Health and Biology

Developmental Biology

"Mechanisms of Dormancy and Developmental Arrest," arranged by Mary E. Clutter of Yale University, will be presented on 27 December. Dormancy is not simply a cessation of development, but a complex process involving structural, physiological, and molecular changes in organisms, causing them to enter the dormant state, to maintain that state, and to exit from it into another period of growth activity.

In the first session Craig Heller of Stanford University will discuss dormancy in mammals, expressed as a state of torpor, whereby the dormant animal decreases its metabolic energy demands and can survive periods of food scarcity. In insects diapause, a state of developmental arrest, is a normal stage, seemingly cued by photoperiod. The receptor site is the brain, and the phenomenon is controlled hormonally. Karen Sprague of Yale University will present a paper on this topic. In higher plants a normal event in development is the formation of a dormant seed as the final stage of embryogeny. Virginia Walbot of the University of Georgia will treat control mechanisms in plant embryogeny. Larry Noonén of the University of Michigan will describe dormancy in perennial plants.

The second session will deal with regulation of dormancy at the molecular level and attempt to develop models for dormancy and associated events that can be applied to all organisms exhibiting such behavior. Through the use of bacterial mutants it is possible to examine the thermally controlled program of developmental events leading to dormancy and those regulating the breaking of dormancy—the subject of a paper by William Steinberg of the University of Virginia Medical School. James C. Vary of the University of Illinois Medical Center will discuss the subsequent release from dormancy through the initiation of germination. In buds and seeds of higher plants dormancy can be induced or broken experimentally through the application of hormones—the subject of the concluding presentation by G. M. Simpson of the University of Saskatchewan, who will also offer summary comments on the symposium.

Agricultural Genetics

Also on 27 December, a day-long program sequence will treat the application of genetics to agriculture. The morning session, "Genetic-Physiological Approaches to Animal Improvement," arranged by Ralph Hodgson of the U.S. Department of Agriculture, will appraise opportunities for improving animal food production such as hybrid vigor through crossbreeding and the introduction and use of exotic germ plasm. Papers will be presented by Gordon E. Dickerson, University of Nebraska; D. N. Day, University of Missouri; H. D. Hafs, Michigan State University; and Edward G. Buss, Pennsylvania State University.

In the afternoon, "Genetic Vulnerability of Crops" will offer a case study of the risks of specialization, which narrows the adaptive range of food plants. An epidemic of southern corn leaf blight caused a loss of about 15 percent of the corn crop of the nation in 1970, largely because corn, like most American crops, is highly vulnerable to epidemics because its genetic base is narrow. The market favors uniformity and farmers need uniformity for ease of manipulation. Uniform varieties are even specified by law in some states and Canada. Arranger: James G. Horsfall, Connecticut Agricultural Experiment Station; papers by Warrent H. Gabelman, University of Wisconsin; David H. Timothy, North Carolina State University; and George F. Sprague, U.S. Agricultural Research Service.

Human Genetics

On the day following (28 December), the applied genetics sequence continues with "Genetics and Human Disease," arranged by Victor A. McKusick of Johns Hopkins University. H. N. Kirkman, University of North Carolina, will describe the remarkable progress of biochemical genetics in the two decades since the first demonstration of the specific enzyme defect in an inborn error in metabolism by the Coris in 1952.

The determination of protein structure makes possible a wide range of inferences, and topics previously as seemingly diverse as protein polymorphisms, hemoglobinopathies, inborn errors of metabolism, and blood groups have been found to fall into the same theoretical framework.

Margery W. Shaw, University of Texas, will survey powerful new techniques in cytogenetics. Barbara R. Migeon, Johns Hopkins University, will describe the application of cell hybridization to the chromosomal localization of specific human genes. Wilma B. Bias of Johns Hopkins University will treat immunogenetics, including the genetics of specific antigenic differences (blood groups, histocompatibility types) and of the immune response. Behavioral genetics, to be described by Barton Childs, Johns Hopkins University, concerns itself with some of the most important of the traits of man including intelligence, the genetics of mental disorders, such as schizophrenia, and specific reading disability (dyslexia). Prenatal diagnosis by amniocentesis has added significantly to the armamentarium of the genetic counselor. This method and its use in genetic counseling will be described by Cecil B. Jacobson, George Washington University.

Neil A. Holtzman, Johns Hopkins University, will review methods for treating genetic disease such as limiting substrate and providing substances missing because of an enzymatic defect in their synthesis. Other approaches to be described include enzyme induction and enzyme replacement, as well as the feasibility of directing specific macromolecules to specific organs. Robert F. Murray, Howard University, will describe sickle-cell anemia, the most frequent Mendelian disorder of American Negroes. Edmond A. Murphy, Johns Hopkins University, will review such aspects of genetic counseling as estimation of risks and effective transmission of that information to the consultant. H. Vasken Aposhian, University of Maryland, will discuss future prospects for therapy, employing the experimental approach to the introduction or transfer of genes in mammalian cells.

Biochemistry and Physiology

On 28 and 29 December, the AAAS Section on Dentistry will conduct an important symposium, "Models for Transport in Biological Systems," arranged by Walter E. Brown, director

of the American Dental Association Research Unit at the U.S. National Bureau of Standards. The purposes of this symposium are to describe the more important models presently in use, to assess their successes and shortcomings, and to work toward improvements. The following speakers will participate: Robert A. Spangler, State University of New York at Buffalo, on "Transport through Thick Films"; Robert I. Macey, University of California, Berkeley, on "Transport through Biomolecular Lipid Membranes"; Richard P. Wendt, Loyola University, on "Effects of Various Physical and Chemical Factors"; Stanley I. Rapoport, National Institute of Mental Health, on "Relationship between Metabolism and Active Transport in Living Cells"; Richard M. Hays, Albert Einstein College of Medicine, on "Physiological Considerations in Models for Cellular Transport"; and Mones Berman, National Cancer Institute, "Iodine Kinetics: Compartmental Modeling."

