AAAS Section Programs

PHYSICS (B)

30 December

Exobiology: The Search for Extraterrestrial Life and Its Biological and Sociological Implications

A program of the American Astronautical Society, arranged by Martin M. Freundlich (Airborne Instruments Laboratory). Bernard Wagner (Columbia University and Rockefeller University) will be chairman.

Morning

Carl Sagan (Harvard University and Smithsonian Astrophysical Laboratory), *The Solar System as an Abode of Life.*

Richard S. Young (National Aeronautics and Space Administration), *Life Detection Techniques.*

Gilbert Levin (Biospherics Research, Inc.), *Automated Microbial Metabolism Laboratory.*

Everett M. Hafner (University of Rochester), *Techniques of Interstellar Communication.*

Afternoon

Carl Sagan will be chairman.

Henry D. Isenberg (Long Island Jewish Hospital), *Origin of Microbiological Life on Earth and Its Implications for Extraterrestrial Forms.*

Wolf Vishniac (University of Rochester), *Biochemical Bases for Life in Extraterrestrial Environments.*

Bernard Wagner (Columbia University and Rockefeller University), *Sociological Aspects of Extraterrestrial Life.*

Panel Discussion.

The panel will discuss the physical environment of the planets of the solar system with reference to their habitability by indigenous organisms and give a critique of ground-based attempts to detect extraterrestrial life with particular attention to the planet Mars. The speakers will discuss the integrated experiments that must be performed in order to determine whether life exists on any of the planets. Life detection packages that can serve as automated laboratories to perform metabolic experiments will be described. The problems of preventing contamination of extraterrestrial bodies and their impact on space programs will be discussed.

The electromagnetic processes that are of importance in the search for intelligent extraterrestrial life will be reviewed. The possibility of exploiting the 1420 Mhz line of atomic hydrogen and the four lines of OH at approximately 1700 Mhz for interstellar communication will be scrutinized. The present status of techniques and observations in this field will be summarized and possible future refinements will be reviewed. Methods of distinguishing information from intelligent beings from signals of natural origin will be discussed. The panel will speculate on the forms that life may have taken outside of our planet. Our present concepts on unicellar development will be applied to this problem. Assuming that extraterrestrial life does indeed exist, a variety of philosophical, sociological, and biological implications arise. To what extent is our society prepared for these problems?

The Role of the Tropics in the General Circulation of the Atmosphere

29 December

A program of the American Meteorological Society, arranged by Henry M. E. van de Boogaard and Edward D. Zipser (National Center for Atmospheric Research, Boulder, Colorado).

Louis J. Battan (University of Arizona; President, American Meteorological Society) will be chairman and present introductory remarks.

Henry M. E. van de Boogaard and Edward D. Zipser, *The Line Islands Experiment: An Interagency Approach to Intensive Meteorological Research.*

Robert H. Simpson and Joanne Simpson (Environmental Science Services Administration), *How Cumulus Cloud and Tropical Storms Influence the Large-Scale Air Currents and Structure of the Tropical Atmosphere.*

Tetsuja Fujita and Dorothy L. Bradbury (University of Chicago), *A Use of the Applications Technology Satellite (ATS) Motion Pictures for Research in Tropical Meteorology.*

Postwar developments in meteorology have depended in large part on the electronic computer. Computer studies have led to better physical understanding of temperate-latitude atmospheric circulations and to dynamic modeling which has made numerical weather prediction possible for these latitudes.

Until now meteorological research in the tropics has not benefited a great deal from these developments, largely because of the lack of sufficient observations to diagnose the far more complex structure of the tropical atmosphere.

The tropics constitute a great heat engine which is partly responsible for driving the global atmosphere. Much of the solar heat received by the tropical ocean and land surfaces is released to the lower layers of the atmosphere by contact, evaporation and radiation. This heat is then further transported to the higher layers of the tropical atmosphere by means of cumulus cloud convection, and also by radiation. In turn, this accumulated energy is gradually transported poleward and transformed into kinetic energy, experienced in the form of wind or air currents.

Highly organized and intense tropical cumulus cloud development sometimes leads to development of tropical storms and hurricanes. These in essence are safety valves which provide the tropical atmosphere with another method of releasing its accumulated energy.

The locations of these regions of organized cumulus convection are essential data for tropical weather analysis. The recent synchronous ATS-1 (Applications Technology Satellite) satellite with its cloud camera has shown the way for ultimate instantaneous global cloud observations.

