Meetings and Societies

Cellular Mechanisms of Physiological Adaptation

The twelfth annual meeting of the Society of General Physiologists was held at the Marine Biological Laboratory, Woods Hole, Massachusetts, 4–6 September 1957. On the first day contributed papers were presented, and the annual business meeting was held.

The next two days were devoted to a symposium, organized by C. Ladd Prosser, on physiological adaptation. Three previous symposia sponsored by the society have been published by the American Physiological Society. Similar arrangements have been made to publish the 1957 symposium.

An important objective of the Society of General Physiologists is to focus the attention of animal, plant, and microbial physiologists on functional properties common to all organisms. The 1957 symposium of the society dealt with cellular mechanisms of physiological adaptation. Animal physiologists have studied adaptation to environmental change largely in terms of responses of the total organism and specific function systems; effects of physical factors in the environment—temperature, oxygen, light—have been much considered. Plant physiologists emphasize selection of genetic varieties as the principle mode of adaptation in plants. Bacterial physiologists have noted genetic adaptation to physical factors but have concentrated on adaptations to changed nutrients and have used enzyme induction as a tool for studying protein synthesis.

In this symposium there was an attempt to bring together the divergent approaches of animal, plant, and microbial physiologists on adaptation. The first four papers dealt with adaptive responses of animals. Kenneth C. Fisher (University of Toronto) presented research by himself and others from the Toronto group on adaptation to temperature and to reduced oxygen, particularly in fish and rodents. Acclimatization occurs as a result of adaptive changes—for example, in locomotor activity and in oxygen consumption—made in response to exposure of the animal to lethal temperatures or to any temperature selected for study. Different adaptive changes are made at different rates during acclimatization. Seasonal acclimation in nature is often not equivalent to laboratory acclimatization.

Herbert Precht (Kiel University) considered enzymatic mechanisms of temperature adaptation in fish and in yeast. Complete acclimatization means that a rate function is the same at a temperature of acclimatization (t_2) as at a previous temperature (t_1); some oxidative enzymes show this, many show slight increase in activity after acclimatization (to a raised temperature), and a few show a decrease. The role of the endocrines in mediating the cellular changes in fish appears to be complex.

The time course of response of poikilotherms to temperature change was discussed by J. W. R. Grainger (Hull University). There is an initial overshoot of most responses (both in animals and in yeast) followed by a steady state which is the usually measured rate response to temperature change. Acclimatization is a much later compensatory change.

Otto Kinne (Kiel University) illustrated adaptation of euryhaline animals to different salinities by showing extensive changes in cell morphology in *Cordylophora* kept at high and low salinities. In this coelenterate as well as in euryhaline gammarids, an interrelation exists between adaptation to salinity and temperature.

Biochemical adaptation in animals was discussed by W. E. Knox (Harvard Medical School); the tryptophan peroxidase-oxidase system of mammalian liver was used as an example. An increase in tryptophan peroxidase-oxidase can be elicited by the adrenal cortex; the enzyme can also be induced by injection of tryptophan, even after adrenalectomy.

F. W. Went (California Institute of Technology) pointed out the difficulties of using the same definition of adaptation for plants as for animals. Strains of plant species living in different environments show striking physiological adaptations. Plants also show direct growth responses to temperature and photoperiod.

The last three papers dealt with adaptation in bacteria. Aaron Novick (University of Chicago) described induction of β-galactosidase and of the permeability-promoting permease in *Escherichia coli*. The sugar substrate or related compounds can induce permease in cells which then are "preinduced" in that they will more readily form β-galactosidase. This adaptation by a change in permeability in certain cells, although environmentally induced, behaves as if it were genetic.

Werner Maas (New York University) showed how final products of a metabolic chain may have a feedback effect on production of intermediates. For example, exogenous arginine inhibits the synthesis of several enzymes involved in arginine synthesis.

Regulation of synthesis of inducible and of constitutive enzymes in bacteria was discussed by Boris Magasanik (Harvard Medical School). Energy-liberating systems interact with enzymes of protein synthesis; a substance such as glucose may inhibit formation of an enzyme such as histidase according to the nature of limiting conditions.

