



COUNCIL FOR THE ADVANCEMENT OF SCIENCE WRITING, INC.

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# **NEW HORIZONS IN SCIENCE**

## **Twenty-Second Annual Briefing**

October 28 through November 1, 1984  
Golden Gateway Holiday Inn  
San Francisco, California

Supported by:

The University of California Medical Center, San Francisco  
The University of California, Berkeley

Co-Chairmen:

David Perlman

Ben Patrusky

**SUNDAY, OCTOBER 28**

**6:00 P.M. to 9:00 P.M.**

Registration & Reception, Golden Gateway Holiday Inn

**MONDAY, OCTOBER 29**

**8:30 A.M. to 11:00 A.M.**

### **A NEW WAR ON TROPICAL DISEASES**

Adetokunbo Lucas, M.D., Director, Special Research Program  
in Tropical Diseases, World Health Organization, Geneva

By applying the fruits of modern biotechnology, scientists are making significant inroads against malaria, river blindness, African sleeping sickness, leprosy and several other dreaded health scourges.

### **GENE ENHANCERS**

Keith R. Yamamoto, Ph.D., Professor of Biochemistry and  
Biophysics, University of California, San Francisco

Enhancers appear to use a novel mechanism to increase specific gene activity. When linked to a gene they boost production of a protein product by as much as a thousand-fold. They may prove to be the key to the puzzle of cell differentiation.

**2:30 P.M. to 5:30 P.M.**

### **AGRICULTURAL ENGINEERING**

Michael Freeling, Ph.D., Professor of Genetics, University of  
California, Berkeley

John Bedbrook, Ph.D., Scientific Director, Advanced Genetic  
Sciences, Oakland

There are two new major approaches to improving crop productivity: introducing new genes into plants (Freeling) and altering the genetics of microorganisms living in intimate association with plants (Bedbrook). Dramatic strides have been made in both arenas.

## **MARINE BIOTECHNOLOGY**

Daniel E. Morse, Ph.D., Professor of Molecular Genetics and Biochemistry, University of California, Santa Barbara

Recent advances in genetics and biochemistry open the way to enhanced exploitation of marine resources by way of increased harvest of important food species, potent new products of immense potential benefit to clinical medicine, and stepped-up energy and metal production. The products include newly discovered regulators of pain, reproduction and brain activity.

**6:00 P.M. to 8:00 P.M.**

Hospitality Suite Open

**TUESDAY, OCTOBER 30**

**8:30 A.M. to 11:30 A.M.**

### **"SUICIDE ENZYMES"**

Paul R. Ortiz de Montellano, Ph.D., Professor of Chemistry, Pharmaceutical Chemistry and Pharmacology, University of California, San Francisco

A drug-design strategy, referred to as the Trojan-horse alternative, is fast approaching the commercial stage in medicine and agriculture. These agents become activated only after they have entered biological systems and been cleaved by natural enzymes. The newly come-to-life chemicals then destroy activating enzymes, bringing on their own self-destruction in the process.

### **IN SEARCH OF MEMORY**

Larry R. Squire, Ph.D., Professor of Psychiatry, University of California School of Medicine, La Jolla, and Veterans Administration Medical Center, San Diego

Research conducted in recent years has generated a raft of new information about how and where memory gets stored in the brain. The collective evidence suggests that the nervous system is organized around two distinct kinds of memory, "event" or "fact" memory and "skill" memory.



**TUESDAY, OCTOBER 30**  
**2:30 P.M. to 5:30 P.M.**

### **MEDICAL IMAGING WITH SYNCHROTRON RADIATION**

Edward Rubenstein, M.D., Associate Dean and Professor of Medicine, Stanford University School of Medicine, Stanford

The radiation emitted by electrons whirling around storage rings at near-light speeds has made non-invasive coronary arteriography a reality. Having established that the technique is capable of creating excellent X-ray images of heart vessels in animals, scientists are ready to begin human trials.

### **FRACTALS: NATURE'S GEOMETRY**

Benoit B. Mandelbrot, Professor of the Practice of Mathematics, Harvard University, Cambridge, and IBM Fellow, Thomas J. Watson Research Center, Yorktown Heights, N.Y.

This new geometry gives mathematical definition to the "random" shapes and patterns of mountains, trees, coastlines and clouds. It has been found to have practical application in scientific disciplines from chemistry to cosmology, oceanography to meteorology, statistical physics to geophysics.

**6:30 P.M.**

### **ANNUAL BANQUET**

Banquet Speaker: Alan Dundes, Ph.D., Professor of Anthropology, University of California, Berkeley, on *Folklore in the Modern World*.

Presentation of the 1984 National Association of Science Writers' Science-in-Society Journalism Awards.

**WEDNESDAY, OCTOBER 31**

**8:30 A.M. to 11:30 A.M.**

**SCIENCE POLICY '84: THE REAGAN & MONDALE  
AGENDAS**

George A. Keyworth II, Ph.D., Science Adviser to the President, Office of Science and Technology Policy, Executive Office of the President, Washington, D.C.

(Spokesperson for the Mondale campaign had not been designated at the time this program went to press.)

On the eve of the national election, the speakers will describe what the federal science and technology policy is likely to be under the Reagan or Mondale administrations.

**THE LINK BETWEEN THE MACROCOSMOS & THE  
MICROCOSMOS**

Marc Davis, Professor of Astronomy and Physics, University of California, Berkeley

There is a cosmic connection between the structure of the universe on the largest scale and the structure of matter on the smallest scale.

**2:30 P.M. to 5:30 P.M.**

**THE INFRARED SKY**

Charles A. Beichman, Ph.D., Senior Scientist, Jet Propulsion Laboratory, Pasadena

The data gathered by the Infrared Astronomical Satellite (IRAS) has provided scientists with a breathtaking new view of space.

## **WHEN HEAVY IONS COLLIDE AT VERY HIGH ENERGY**

Howel G. Pugh, Ph.D., Scientific Director, Bevalac, Lawrence Berkeley Laboratory, University of California, Berkeley

For now, Bevalac is the only machine in the world that can accelerate heavy ions, such as the nuclei of uranium atoms, to 95% of the speed of light. By hurling these ions at target nuclei, researchers hope to shed brighter light on the fundamental composition of neutrons and protons. Collisions to date have yielded a number of unusual products, including the controversial "anomalons," which may represent a new form of nuclear matter.

**6:30 P.M.**

Cocktail Reception at the San Francisco Aquarium

**THURSDAY, NOVEMBER 1**

**8:30 A.M. to 12 NOON**

## **U.S. TECHNOLOGY: THE NEXT DECADE**

William J. Perry, Ph.D., Executive Vice-President, Hambrecht & Quist, Inc., San Francisco

The former Under Secretary of Defense in the Carter administration takes a hard, objective look at the realities America must face as it considers its technological future in both the military and commercial spheres.

## **SUPERCOMPUTERS**

James C. Browne, Professor of Computer Sciences and Physics, University of Texas at Austin

Future progress in computer design will involve a shift from computation in which calculations are performed one after the other to computation in which many parallel computations are performed simultaneously. The new architecture lies at the heart of the U.S.-Japanese battle for computer superiority.

## **BAT EC(H)OLOGY**

James A. Simmons, Ph.D., Professor of Biology, Institute of Neuroscience, University of Oregon, Eugene

Scientists continue to make strides in translating the "vocabulary" of bats and learning how their ultrasonic signals for prey capture and navigation relate directly to the habitats in which they dwell. The work has led to development of new information-processing equipment for use in clinical medicine.

## **ADJOURNMENT**



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