New technology such as the ATS-1

has encouraged scientists to have another look at the tropics. Future research programs, like the recently completed Line Islands Experiment, will provide a much more complete understanding of the behavior of the tropical atmosphere.

ZOOLOGICAL SCIENCES (F)

28 December

Animal Communication

A program of the American Society of Zoologists, arranged and introduced by Neal A. Weber (Swarthmore College), *The Rapid Expansion of Research in Animal Communication.*

Morning

Robert Capranica (Bell Telephone Laboratories), *Behavioral and Physiological Correlates of Vocal Communication in Frogs.*

William F. Martin (University of Texas), *Evolution of Anuran Communication Systems: Sound Production.*

W. John Smith (University of Pennsylvania), *Comparative Studies in Vertebrate Communication.*

R. Allen and Beatrice T. Gardner (University of Nevada), *Training of Primates to Communicate with Gesture.*

Afternoon

Vincent G. Dethier (Princeton University) will be chairman and present introductory remarks.

Thomas Eisner (Cornell University), *Cross-specific Chemical Communication.*

Edward O. Wilson (Harvard University), *Recent Advances in Chemical Communication.*

Animal communication may take auditory, visual, tactile, biochemical or some combination of forms, both between members of a species or between unrelated species. The organism receives information from the external environment, a signal is made and the animal perceives it, responding appropriately.

The advent of refined instrumentation and more critical approaches have markedly increased our knowledge of animal communication. The biochemistry of the signals, their origins and methods of transmittal, the receptors, the neural mechanisms are all being investigated intensively in both vertebrates and invertebrates.

SOCIAL AND ECONOMIC SCIENCES (K)

27 December

Science and Technology as Instruments of Policy

A joint program with the American Political Association, arranged and to be chaired by Sanford A. Lakoff (State University of New York, Stony Brook).

Speaker: Fred S. Hoffman, (Bureau of the Budget, Washington, D.C.), *Systems Analysis and Social Policy.*

Commentators: Amitai Etzioni (Columbia University), Edward Friedland (State University of New York, Stony Brook), Bruce L. R. Smith (Columbia University), and Albert Wohlstetter (University of Chicago).

Systems analysis is a tool to assist in making large-scale decisions within a complex social setting. It has recently been embedded in a decision process called the Planning, Programming, and Budgeting System (PPBS) for the nonmilitary agencies of the federal government and for some state and local governments. The principal antecedents of both systems analysis and PPBS are in the design and operation of our military forces. The need for systems analysis in military applications arose from the displacement of directly relevant experience by the revolutionary post-World War II developments in military technology, by the accompanying increases in the importance, complexity, and cost of military equipment, and especially by the need to extend the planning horizon farther into the future.

Systems analysis was incorporated into an integrated planning, programming, and budgeting process for the Defense Department under Secretary McNamara in 1961. That process laid heavy emphasis on the explicit statement of alternatives and systematic comparisons among the costs and effectiveness of the alternatives as a basis for making choices among them. This basis has not replaced judgment in the process, but has strengthened and informed it. It has not replaced debate and bargaining in the process, but has focused it and enabled it to converge on useful, rather than arbitrary, compromises.

There are important differences, as well as some similarities, in the reasons for applying systems analysis and the PPBS to the nonmilitary agencies. Our society is undergoing important changes in both its goals and technology. Their effect has been largely to increase the importance and scale of collective decisions. This increase has created vitally important problems for government. First, our society still prefers individual choice wherever it leads to viable results. Second, unlike the competitive sectors of the private enterprise economy, government activities are not automatically subject to a selective process or discipline ensuring their efficiency. Third, public activities powerfully affect, for good or evil, the private sectors of our economy. It is the aim of the Planning, Programming, and Budget System to devise yardsticks in order to aid judgment about the goals and efficiency of government programs.

28 December

Science, Technology, and Political Decision Making

A program arranged and chaired by Charles V. Kidd (Federal Council for Science and Technology, Washington, D.C.).

Herbert Roback (House of Representatives, Washington, D.C.), *The Role of Congress.*

Emmanual Mesthene (Harvard University), *Technology and the Polity.*

Discussants: Richard Nelson (Rand Corporation) and Christopher Wright (Columbia University).

No problem of science policy has generated more theoretical issues than that of how to determine rationally how much ought to be invested in science and in technology, and how this investment ought to be divided among fields of science and among efforts to solve important problems. An equally difficult set of issues arises in the practical area: If one knew what to do, what structures and processes are best designed to secure effective action? Recent reductions and increases in the budgets of federal agencies accentuate the practical significance of the problems of choice, which involve a complex of technical, economic, social, and political issues.