In a summary statement C. L. Prosser (University of Illinois) suggested that the apparent similarity between animals and bacteria (and yeast) in adaptation by enzyme induction may be the result of chemical integration throughout each individual organism, while cells of plants are more independent, and plants rely more on genetic variation for adaptation. It was also suggested that enzyme induction may operate in adaptation to physical factors such as temperature if parallel and interacting enzyme systems are differentially affected by the physical factors and if intermediate compounds accumulate and act to induce or inhibit enzyme synthesis.

It is hoped that the symposium may help animal, bacterial, and plant physiologists concerned with adaptations to the environment to recognize common problems and to apply methods which have been useful with one kind of organism to another kind.

Results of the mail balloting for officers and council were announced at the business meeting [*Science* **126**, 659 (1957)]. F. H. Johnson and K. S. Cole were elected to serve two-year terms as councilors of the Society of General Physiologists. It was reported previously [*Science* **126**, 659 (1957)] that they had been elected as representatives to the AAAS Council.

The abstracts of the contributed papers were published as a supplement in the October issue of the *Journal of Cellular and Comparative Physiology*.

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Canadian Biological Societies

The Board of the Canadian Federation of Biological Societies was formed in Ottawa, 11 October 1957. The federation comprises four member societies—the Canadian Physiological Society, the Pharmacological Society of Canada, the Canadian Association of Anatomists, and the Canadian Biochemical Society. The federation will hold its first annual meeting in Kingston, Ontario, in June 1958. For information, write to Dr. E. H. Bensley, Montreal General Hospital, Montreal 25, Quebec.

Reticuloendothelial System

The third International Symposium on the Reticuloendothelial System will be held 28–30 August in St. Margherita Ligure, Italy. This will be a limited symposium with 30 speakers and 20 to 40 auditors. The subjects which will be covered are the reticuloendothelial system and radiation, the RES and steroids, and the RES and immunity, including protein synthesis, antibody synthesis, antigens, endotoxins, properdin, and tumors.

It is anticipated that funds will be available to defray the cost of the Americans participating in this symposium. Titles and abstracts should be submitted in duplicate *by 15 February* to Dr. John Heller, New England Institute for Medical Research, Ridgefield, Conn., or Dr. Alberto Marmont, Clinica Medica Universitaria, Genoa, Italy.

IRE National Convention

The National Convention of the Institute of Radio Engineers, Inc., will be held in New York, 24–27 March. Some 275 papers will be presented during 55 sessions. The high point of the program will be two special symposia, one on electronics in space, the other on electronic systems in industry.

The Radio Engineering Show has been expanded to accommodate approximately 850 exhibitors. The latest in electronic equipment will be on display, much of it for the first time. Further information may be obtained from the IRE, 1 E. 79 St., New York 21, N.Y.

Forthcoming Events

February

19–21. Genetics Soc. of Canada, 3rd annual, Edmonton, Alberta, Canada. (L. P. V. Johnson, Dept. of Plant Science, Univ. of Alberta, Edmonton.)

20–21. Transistor and Solid State Circuits Conf., Philadelphia, Pa. (J. H. Milligan, Jr., Dept. of Electrical Engr., New York Univ., New York 53.)

22–25. American Educational Research Assoc., St. Louis, Mo. (F. W. Hubbard, AERA, 1201 16th St., NW, Washington 6.)

24–28. American Soc. of Civil Engineers, Chicago, Ill. (W. W. Wisely, ASCE, 33 W. 39 St., New York 18.)

March

1. Junior Solar Symposium, Tempe, Ariz. (Association for Applied Solar Energy, 3424. N. Central Ave., Phoenix, Ariz.)

1–3. National Wildlife Federation, St. Louis, Mo. (E. F. Swift, NWF, 232 Carroll St., NW, Washington 12.)

3. Wildlife Soc., annual, St. Louis, Mo. (D. L. Leedy, U.S. Fish and Wildlife Service, Washington 25.)

5–6. Gas Conditioning Conf., 7th annual, Norman, Okla. (M. L. Powers, Extension Div., Univ. of Oklahoma, Norman.)

6–8. Fundamental Cancer Research, 12th annual, Houston, Tex. (W. K. Sinclair, M. D. Anderson Hospital and Tumor Inst., Univ. of Texas, Houston 25.)

10–13. American Assoc. of Petroleum Geologists, annual, Los Angeles, Calif. (R. H. Dott, AAPG, Box 979, Tulsa 1, Okla.)

