

Meetings

Respiration and Fermentation

The Society of General Physiologists held its 16th annual meeting at the Marine Biological Laboratory, Woods Hole, Massachusetts, from 5 to 8 September. The scientific program included six sessions of contributed papers and a symposium, organized by Barbara Wright, entitled "Control Mechanisms in Respiration and Fermentation." In conformity with the aims and objectives of the society, consideration was given, in selecting participants, both to the broad scope of the subject and to the various ways in which metabolic control may be effected in plants, animals, and microorganisms.

The papers presented in this symposium attempted to clarify various mechanisms that control and interrelate aerobic and anaerobic metabolism. H. O. Halvorsen (University of Wisconsin) described the role of dipicolinic acid as an electron acceptor during the burst in respiratory activity which accompanies the germination of a bacterial spore. Another microbial system—respiratory adaptation in yeast—was discussed by A. P. Nygaard (University of Oslo), and by T. P. Singer and C. Gregolin (Henry Ford Hospital, Detroit). These investigators are interested in the substrate specificity, activation, stability, and possible precursor relationships between the D-lactic acid dehydrogenase of anaerobically grown yeast and the cytochrome *c*-coupled L-lactic acid dehydrogenase of aerobic yeast. The role of oxygen in the biosynthesis of unsaturated fatty acids, tyrosine, and nicotinic acid was examined in a paper by H. Goldfine and K. Bloch (Harvard). They suggest that during evolution there occurred a superimposition or substitution of oxygen-dependent biosynthetic mechanisms for the anaerobic systems of more primitive species, as well as a development of new oxygen-dependent biosyntheses for which there are no anaerobic equivalents (sterols, polyunsaturated fatty acids, and so on).

D. P. Hackett (University of California, Berkeley) and G. G. Laties (University of California, Los Angeles) dealt with respiratory mechanisms and their control in plants. Various types of cytochromes, one of which is new, were found to be present in tissue homogenates; the hypothesis that there is a branch-point in the respiratory chain in the region of cytochrome *b*, as well as the possible significance of a nonphosphorylating pathway to O_2 as a mechanism for "facultative uncoupling," were considered. Laties gave evidence in support of the existence of a feedback system in which a volatile respiratory product determines the extent to which plant development can proceed. Although acetaldehyde fulfills the requirements for the proposed regulator, it is not yet known if this is in fact the endogenous agent.

S. M. Krane and R. K. Crane (Harvard) discussed increases in the reduced triphosphopyridine nucleotide level of marine eggs subsequent to fertilization and cleavage, a period which is also characterized by a burst of respiratory and synthetic activity. Another type of transition state that occurs during development in insects was described by G. R. Wyatt (Yale). The dormant metabolism of diapause is dramatically broken by the release of a hormone, ecdysone, which stimulates respiration and active tissue growth. The possibilities that the low respiration of diapause may be due to limiting levels of cytochrome *c* or perhaps to a demand for metabolic activity were discussed. The characteristics of a relatively anaerobic metabolism in quite a different system were presented by E. Bueding (Johns Hopkins). The parasitic roundworm *Ascaris* has no measurable cytochrome activities and produces hydrogen peroxide during the oxidation of succinate. Studies with various inhibitors indicate that the terminal electron acceptor of the *Ascaris* muscle succinoxidase is a flavoprotein rather than cytochrome oxidase.

H. B. Levy (National Institutes of Health) presented a paper which dealt with metabolic alterations induced in animal cells by virus infection. Generally speaking, glycolysis is stimulated by infection, whereas aerobic respiration is not affected. The data suggest some shift to glycolytic phosphorylation for energy production for virus synthesis. V. Riley (Sloan-Kettering Institute) suggested that a virus-like agent in tumor-bearing mice may be responsible for such observations as a high rate of tumor glycolysis and an elevation of lactic dehydrogenase activity in the blood serum.

J. Papaconstantinou, E. P. Goldberg, and S. P. Colowick (Johns Hopkins and Vanderbilt) analyzed an oxamate-inhibition of aerobic, glucose-grown HeLa cells, demonstrating that the inhibition occurred at the lactic dehydrogenase site. A parallelism exists between oxamate inhibition of glycolysis and of growth of these tumor cells in tissue culture; glycolysis is necessary for growth under these conditions because it maintains the adenosine triphosphate (ATP) level. It is possible that inhibitors such as oxamate may act quite specifically in such cells and be of use in cancer chemotherapy. D. Burk and M. Woods (National Institutes of Health) stressed the hormonal regulation of glycolysis, a control mechanism acting specifically on the hexokinase-catalyzed phosphorylating system. They find that, as malignancy increases, there occurs a progressive lowering of the susceptibility of cellular glycolysis to restraint by anti-insulin hormones and sex steroids.

