



A BRIEFING
ON
NEW HORIZONS IN SCIENCE

By the
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The Massachusetts Institute of Technology

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Monday, November 11th
through
Friday, November 15th

1963

MONDAY, NOVEMBER 11, 1963

at the House of the American Academy of Arts and Sciences

MOLECULES, MICROSCOPY AND MEDICINE

MOLECULAR BIOLOGY

Howard K. Schachman
University of California
Berkeley

ELECTRON MICROSCOPY

Don W. Fawcett
Harvard

MEDICINE AS MEDICAL BIOLOGY

Bert Vallee
Harvard (Peter Bent Brigham)
Chairman

Warren Wacker
Harvard (Peter Bent Brigham)

TUESDAY, NOVEMBER 12, 1963

at the House of the American Academy of Arts and Sciences

EARTH, SPACE AND ATMOSPHERE

SUN-EARTH ENVIRONMENT

Thomas Gold
Cornell

WEATHER — EARTH, PLANETS

S. Fred Singer
U. S. Weather Bureau

SPACE ASTRONOMY

Fred Whipple
Harvard
Chairman

Dinner at the Museum of Science, Boston

Speaker — Edwin H. Land, Polaroid Corporation

"Studies on the Determinants of Color"

WEDNESDAY, NOVEMBER 13, 1963

at the Penthouse, Faculty Club,
Massachusetts Institute of Technology

SCIENCE AND THE NEW ENGINEERING

Athelstan Spilhaus
Institute of Technology
University of Minnesota
Chairman

Gordon Brown
Massachusetts Institute of Technology

W. A. MacNair
Bell Telephone Laboratories

Luncheon at the Faculty Club
Massachusetts Institute of Technology

Afternoon — Visits to laboratories

National Magnet Laboratory
Massachusetts Institute of Technology

Laboratory of B. F. Skinner
Harvard

Laboratory of Jerome S. Bruner,
Harvard

THURSDAY, NOVEMBER 14, 1963

at the House of the American Academy of Arts and Sciences

MAN IN EVOLUTION

THE NEW PREHISTORY OF MAN

William W. Howells
Harvard

THE EVOLUTION OF PEOPLES

Ernst Mayr
Harvard
Chairman

BIOLOGY AND CULTURE

Irven DeVore
Harvard

FRIDAY, NOVEMBER 15, 1963

at the House of the American Academy of Arts and Sciences

BIOPHYSICS, THE BRAIN AND LEARNING

Peter Elias

Massachusetts Institute of Technology
Chairman

Alex Bavelas

Stanford University

Walter Rosenblith

Massachusetts Institute of Technology

Arthur L. Samuel

Massachusetts Institute of Technology

Short Biographies of Speakers

ALEX BAVELAS has been Professor of Psychology at Stanford University since 1958. Before that he was with Bell Telephone Laboratories, working on research in social communication. He has been professor at M.I.T. and a Fellow at the Center for Advanced Study in Behavioral Sciences at Stanford. He has written a number of papers, particularly on communication in task-oriented groups and on experimental group psychology, including one in Harpers, in July 1955, on "How To Talk To The Boss." He received his Ph.D. in group psychology from M.I.T. in 1948.

GORDON S. BROWN, Dean of the School of Engineering at M.I.T., has been responsible for revolutionary advances in engineering education. He was the first director of the Servomechanisms Laboratory, which was established in 1941 to develop complex apparatus for controlling guns and which pioneered in the digital control of machine tools. As head of the Department of Electrical Engineering for seven years, he made changes in curriculum and methods that had a profound effect on the education of electrical engineers throughout the country. Since becoming Dean in 1959 he has been the leader in an even more extensive program of revision in the School of Engineering.

IRVEN DEVORE, Lecturer on Anthropology at Harvard, has spent a year in Kenya observing and photographing the social behavior and organization of baboons. His findings bear on the problem of the evolutionary origins of human social organization.

PETER ELIAS, Head of the Department of Electrical Engineering at M.I.T., attended Swarthmore College, graduated from M.I.T. and received two master's degrees and a Ph.D. from Harvard University, where he continued his studies at Lowell Prize Fellow. He joined the M.I.T. faculty in 1953 and in 1960, at the age of 36, became head of the Department of Electrical Engineering. He is an authority on information theory and has made notable contributions in coding theory.