10–13. Society of Economic Paleontologists and Mineralogists, annual, Los Angeles, Calif. (R. H. Dott, Box 979, Tulsa, Okla.)

16–21. Nuclear Engineering and Sci-

ence Cong., Chicago, Ill. (D. I. Cooper, *Nucleonics*, 330 W. 42 St., New York.)

17–21. National Assoc. of Corrosion Engineers, 14th annual, San Francisco, Calif. (NACE, Southern Standard Bldg., Houston 2, Tex.)

18–20. Amino Acids and Peptides, Ciba Foundation symp. (by invitation), London. England. (G. E. W. Wolstenholme, 41 Portland Pl., London, W.1.)

20–22. Michigan Acad. of Science, Arts and Letters, annual, Ann Arbor. (R. F. Haugh, Dept. of English, Univ. of Michigan, Ann Arbor.)

20–22. Pulmonary Circulation Conf., Chicago, Ill. (Wright Adams, Chicago Heart Assoc., 69 W. Washington St., Chicago 2.)

20–23. International Assoc. for Dental Research, annual, Detroit, Mich. (D. Y. Burrill, Univ. of Louisville, School of Dentistry, 129 E. Broadway, Louisville 2, Ky.)

23–26. American Assoc. of Dental Schools, annual, Detroit, Mich. (M. W. McCrea, 42 S. Greene St., Baltimore 1, Md.)

23–29. American Soc. of Photogrammetry, 24th annual, jointly with American Cong. on Surveying and Mapping, 18th annual, Washington, D.C. (C. E. Palmer, ASP, 1515 Massachusetts Ave., NW, Washington 5.)

24–26. Aero Medical Assoc., 29th annual, Washington, D.C. (T. H. Sutherland, Box 26, Marion, Ohio.)

24–27. Institute of Radio Engineers, natl. conv., New York. (G. W. Bailey, IRE, 1 E. 79 St., New York 21.)

26–28. American Power Conf., 20th annual, Chicago, Ill. (Illinois Inst. of Technology, 35 W. 33 St., Chicago 16.)

27–29. Mechanisms of Hypersensitivity, 8th internatl. symp., Detroit, Mich. (W. J. Nungester, Dept. of Bacteriology, Univ. of Michigan, Ann Arbor.)

27–29. National Science Teachers Assoc., 6th natl., Denver, Colo. (R. H. Carleton, NSTA, 1201 16 St., NW, Washington 6.)

27–29. Optical Soc. of America, annual, Washington, D.C. (K. S. Gibson, National Bureau of Standards, Washington 25.)

29. South Carolina Acad. of Science, annual, Charleston. (Miss M. Hess, Dept. of Biology, Winthrop College, Clemson, S.C.)

29–30. American Psychosomatic Soc., 15th annual, Cincinnati, Ohio. (T. Lidz, 551 Madison Ave., New York 22.)

30–3. American College Personnel Assoc., annual, St. Louis, Mo. (L. Riggs, DePauw Univ., Greencastle, Ind.)

April

1–3. Corrosion Control, 5th annual conf., Norman, Okla. (M. L. Powers, Extension Div., Univ. of Oklahoma, Norman.)

2–4. American Assoc. of Anatomists, annual, Buffalo, N.Y. (L. B. Flexner, Dept. of Anatomy, School of Medicine, Univ. of Pennsylvania, Philadelphia 4.)

2–4. Instruments and Regulators Conf., Newark, Del. (W. E. Vannah, Control Engineering, 330 W. 42 St., New York 36.)

4–5. Southern Soc. for Philosophy and Psychology, annual, Nashville, Tenn. (W. B. Webb, U.S. Naval School of Aviation Medicine, Pensacola, Fla.)

7–11. American Assoc. of Cereal Chemists, annual, Cincinnati, Ohio. (J. W. Pence, Western Utilization Research Laboratories, Albany, Calif.)

8–10. Electronic Waveguides Symp., New York. (J. Fox, Microwave Research Inst., Polytechnic Inst. of Brooklyn, 55 Johnson St., Brooklyn 1, N.Y.)

9–12. National Council of Teachers of Mathematics, Cleveland, Ohio. (M. H. Ahrendt, NCTM, 1201 16 St., NW, Washington 6.)

9–14. Applied Psychology, 13th internatl. cong., Rome, Italy. (L. Meschieri, National Inst. of Psychology, Rome.)

