

Twenty-third Annual Alumni Seminar

Saturday, May 7, 1960

Exceptional Evening Program

DINNER – HUNTINGTON-SHERATON HOTEL

“EDUCATION IS NOT EASY” – LEE A. DuBRIDGE

Dr. DuBridge will discuss some of the problems facing higher education in America in the light of rising enrollments and increasing selectivity. These problems lead to serious consideration of the selection process and to the establishment of an educational program in each institution to meet the needs and capabilities of the students it selects.

Special Exhibits

SYNCHROTRON LAB – COMPUTER CENTER

HEMOGLOBIN EXHIBIT – SELECTED DOCUMENTARY FILMS

Outstanding Lecture Program

A choice of four vitally interesting lectures at each of three morning periods will be repeated (with one exception) during three afternoon periods to insure broadest selection and continuity of interest for alumni and for guests.

Alumni outside of southern California who wish to attend the Seminar should write the Alumni Office for reservations.

SEMINAR LECTURES

EXPERIMENTS ON BRAIN FUNCTIONS

9:30 A.M. Only

Mitchell Glickstein, Research Fellow, Biology

The problem of how learning and memory functions are carried out in the brain has remained a mystery for centuries. Even the simpler question of where in the brain learning takes place has resisted a clear-cut solution. The split-brain technique pioneered at Caltech is providing some clues as to localization of the learning process. Eventually it may assist us towards an understanding of how the brain works.

HUNTING BIG EARTHQUAKES IN INDIA

9:30 A.M. and 2:15 P.M.

D. E. Hudson, Professor of Mechanical Engineering

The biggest earthquakes in history have occurred along the Himalayas. The Earthquake Engineering Research Laboratory of the Caltech Division of Engineering is cooperating with the University of Roorkee in India in the study of earthquakes in this region from the standpoint of earthquake-resistant structural design. The Caltech staff has encountered many interesting problems, technical and otherwise, in the course of living and working in India. Some of the problems related to the establishment of field stations, design and construction of instruments, and the training of research personnel in India will be discussed.

SOUTH POLE DEEP FREEZE

9:30 A.M. and 2:15 P.M.

Trevor Hatherton, Research Fellow, Geophysics

One of the two major breakthroughs of the International Geophysical Year was the permanent occupation of Antarctica. Scientists of twelve nations participated in the cooperative effort. The work accomplished by these men, their living conditions and special problems, and the future of the Antarctic continent will be discussed by Dr. Hatherton, who was in charge of the New Zealand group.

EXPLOSIVE AFRICA

9:30 A.M. and 2:15 P.M.

Horace N. Gilbert, Professor of Business Economics

Africa's exploding political nationalism must have an economic foundation in order to have any chance of success. Professor Gilbert spent ten weeks last summer studying the economics of some of the countries comprising Central and Southern Africa. Will there be race riots and intertribal wars, or real economic progress?

NATURE'S MOLDY FACTORY

10:45 A.M. and 3:15 P.M.

John H. Richards, Assistant Professor of Chemistry

The variety of substances produced in nature by simple organisms is astonishing. Many of these substances, which are of great benefit to man, are exceedingly complex organic molecules. A challeng-

ing area of chemical research today is to discover the mechanism by which these complex units are formed from simple building blocks. Dr. Richards will discuss some of the techniques used in solving these mysteries.

DESALTING SEA WATER

10:45 A.M. and 3:15 P.M.

Jack E. McKee, Professor of Sanitary Engineering

Considerable publicity has been given recently to the economic potentialities of desalting sea water. Sources of water pose a serious problem for regions with an arid climate. Desalting seawater may be our solution, but is it the best solution? There may be other ways in which potable water can be reclaimed. Professor McKee will review the current status of this problem.

OUR CHANGING CITIES

10:45 A.M. and 3:15 P.M.

Robert W. Oliver, Assistant Professor of Economics

How fast and in what ways are our cities changing and growing? What has been the impact of recent population growth, of the automobile, of changing shopping habits? What happens to the older parts of cities when they are not remodeled to keep pace with changing tastes and technologies. What can be done and is being done about blighted areas? Dr. Oliver will discuss these questions relating to urban redevelopment.

FERROMAGNETIC THIN FILMS

10:45 A.M. and 3:15 P.M.

Charles H. Wilts, Professor of Electrical Engineering

An exciting recent development in solid state physics is the use of thin films of materials as a means of probing further into the properties of matter. It is found that these thin films often exhibit properties not ordinarily found in bulk materials. A particularly interesting example of this is the thin film of a ferromagnetic metal. It provides a device which shows promise as a high speed switching element, logic component and memory cell and at the same time permits a very high density of functional elements, since each film may occupy a volume not greater than 10^{-8} cubic inch.

DNA — A CARRIER OF HEREDITY

11:45 A.M. and 4:15 P.M.

Matthew S. Meselson, Assistant Professor of Chemistry

The ordered advance from embryo to adult is the result of the coordinated interplay of many thousands of protein molecules. The master code, which tells an organism how many and what kinds of proteins to build, is contained in the substance of its genes, deoxyribonucleic acid—DNA. Passed down from generation to generation, specific giant molecules of DNA may maintain continuity of living

matter. Biologists today are seeking to understand this chemical code of life.

NUCLEAR FURNACES IN THE SKY

11:45 A.M. and 4:15 P.M.

William A. Fowler, Professor of Physics

Astronomical observations have indicated that matter is given off by stars, and that new stars are continually forming from interstellar material. The observed energy outputs of stars and supernovae imply that nuclear transformations are taking place. Experimentation in nuclear physics has led to the discovery of processes by which the lighter elements are converted into heavier elements in the stars. These findings are correlated with what we know of stellar evolution to provide a better understanding of the structure, history and age of our galaxy.

ADVENTURES IN MADNESS

11:45 A.M. and 4:15 P.M.

J. Kent Clark, Associate Professor of English

The autobiography of Goodwin Wharton (1653-1704) is one of the most bizarre documents in the English language. Wharton was an alchemist, spiritualist, diver, soldier, M.P., lord of admiralty, inventor, and part-time lover; he was also the most gullible man in England. He was taken in hand by a lady spiritualist, Mary Parish, the most accomplished liar and determined confidence woman in recorded history. Dr. Clark will discuss some of the high points in Wharton's life and some of the problems faced in editing the manuscript for its forthcoming publication by the Huntington Library.

A NEW LOOK AT THE MOON

11:45 A.M. and 4:15 P.M.

A. R. Hibbs, Acting Division Chief, Space Science, JPL

Now that we plan to send instruments to the moon for an on-site inspection, many of our old ideas about our small sister planet are being reviewed — and found wanting. Is the surface rugged or desert-smooth? Are the Maria lava-flows or planes of dust a kilometer deep? Is the surface unchanged since its formation five billion years ago, or has some process of erosion been steadily altering its appearance?

HOW OUR NERVES WORK

2:15 P.M. Only

A. Van Harreveld, Professor of Physiology

A great deal has become known in the last decade concerning the physical chemical mechanism of nerve excitation and its transmission from a nerve fiber to an end-organ such as a muscle fiber. These studies also extend to much more complicated phenomena in the central nervous system. Dr. Van Harreveld will review recent progress in this field.