DON WAYNE FAWCETT, Harvard's Hersey Professor of Anatomy, James Stillman Professor of Comparative Anatomy, Head of the Department of Anatomy and Curator of the Warren Anatomical

Museum, is an outstanding medical scientist who has explored a myriad of anatomical problems at sub-cellular and molecular levels. He is one of the leaders in the field of electron microscopy.

THOMAS GOLD, a native of Vienna, is chairman of the Department of Astronomy at Cornell and Director of the Center for Radiophysics and Space Research. He was in on the original research and development of radar for the British admiralty. He has taught at Harvard and is a Fellow of Trinity College, Cambridge.

WILLIAM W. HOWELLS, Professor of Anthropology at Harvard, is an authority on racial and body types and on human evolution. His books include "Mankind So Far," "The Heathens," "Back of History," and "Mankind in the Making." Professor Howells is former President of the American Anthropological Association; in 1954 he was awarded the Viking Fund Medal in Physical Anthropology.

EDWIN H. LAND, President and Director of Research of Polaroid Corporation, Cambridge, Massachusetts, has specialized in the interaction of light and matter, particularly in the fields of light polarization and optics, photography, color, and radiation detection and recording. He is most widely known for his 1947 invention of the one-step photographic process yielding instant finished pictures and this year, 1963, for his instant color pictures. He is a member of many learned societies; holds approximately 250 U. S. patents, solely or jointly; and has had articles published in many of the scientific journals.

WALTER A. MACNAIR, Vice President in charge of Transmission Switching Development at Bell Telephone Laboratories, joined the Bell System in 1929 and has specialized in research and development in fields of acoustics, switching, and military equipment at both Bell Laboratories and Sandia Corporation. He holds a B.S. degree from Colgate University, a Ph.D. from The Johns Hopkins University. He was a national research Fellow from 1925 to 1927 and is a Fellow of The American Physical Society and the Acoustical Society of America.

ERNST MAYR, Alexander Agassiz Professor of Zoology at Harvard, is one of the key contributors to modern evolutionary theory, his latest work being "Animal Species and Evolution." As Director of

Harvard's Museum of Comparative Zoology, he heads one of the major centers of natural history research in the United States. Professor Mayr is also an accomplished ornithologist and is noted for his writings on the bird life of the South West Pacific and the East Indies.

WALTER A. ROSENBLITH, professor of communications biophysics at M.I.T., was born in Vienna, was graduated from the University of Bordeaux and in 1939 came to the United States. He joined the M.I.T. faculty in 1951 after four years in the Psycho-Acoustic Laboratory at Harvard and has been a leading researcher in studies combining electrical engineering, mathematics and physics with neuro-physiology and psychophysics to learn more about the processes by which organisms carry on sensory communication with their environment.

ARTHUR L. SAMUEL, visiting professor of electrical engineering at M.I.T. this year, is on leave as consultant to the IBM director of research at the Thomas J. Watson Research Center in Yorktown, N. Y. He has been a pioneer in computer research involving machine learning and artificial intelligence and is probably best known to the lay press for his work in programming computers to play checkers. He is closely associated at M.I.T. with Project MAC, a program for the development of advanced computer systems.

HOWARD K. SCHACHMAN has been professor of biochemistry and virology at the University of California since 1959. He has studied at the Massachusetts Institute of Technology, Harvard and Princeton. He is editor of the Archives of Biochemistry and Biophysics. His particular interests are the chemistry of viruses, nucleic acids and proteins and the development and application of the ultracentrifuge.

S. FRED SINGER is the first director of the recently established National Weather Satellite Center (NWSC) in the U. S. Dept. of Commerce, Weather Bureau, on leave from the University of Maryland. Set up to establish and operate the National Operational Meteorological Satellite System (NOMSS); NWSC also conducts research in satellite meteorology and its applications; and it provides support to manned space flight operations through terrestrial and

space weather forecasting. One of America's leading space physicists, Dr. Singer is a pioneer in space research and the author of over two hundred scientific publications.