10–11. American Inst. of Chemists, annual, Los Angeles, Calif. (L. Van Doren, AIC, 60 E. 42 St., New York 17.)

10–12. Biometric Soc., ENAR, Gatlinburg, Tenn. (T. W. Horner, General Mills, Inc., 400 Second Ave. South, Minneapolis 1, Minn.)

10–12. National Speleological Soc., annual, Gatlinburg, Tenn. (G. W. Moore, Geology Dept., Yale Univ., New Haven, Conn.)

10–12. Ohio Acad. of Science, annual, Akron, Ohio. (G. W. Burns, Dept. of Botany, Ohio Wesleyan Univ., Delaware, Ohio.)

11. Vitamin B-12 Symp., New York, N.Y. (Miss J. Watson, 451 Clarkson Ave., Brooklyn 3, N.Y.)

11–12. Eastern Psychological Assoc., annual, Philadelphia, Pa. (G. Lane, Dept. of Psychology, University of Delaware, Newark.)

11–18. Horticultural Cong., 15th internatl., Nice, France. (Secretariat General, 84, rue de Grenelle, Paris 7e, France.)

13–14. American Soc. for Artificial Internal Organs, Philadelphia, Pa. (G. Schreiner, Georgetown Univ. Hospital, Washington 7.)

13–18. American Chemical Soc., 133rd, San Francisco, Calif. (R. M. Warren, ACS, 1155 16 St., NW, Washington 6.)

13–19. Federation of American Societies for Experimental Biology, annual, Philadelphia, Pa. (M. O. Lee, FASEB, 9650 Wisconsin Avenue, Bethesda 14, Md.)

14–16. Automatic Techniques Conf., Detroit, Mich. (J. E. Eiselein, RCA, Bldg. 10–7, Camden 2, N.J.)

14–18. American Assoc. of Immunologists, annual, Philadelphia, Pa. (F. S. Cheever, Graduate School of Public Health, Univ. of Pittsburgh, Pittsburgh 13, Pa.)

14–18. American Soc. for Experimental Biology, annual, Philadelphia, Pa. (J. F. A. McManus, Univ. of Alabama Medical Center, Birmingham.)

14–18. American Soc. of Biological Chemists, annual, Philadelphia, Pa. (P. Handler, Dept. of Biochemistry, Duke University School of Medicine, Durham, N.C.)

15–17. Gas Measurement, 34th annual conf., Norman, Okla. (M. L. Powers, Extension Div., Univ. of Oklahoma, Norman.)

16–25. Instruments, Electronics and Automation Conf., London, England. (Industrial Exhibitions Ltd., 9 Argyll St., London, W.1.)

17–19. Association of Southeastern Biologists, annual, Tallahassee, Fla. (J. C. Dickinson, Jr., Dept. of Biology, Univ. of Florida, Gainesville.)

17–19. Eastern Colleges Science Conf., 12th annual, Wilkes-Barre, Pa. (Mrs. E. Stevens, Wilkes College, Wilkes-Barre.)

18. Iowa Acad. of Science, annual, Des Moines. (C. H. Lindahl, Dept. of Mathematics, Iowa State College, Ames.)

18–19. Arkansas Acad. of Science, annual, Little Rock. (L. F. Bailey, Botany Dept., Univ. of Arkansas, Fayetteville.)

19–21. American College of Apothecaries, Los Angeles, Calif. (R. E. Abrams, Hamilton Court, 39th and Chestnut St., Philadelphia, Pa.)

20–22. American Assoc. of Colleges of Pharmacy, annual, Los Angeles, Calif. (G. L. Webster, College of Pharmacy, Univ. of Illinois, 808 S. Wood St., Chicago 12.)

20–23. Chemical Engineering Conf., Canada-United States, Montreal, Quebec. (H. R. L. Streight, DuPont Company of Canada, P.O. Box 660, Montreal.)

21–23. American Oil Chemists' Soc., Memphis, Tenn. (Mrs. L. R. Hawkins, AOCS, 35 E. Wacker Dr., Chicago 1, Ill.)

21–28. American Industrial Hygiene Assoc., annual, Atlantic City, N.J. (G. D. Clayton, George D. Clayton and Associates, 14125 Prevost, Detroit 27, Mich.)

(See issue of 17 January for comprehensive list)