keynote speech, entitled "Applied Microbiology in the Future of Mankind," that even in his most brilliant periods man has been relatively blind and therefore ignorant. He has been unable or unwilling to see and to meet the challenge of the times, and the consequences of his blindness have been disaster.

The conference was arranged by the Section for Economic and Applied Microbiology of the International Association of Microbiological Societies and the Royal Swedish Academy of Engineering. It was cosponsored by the World Academy of Art and Science and supported by the Swedish Government, UNESCO, CIOMS, IUBS, and private contributions. The papers given at the plenary sessions and the reports of the panel session will be published during the autumn of 1963. Officers of the conference were C. G. Hedén, chairman and M. Tveit, general secretary.

JORGEN M. BIRKELAND
Department of Microbiology,
Ohio State University, Columbus 10

Cardiovascular Disease

"Psychophysiologic Aspects of Cardiovascular Disease" was the subject of an interdisciplinary conference at Timberline Lodge, Oregon, 26–28 June. The conference stemmed from discussions between E. C. Andrus, chairman of the National Advisory Heart Council of the National Heart Institute, and various other officials of the National Heart Institute who felt that a systematic appraisal of this area, including prospects for future investigations, was desirable for two reasons. The first reason follows from two recent presidential addresses to the American Psychosomatic Society (by Erich Wittkower in 1960 and by Morton Reiser in 1961); the former expressed disappointment in the results of the past 20 years of psychosomatic research in this field, and the latter suggested that at the level of psychophysiological correlations within a given individual we may have to undertake such novel and difficult approaches as experimental manipulations of the individual's level of conscious awareness. The second reason is that the magnitude, complexity, duration, and cost of current and forthcoming investigations in the field pose unusual scientific and social problems that can be best solved through person-to-person investigations of the relevant issues.

The general questions posed at the symposium included: (i) What do we know about the relation of symbolic experiences to cardiovascular mechanisms and to cardiovascular disease? (ii) Who is working in this area and what kind of work is being done? (iii) What are the currents and directions in this area? (iv) What are the needs—methodological, conceptual, financial? (v) Where do we go from here?

The conference was arranged so that morning sessions dealt with research needs and goals suggested by clinical observations, while afternoon sessions dealt with methodological implementation of these needs. A final session attempted to digest and anabolize the transactions of the previous sessions. On the whole the symposium provided maximum opportunity for discussion and presentation of new and provocative data. The formal presentations included: "Psychological aspects of heart disease," Louis Katz; "A critique of aspects of methodological approaches to the role of the central nervous system in cardiovascular disease," George Burch; "Psychophysiologic aspects of blood pressure regulation: the clinician's view," Caroline Thomas; and "Psychophysiologic aspects of blood pressure regulation: methodological issues," Alvin Shapiro. A summary, "Synthesis and perspectives," was provided by Adrian M. Ostfeld and Stewart Wolf.

The disciplines represented included: neurophysiology (Birger Lofving, Sweden), statistics (Mindel Sheps), biochemistry (Theodore Sourkes), preventive medicine (Lester Breslow), mathematics (Murray Eden), Pavlovian psychology (W. H. Gantt), operant conditioning psychology (Orville Smith), pediatrics (Earle Lipton), psychoanalysis (Leon Moses), cardiovascular physiology (J. W. McCubbin), clinical hemodynamics (Jan Brod), pathology (Ralph Strebel), clinical cardiology (Bernard Lown), and psychiatry (David Hamburg). Among the 51 participants were a representative of the World Health Organization (Z. Fejfar) and of the National Heart Institute (Malvina Schweizer).

There was general agreement that verbal and other symbolic stimuli could affect cardiovascular functions as much as physical and chemical stimuli do. But there was general dissatisfaction with our present knowledge of the detailed steps between the symbolic stimuli and the final cardiovascular responses and with our ability to relate clearly to one another the autonomic, higher nervous system, and humoral components of these intermediate steps. Despite the plausibility of the proposition that discrete cardiovascular responses to intermittent symbolic stimuli become (with repetition over time) sustained cardiovascular disease, the solid evidence for this proposition remains feeble.

