, let me wish you a very merry Christmas, and a happy and healthy 1992.

Sincerely yours,

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

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

Dr. D. Bruce Merrifield
Snider Entrepreneurial Center
Wharton School
University of Pennsylvania
Vance Hall 4th Floor
3733 Spruce Street
Philadelphia, Pennsylvania 19104

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TYPE: INFORMATION DOCUMENT NUMBER: 9125007
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FROM: KRANE, Kenneth S.: OREGON STATE UNIVERSITY

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 11/22/91

SUBJECT: HE IS FORWARDING A COPY OF HIS LETTER TO DR. TOWNES
REGARDING THE PROPOSED 10% BUDGET CUTS IN THE
NUCLEAR SCIENCE PROGRAMS AT DOE.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

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

COPIES TO: D. Allan Bromley
PHYSICAL SCIENCES

WHITE HOUSE TRACKING #: CONTACT PERSON:
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OREGON
STATE
UNIVERSITY

Weniger Hall 301
Corvallis, Oregon
97331-6507

November 22, 1991

Professor Charles H. Townes
Chair, SEAB Task Force
Physics Department
557 Birge Hall
University of California
Berkeley, CA 94720

Dear Professor Townes:

We were shocked and dismayed to learn of the proposed 10% cut in the FY93 budget of the nuclear science programs of the Department of Energy.

Perhaps no other group in the scientific community has been as responsible as the nuclear scientists in the wise and careful use of its resources. As a community, we have repeatedly faced the problems of terminating funding for facilities that have contributed substantially to the field but that have passed their era of primary contributions at the forefront of research. Our community has wrestled with these painful decisions and taken these necessary actions only after significant public discussion of the impacts and alternatives. It was therefore especially disappointing to learn of these proposed reductions in addition to the orderly but already significant phase-outs recently recommended by NSAC.

We are especially concerned with reports that these funds are being stripped from the research budget in order to fund other DOE programs, including SSC and the facilities clean-up. The national support of the scientific community for the SSC has been based on the assurance that funding for its construction and operation would not come at the expense of other ongoing DOE research programs. The proposed action by DOE suggests that this is no longer the case.

Telephone
503-737-4631

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503-737-1683



OREGON
STATE
UNIVERSITY

With RHIC, CEBAF, and KAON becoming realities, there is the promise of an exciting decade for nuclear science. Secure funding for University researchers in theory and experiment will attract new graduate students into the field. The hiring and support of junior faculty will maintain the vitality that has characterized our field in previous decades. These proposed draconian budget reductions, however, send a signal to young researchers that this is not a field in which support for research is likely to be found in the future. The resulting damage to our field will be catastrophic and irremediable, affecting not only nuclear science itself but a host of allied fields, including developments in computational techniques, nuclear medicine, energy policy, and environmental preservation.

This reduction comes at a time when research costs are rising particularly rapidly. Those who travel to accelerators for their research are suffering from the doubling of air fares in recent years. Substantial tuition increases at both public and private universities have put additional strains on research budgets. Increases in recent years have been insufficient even to keep pace with inflation. The deteriorating infrastructure of our research facilities has been well documented in studies by NSF. Even a level budget scenario means a considerable scaling back of our research activities.

At our University, research in nuclear science involves the undersigned faculty plus more than a dozen graduate students and at least as many undergraduates. Our researchers have not only produced significant contributions to the field of nuclear science, but have also shared their expertise with other researchers on campus. Our computational group is the campus leader in applying computers to the solutions of complex problems, and we have developed new graduate and undergraduate courses that teach these techniques to a broad spectrum of students. Our experimental group has shared its skills with researchers in other fields such as solid-state physics, which has now become the leading research group in the U.S. in applying nuclear techniques to the study of such problems as defects in solids and high-temperature superconductivity. In recent years our highest University award for research in basic science has gone to one theoretical nuclear scientist and two experimentalists from other fields who use nuclear techniques in their work. Our impact on students in the basic and applied sciences thus goes far beyond the boundaries of nuclear science.

We respectfully urge you to consider the impacts of these proposed reductions in the DOE budget and to provide opportunity for the nuclear science community to respond to these proposals in the orderly fashion that has characterized its response to previous budgetary crises.

Sincerely yours,



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