ATHELSTAN S. SPILHAUS, Dean of the Institute of Technology, University of Minnesota, is a meteorologist and oceanographer with a great interest in the communication of science to the public. He was the Commissioner of the United States Science Exhibit at the Seattle World's Fair, and is a member of the Scientific Advisory Committee of the American Newspaper Publishers Association and the author of several comic strips on science.

BERT L. VALLEE, Associate Professor of Medicine at the Harvard Medical School, Physician at the Peter Bent Brigham Hospital and Director of Harvard's Biophysics Research Laboratory at the Peter Bent Brigham, has pioneered in research related to the roles played by metallo-enzymes in cell metabolism in man. Dr. Vallee, who is also on staff at the Massachusetts Institute of Technology, came to Harvard Medical School in 1949.

WARREN E. C. WACKER, Assistant Professor of Medicine at Harvard, Senior Associate in Medicine at the Peter Bent Brigham Hospital and a close associate of Dr. Vallee's in the Biophysics Research Laboratory, has made brilliant contributions to the early diagnosis of kidney cancer and heart disease. Dr. Wacker has been associated with the Peter Bent Brigham Hospital and the Harvard Medical School since 1953 and 1955, respectively. Since 1957 he has also been an Investigator of the Howard Hughes Medical Institute.

FRED L. WHIPPLE is Professor of Astronomy at Harvard and an authority on asteroids, meteors and comets. As Director of the Smithsonian Astrophysical Observatory in Cambridge, he heads a team of scientists and amateur observers who optically track artificial earth satellites. Dr. Whipple has discovered six comets and has developed two widely-held hypotheses: that comets are composed of icy and earthy materials; and that a dust belt exists around the earth. He is the author of "Earth, Moon and Planets" and other popular works on astronomy.

Participants

RICHARD ANDREWS
Corning Glass Works

ROY AVERY
American Chemical Society

JULES BERGMAN
ABC-TV

GEORGE PACKER BERRY
Harvard Medical School

LEONARD BERTIN
Toronto Star

JERRY BISHOP
Wall Street Journal

ALTON BLAKESLEE
Associated Press

HARVEY BROOKS
Harvard University

WARREN BURKETT
Houston Chronicle

ROBERT BYERS
M.I.T. News Service

ROBERT CHRISTOPHER
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BLAIR CLARK
Columbia Broadcasting System

VICTOR COHN
Minneapolis Tribune

THOMAS COONEY
The Ford Foundation

ROBERT C. COWEN
Christian Science Monitor

WATSON DAVIS
Science Service

JOHN DIEBOLD
Raytheon Company

DAVID DIETZ
Scripps-Howard

A. H. DRUMMOND, Jr.
Science and Math Weekly

ARMAND ERPF
Loeb, Rhoades and Co.

CHARLES FLATO
Medical World News

LOIS GARDNER
Bulletin of the Atomic Scientists

ROGER C. GREENHALGH
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NATE HASELTINE
Washington Post

BEN W. HEINEMAN
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HILLIER KRIEGHBAUM
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JONATHAN LEONARD
Time Magazine

JOSEPH LUBIN
Voice of America

MARGARET MAHONEY
Carnegie Corp. of New York

IAN MENZIES
Boston Globe

JEAN PEARSON
Detroit Free Press

HARRY PEASE
Milwaukee Journal

THOMAS L. PHILLIPS
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WILLIAM PINKERTON
Harvard News Service

ROBERT PLUMB
New York Times

FRED POLAND
Montreal Star

ALBERT ROSENFELD
Life Magazine

MARION K. SANDERS
Harper's Magazine

HERBERT SHAW
Harvard News Service

EDWARD SHERBURNE
*American Association for the
Advancement of Science*

DELOS SMITH
United Press International

ARTHUR SNIDER
Chicago Daily News

MILDRED SPENCER
Buffalo Evening News

WILLIAM P. STEVEN
Houston Chronicle

WILLIAM STILES
Harvard News Service

VOLTA TORREY
M.I.T. News Service

JOHN TROAN
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W. HOMER TURNER
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EARL UBELL
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