Investigators in different fields discovered that they could make important contributions to each other's work. Thus, a subject as limited as a segment of human superficial vein (Burch) could, if an investigator of personality traits wished, help make more explicit and precise the terms used by the student of personality traits. He had only to relate his language of personality description to the precise descriptions that can be made of the behavior of the segment of vein in the same person at the same time.

Personality theory need not always come from personality theorists. Lacey's careful studies of the autonomic system led him to a view of the relationship between baroreceptor activity and certain aspects of personality functioning (preoccupation with external environment or with internal events) which constitutes an alternative view of the hypertensive personality to that shared by most students of that subject. His view is a more general one, though it arose from a more circumscribed field of study.

New and ingenious methods are always appearing in problem areas thought inaccessible. Reproducible experimental study of the communication of subtle affective states in a monkey (and associated effects upon the cardiovascular functions of the receiver monkey) are achieved by conditioning and closed circuit television techniques (Miller).

Even though the explanation of the intermediate steps between intermittent symbolic stimuli and sustained cardiovascular disease may be far off (in the sense of clarifying the intermediate steps in the metabolism of glucose), it may be feasible by epidemiological studies on a large, expensive scale over a 6- to 10-year period. Such findings would establish that the sequence does, in fact, exist and that some presently suspected etiological factors are relevant to the disease outcome while others are not.

The conference may be judged successful in making known the work which is being carried out in this field and defining the state of our knowl-

edge on various pertinent issues. It was suggested that another meeting be held, in about 2 years, but that it should be focused upon a more narrowly defined topic and arranged so as to constitute a work conference dealing with the particular topic.

The Steering Committee is in the process of deciding the manner in which the proceedings will be published.

GEORGE SASLOW
Department of Psychiatry,
University of Oregon
Medical School, Portland 1

Fungi and Yeasts: Chemistry and Biochemistry

Fungi and yeasts, whose metabolic activities have been of perennial interest, in recent years have been the source of many substances—for example, antibiotics, pigments, and polyphenolic compounds. The chemistry and biosynthesis of these substances are, in turn, of theoretical and practical importance and were the subject of discussion at an international meeting at University College, Dublin, 18–20 July. About 200 chemists and biologists attended.

In the sesssions on chemistry, V. Prelog (Zürich) presented the structure of the macrolide antibiotic rifomycin-S. The reactions of vitamin B_{12} and its "coenzyme" form, particularly the reactions with thiols, were described by A. W. Johnson (Nottingham). The high reactivity of the thiol cobalamines (>Co-S-R) makes them attractive possibilities as intermediates in biological O/R and alkyl transfer reactions.

During a discussion of the structure of the sclerotiorin group of antibiotics, W. B. Whalley (London) reported that CH_3-labeled malonate is a specific precursor of the terminal methyl of their common side chain. In contrast, the additional acetoacetyl side chain present in rotiorin is formed from two acetates rather than from one acetate and one malonate, as might have been anticipated. This side chain can also arise by oxidation of *n*-butyrate without equilibration with 2-carbon units.

General methods of causing organisms to alter their biosynthetic pathways were noted by A. J. Birch (Manchester) who reported the production of altered novobiocins after the addition of analogs of the noviose moiety, even though the free sugar was not utilized for antibiotic formation. The biological aspects of antibiotic biosynthesis were considered by D. J. D. Hockenhull (Glaxo Laboratories), who emphasized the importance of initial growth conditions and of the "maturation" or organization phase for the formation of highly productive cells. The suboptimal cell types usually obtained by continuous culture conditions constitute a serious limitation to the usefulness of this technique.

The metabolic patterns of two organisms growing under conditions characterized by a long lag phase were analyzed. *Caldariomyces fumago,* in an unusual sequence, initially oxidizes glucose to gluconic acid and then to 2-ketogluconic acid (D. Gottlieb, University of Illinois). Adaptation to phosphorylation of 2-ketogluconic acid finally occurs, and the resulting 6-phosphate ester is then reduced to 6-phosphogluconic acid, which is utilized through both the pentose and Entner-Doudoroff pathways. The long and unpredictable lag of *Torula utilis* on acetate (oxidation occurs without net synthesis of protoplasm) is apparently terminated by the formation of isocitrate lyase. G. Ehrensvärd (University of Lund) pointed out that the requirements for induction cannot be defined at present, but that isocitrate accumulation is not the critical factor.