The effects of various inhibitors and activators on regulatory mechanisms of glycolysis in Ehrlich ascites tumor cells were discussed by R. Wu and E. Racker (New York Public Health Research Institute). One class of compounds, including uridine and inosine, inhibit aerobic glycolysis and increase the Pasteur effect to the range for normal cells. These effects were traced to the lowering of intracellular inorganic phosphate, which is probably the major limiting factor in glycolysis of these tumor cells. F. Lynen (Max Planck Institute, Munich) extended his classical work on the importance of the role of inorganic phosphate in the control of glycolysis in yeast cells. The papers of B. Chance (University of Pennsylvania) and of B. Hess (University of Heidelberg) included data on the steady-state levels of various glycolytic intermediates and coenzymes. Such basic parameters

as the ATP turnover time and the phosphate potential (ATP/ADP·P_i) were determined and related to electron transfer in various metabolic states of ascites tumor cells. The relationship between energy-linked cytochrome oxidation and light-induced electron transfer was also examined.

The full proceedings of the symposium on respiration and fermentation will be published by the Ronald Press. The abstracts of the symposium papers and the shorter contributed papers are scheduled to appear in the January issue of the *Journal of General Physiology*, currently the official publication organ of the Society of General Physiologists.

Newly elected officers are Albert Tyler, president; Teru Hayashi, vice-president; David Bishop, secretary; and Barry Commoner and Andrew Szent-Györgyi, councilors. Thirty-eight new members were voted into the society.

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Forthcoming Events

February

26-2. Current Trends in Nuclear Power, symp., Tucson, Ariz. (L. Weaver, Nuclear Engineering Dept., Univ. of Arizona, Tucson)

27-1. Application of Switching Theory in Space Technology, symp., Palo Alto, Calif. (J. P. Nach, Lockheed Aircraft Corp., Sunnyvale, Calif.)

March

1-3. Florida Acad. of Sciences, Gainesville. (J. B. Lackey, Dept. of Civil Engineering, Phelps Laboratory, Univ. of Florida, Gainesville)

1-3. Fundamental Cancer Research. Conceptual Advances in Immunology and Oncology, symp., annual, Houston, Tex. (Univ. of Texas, Anderson Hospital and Tumor Inst., Houston 25)

1-3. Scintillation and Semiconductor Counters, 8th symp., Washington, D.C. (G. A. Morton, RCA Laboratories, Princeton, N.J.)

2-4. National Wildlife Federation, Denver, Colo. (T. L. Kimball, 1412 16 St., NW, Washington 6)

4-7. Association for Higher Learning, Chicago, Ill. (Chief of Information, Dept. of the Army, Washington 25)

4-8. Association for Supervision and Curriculum Development, Las Vegas, Nev. (Chief of Information, Dept. of the Army, Washington 25)

4-8. Conference on Gas Turbine Power-

Process Industries, American Soc. of Mechanical Engineers, Houston, Tex. (A. B. Conlin, Jr., ASME, 29 W. 39 St., New York 18)

5-9. Analytical Chemistry and Applied Spectroscopy, conf. and exposition of modern laboratory equipment, Pittsburgh, Pa. (C. F. Glick, Applied Research Laboratory, U.S. Steel Corp., Monroeville, Pa.)

5-16. United Nations Economic and Social Council, Committee for Industrial Development, New York, N.Y. (U.N., New York)

8. Problems Relating to Food and Feed Additives, Assoc. of Vitamin Chemists, Chicago, Ill. (H. S. Perdue, Abbott Laboratories, N. Chicago)

9-14. National Science Teachers Assoc., annual, San Francisco, Calif. (M. T. Ballou, Ball State Teachers College, Muncie, Ind.)

10-13. Microminiaturization Congr., New York, N.Y. (C. G. Sedan, American Watchmakers Inst., 18465 James Couzens Hwy., Detroit 35, Mich.)

11-17. American Congr. on Surveying and Mapping—Amer. Soc. of Photogrammetry, annual, Washington, D.C. (G. K. Emminizer, Jr., 106 Valley Rd., Ellicott City, Md.)

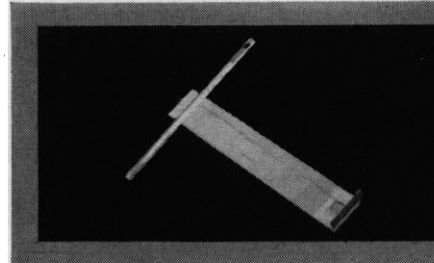
12. Wildlife Soc., Denver, Colo. (C. Gordon Fredine, 5921 Anniston Rd., Bethesda 14, Md.)

12-14. North American Wildlife and

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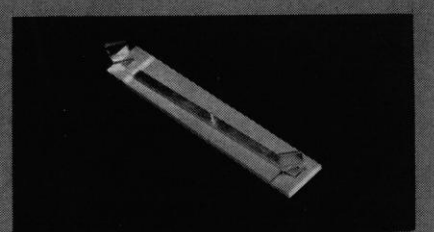
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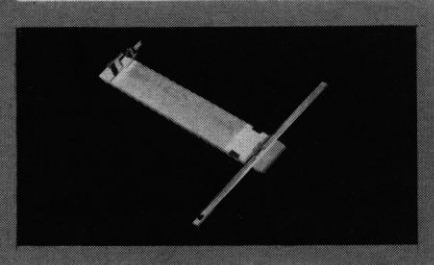


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