The symposium will provide an opportunity to discuss the competition for resources among activities designed to reach economic, social, and cultural goals, and the processes through which the competition is expressed.

29 December

Research in Birth Control and Changing Sex Behavior

A program arranged and chaired by Ailon Shiloh (University of Pittsburgh).

Paul H. Gebhard (Indiana University), *Changing Sex Behavior among College Youth.*

Ira L. Reiss (University of Iowa), *The Social Context of Premarital Sexual Permissiveness.*

Ailon Shiloh, *Behavioral Characteristics among Women Utilizing Selected Birth Control Techniques.*

Frederick J. Ziegler (Cleveland Clinic Foundation), *Sexual Behavior and Non-Coital Contraception.*

Discussants: Mary Calderone (Sex Information and Education Council of the United States) and Charles F. Westoff (Princeton University).

The purpose of this symposium is to present original research data concerning relationships between birth control and changing sex behavior. The symposium will highlight different theoretical and methodological approaches to the problem. Two senior authorities in this area of research will evaluate and discuss the papers and their implications. Questions from the audience and comments have been scheduled following each speaker and the discussants.

STATISTICS (U)

27 December

Estimating the Numbers in Insect Populations

A program of the Biometeric Society, arranged and chaired by E. C. Pielou (Canada Department of Agriculture, Ottawa).

Morning

J. F. Wear (U.S.D.A. Forest Service), *Aerial Techniques for Estimating Impact of Forest Pests on Forest Resources of the United States.*

C. A. Miller (Canada Department of Forestry & Rural Development), *Estimating the Sizes of Sparse Populations of Spruce Budworm.*

D. O. Greenbank (Canada Department of Forestry & Rural Development), *Population Sampling for a Recently Introduced Forest Insect.*

J. U. McGuire, Jr. (U.S. Department of Agriculture), *Progress in Estimating Insect Populations.*

Afternoon

L. P. Lefkovitch (Canada Department of Agriculture), *Canonical Correlation and Population Growth.*

F. B. Knight (University of Michigan), *Field Sampling for Forest Insect Population Evaluation.*

D. M. Lee (Canada Department of Forestry & Rural Development), *Monte Carlo Experiments on Sampling from Non-Normal Populations.*

R. C. Chapman and G. M. Furnival (Yale School of Forestry), *Sampling Insect Populations and Estimating Life Contingencies.*

As the world's population grows the struggle between men and pest insects for the available food and forest resources is becoming more intense, and more expensive. The success, or lack of it, of attempts at pest control, cannot be judged unless one can estimate the number of pests in a given area. Only when these estimates can be made is it possible to judge how population sizes fluctuate, both naturally and as a result of human intervention. Many species of insect are involved; they vary widely in density; in the sort of environment they are found in; in motility; in their behavior at the different stages of their life histories; in the degree to which they are controlled by natural agencies; and in the damage they cause. Any particular population therefore presents its own peculiar problems. Taking the particular circumstances into account, the field worker has to devise a sampling scheme that is statistically sound, that gives the required precision, and that he can afford on his own budget. There is thus great need for a thorough union of practical and theoretical knowledge.

AAAS-Westinghouse Science Writing Awards

The winners of the 1967 AAAS-Westinghouse science writing awards in three categories were announced today. Each award carries a $1000 cash prize.

Irving S. Bengelsdorf, science editor, of the Los Angeles *Times*, is the winner of the award for writers on newspapers with a daily circulation of more than 100,000. His entry consisted of three articles: "The Universe Is Unbelievable," 22 December 1966; "Physicist's Sun-Bulge Finding Challenges Einstein Relativity Theory," 20 February 1967; and "Red China's Incredible Technological Revolution," 23 July 1967.

Jean Gillette, of the San Angelo, Texas, *Standard-Times*, is the winner of the award for writers on newspapers with a daily circulation of under 100,000 for her articles: "In Ancient West Texas—Fireball Exploded on Prairie," 1 January 1967; "Thunderstorms: Killers and Lifesavers," 9 July 1967; and "Presido Study Probes Total Environment," 23 July 1967.

Isaac Asimov, free-lance science writer, won the $1000 award for magazine writing with his article "Over the Edge of the Universe" in the March 1967 issue of *Harper's Magazine*. The article discusses the discovery of quasars and their significance with respect to current cosmological theories.

An article, "A Close Look at Wildlife in America," earned an honorable mention for Bil Gilbert, a contributing writer for *The Saturday Evening Post*. The article appeared 9 September 1967.