Yeast has no defined Golgi apparatus, such as is present in higher plants and is considered to form the polysaccharide that is subsequently transported to growing points of the cell wall. However, D. H. Northcote (Cambridge) demonstrated that membranous structures are adjacent to the nucleus and may play an analogous role in secreting wall material. It was reported that these structures are continuous with the cell membrane and have a high content of mannan, thus supporting Northcote's concept of their function.

Appropriately for a meeting in Ireland, E. Kuster (Dublin) outlined the composition and microbial flora of peat. Extracts of peat, though poor energy sources, stimulate the growth of a variety of organisms. The lectures were followed by a group visit to the peat bogs to observe the mechanized production of milled peat and peat briquettes.

The symposium was sponsored by the Irish National Committee for Chemistry under the auspices of the International Union of Pure and Applied Chemistry and was supported by Arthur Guinness Son and Company (Dublin) Ltd. The lectures will be published in *Pure and Applied Chemistry.*

J. OLIVER LAMPEN*
Institute of Microbiology,
Rutgers University,
New Brunswick, New Jersey

*Temporary address (until 1 Aug. 1964): National Institute for Medical Research, London, N.W.7.

Forthcoming Events

November

11–16. **Engineering Materials and Design,** conf. and exhibition, London, England. (Industrial and Trade Fairs, Ltd., Commonwealth House, 1–19 New Oxford St., London, W.C.1)

12–15. **Magnetism** and Magnetic Materials, 9th conf., Atlantic City, N.J. (W. D. Doyle, Franklin Inst. Laboratories, 221 N. 21 St., Philadelphia 3, Pa.)

13–14. American College of **Preventive Medicine**, Kansas City, Mo. (R. E. Coker, Jr., Univ. of North Carolina, Chapel Hill)

13–15. Eastern **Analytical** symp., 5th, New York, N.Y. (R. F. O'Connell, Sperry Rand Research Center, Sudbury, Mass.)

13–16. American **Medical Women's Assoc.,** San Antonio, Tex. (AMWA, 1790 Broadway, New York 19)

14–15. **Chemical Engineering**, 20th symp., College Park, Md. (ACS, 1155 16th St., NW, Washington, D.C.)

14–21. **Measurement, Control, Regulation and Automation**, 2nd intern. congr., Paris, France. (MESUCORA, 40, rue de Colisée, Paris 8)

15–16. **Cineradiology**, 4th symp., Rochester, N.Y. (S. M. Rogoff, Div. of Diagnostic Radiology, Univ. of Rochester Medical Center, Rochester 20)

15–16. International Soc. of **Dental Surgeons**, Las Vegas, Nev. (E. Altshuler, 6043 Hollywood Blvd., Los Angeles, Calif.)

15–16. American Inst. of **Industrial Engineers**, regional conf., Davenport, Iowa. (C. G. Worthington, 100 Park Ave., New York 17)

15–19. **Diabetes**, 1st world congr., Chicago, Ill. (with the 2nd Pan American Diabetic Congr.). (Diabetic Inst. of America, 55 E. Washington St., Chicago 2, Ill.)

17–22. American Soc. of **Mechanical Engineers**, winter annual, Philadelphia, Pa. (ASME, 29 W. 39 St., New York 18)

17–22. **Radiological** Soc. of North America, annual, Chicago, Ill. (M. D. Frazer, 1744 S. 58 St., Lincoln, Neb.)

18–19. Unconventional **Inertial Sensors**, symp., Farmingdale, N.Y. (M. J. Minneman, Republic Aviation Corp., Farmingdale)

18–20. **Engineering in Medicine and Biology**, 16th annual conf. and exhibit, Baltimore, Md. (H. Gilmer, 933 Ridge Ave., Pittsburgh 12, Pa.)

18–21. **Atomic Industrial Forum** and American Nuclear Soc., winter meeting, New York, N.Y. (O. J. Du Temple, ANS, 86 E. Randolph St., Chicago 1, Ill.)

(*Continued on page 606*)