On the second day (29 December), John H. Marshall, Argonne National Laboratory, will offer "A New Model for Alkaline Earth Metabolism"; William I. Higuchi, University of Michigan, "Models Relating to the Uptake and Dissolution of Drugs"; and Walter E. Brown, U.S. National Bureau of Standards, "Role of Transport in Dental Caries." Harold Lecar, National Institute of Neurological Diseases and Stroke, will present "Transport in Excitable Tissues"; John A. Jacquez, University of Michigan, "Models of Transport of Non-Electrolytes"; and Peter F. Curran, Yale University, "Models of Epithelial Transport Systems."

Pharmacology

On 28 December "Parameters Influencing Drug Interactions" will be discussed in a symposium arranged by Linwood Tice, dean of the Philadelphia College of Pharmacy and Science. Even some foods can create problems with certain drugs. The participants in this symposium will try to present an overview and appraisal of this subject as it involves both clinician and pharmacist. "An Overview of Drug Interaction" will be offered by Daniel A. Hussar, Philadelphia College of Pharmacy and Science. Then will follow: "Evaluating Drug Interaction Literature," James A. Visconti, Ohio State University Hospitals, and "Interactions Involving Non-Prescription Drugs," Richard P. Penna, executive secretary, Academy of General Practice, American Pharmaceutical Association. In the afternoon, the program will include "Interaction of Drugs with Foods," Peter P. Lamy, University of Maryland; "Selected Studies of Drug Interaction," Philip P. Gerbino, Philadelphia College of Pharmacy and Science; and "Utilizing and Communicating Drug Interaction Information," J. Edward Bell, Mercy Hospital, Pittsburgh, Pennsylvania.

Psychopharmacology

As the second in a sequence of programs on pharmacology, on 29 December, a symposium will be offered in an effort to combine historical, institutional, psychological, and biochemical approaches to an understanding of mental health treatment modalities: "Chlorpromazine: The Use of Drugs in Mental Illness, 1952–1972." The development of various classes of psychotropic drugs over the past two decades has had a profound impact on the field of mental health, the operation of mental hospitals, and the treatment of patients. Professional and lay attitudes toward the mentally ill have also been affected by the drugs produced in the modern era of psychopharmacology. The first major antipsychotic drug was chlorpromazine (CPZ), synthesized in France in 1950 and used by French psychiatrists in 1952. The morning session will offer a fresh interpretation of the synthesis and introduction of this drug by Judith Swazey, consultant to the Committee on Brain Sciences, National Academy of Sciences, and Leonard Cook and Charles Bolling, both of Smith Kline and French Laboratories.

The symposium's afternoon session will move from the CPZ instance to look more broadly at the use of psychopharmacologic agents in mental illness. In his present position as superintendent of Boston State Hospital, and as the former director of the Psychopharmacology Service Branch of the National Institute of Mental Health, Jonathan O. Cole is a leading authority on the use of psychotropic drugs in the hospital setting. His paper will explore the role of these drugs in patient management and treatment over the past two decades and assess their current status as therapeutic agents. Gerald L. Klerman, Harvard University Medical School, will then appraise the effects of psychotropic drug therapy. He will address issues such as the impact of CPZ-like drugs on ideology and professional attitudes in psychiatry and other mental health professions and upon public attitudes toward mental illness, and consider what he sees as a growing social problem created by psychotropic drug treatment: the often marginal existence of individuals able to return from the hospital to their communities. The symposium will close with an attempt to gauge the future. John A. Davis, Vanderbilt University Medical School, will survey the horizons of psychopharmacology and the implications of its prospective development for the treatment of mental disease states.

Interdisciplinary Synthesis

On 30 December a symposium will seek conceptual integration of several aspects of medical science in the community setting. "Interdisciplinary Approaches to Community Health with Emphasis on Social Science and Mental Health" will be arranged by Mirta T. Mulhare and Jack A. Wolford, University of Pittsburgh Medical School. The papers will describe various interdisciplinary programs and approaches to clinical services, research, and the training of postdoctoral, doctoral, and undergraduate students in various disciplines working in community health. A collaborative approach to research and some of the results are also to be presented. The morning session will explore antisocial behavior and mental health in the urban environment. Speakers and their topics will be Michael Crawford, University of Kansas, "Selection or Behavioral Adaptation, the Urban Dilemma"; Jay Nolan, Tulane University, "Problems in Interdisciplinary Learning"; Herbert E. Thomas, University of Pittsburgh, "Regressive Behavior in a Maximum-Security Prison"; and Tobias Brocher, Justus Liebig University (Giessen, West Germany), "Concepts of Interdisciplinary Contributions to New Professional Roles in Community Mental Health."

The afternoon session will develop an interdisciplinary perspective on the problem family, with the following papers: David Dyon and James Heaney, "The Sociocultural Context"; Shoukry Matta, "The Psychiatric Context"; Murray Charleson, "Large Groups, Small Groups, and the Family: An Interdisciplinary Model for the Study of Differences in Relationship to the Task of Teaching Family Therapy"; Mirta T. Mulhare, "The Integration of Behavioral Science Concepts into Service and Training in a Community Health Program"; and the concluding paper, "Social Psychiatry in Community Health: An Interdisciplinary Model," by coarranger Jack A. Wolford. All speakers are affiliated with the University of Pittsburgh Medical School and their papers exemplify a problem-oriented interdisciplinary approach in practice.