Scientific Meetings

Physiology of Invertebrates

A conference on Recent Advances in the Physiology of Invertebrates was held 12–16 September at the University of Oregon in Eugene; it was attended by about 40 invited guests. The meeting was sponsored by the University of Oregon, the Tektronix Foundation, and the National Science Foundation. It was originally planned by the University of Washington to be held in Seattle, but a number of the speakers who had been invited withdrew in protest over the action of the administration in connection with the proposed visit of J. Robert Oppenheimer last winter and the meeting was cancelled. At the invitation of the University of Oregon, the organizing committee composed of B. T. Scheer, chairman, L. H. Kleinholz, A. W. Martin, and T. H. Bullock, reopened plans.

The subjects discussed covered a wide but by no means comprehensive assortment of topics, with particularly strong representation from the areas of neuromuscular physiology, the effects of hormones, and the management of body fluids and solutes.

T. H. Waterman (Yale) reported recent physiological work on the compound eye. Records of spike activity from the optic ganglia of crabs and lobsters giving strong indication of integrative interaction between ommatidia were received with particular interest. The sensory capabilities of *Daphnia* and a wide selection of marine zooplankters formed an element of special remark in the paper of E. R. Baylor (Michigan) on vertical migration. Responses to changes of 0.1 *p*H unit, to changes of 75 mm of water pressure, to slowly changing temperature, as well as to color, polarized light, x-rays, gamma rays, and oxidizing and reducing substances; differentiation of function between the compound and the nauplius eye, and the polarization of light by phytoplankters were among the points he described. L. M. Passano (Yale) surveyed the adaptations involved in prey-predator relationships, especially in lower invertebrates, and H. Mittelstaedt (Wilhelmshaven) analyzed the accurate strike of the preying mantid in food capture in terms of the interaction of sensory input from eyes and neck proprioceptors and motor output to neck and leg muscles. T. H. Bullock (U.C.L.A.) summarized the properties and mechanisms that may account for integration at the level of small groups of neurons, analyzing as examples the formation of patterned bursts by the cardiac ganglion of lobsters and the discrimination between signal and noise in afferent centers.

The rapid advances in analytic neurophysiology were well illustrated in the series of papers by G. Hoyle (Glasgow), E. G. Boettiger (Connecticut), J. W. S. Pringle (Cambridge), and C. A. G. Wiersma (California Institute of Technology) on the control of muscle in insects and crustaceans. Although but few muscles are involved and only 2 to 3 nerve fibers per muscle unit, the same movement is rarely executed twice in exactly the same way by the intact locust. Important progress has occurred in the understanding of fibrillar muscle, which contracts many times for each muscle action potential. A click mechanism is not essential, but a click can be introduced into a system that lacks it by the action of certain muscles. Tension-length curves at all phases of movement have elucidated the conditions that produce a separation of the contraction process from the excitation of the muscle membrane indicating a third process between these two. Pringle aroused much interest by offering a theory of synchronized ATP splitting at sites along contractile elements with unusually strong lateral bonds. A trend documented by each speaker, in particular by Wiersma, is the increased knowledge of locally differentiated modes of control among muscles and even within a single muscle.

F. A. Brown, Jr. (Northwestern) described his recent experiments on rhythms; he concluded that barometric pressure and cosmic ray cycles may be involved. A paper by C. L. Prosser (Illinois) that called for more work in fields of zoophysiology bordering on ecology and evolution elicited vigorous discussion pro and con.

Certain areas of invertebrate endocrinology, especially the effects on metabolism, growth and differentiation, neurosecretory sources, storage and release, and a suspected neural transmitter substance were discussed in papers by J. H. Welsh (Harvard), L. H. Kleinholz (Reed), D. Bodenstein (Army Chemical Center) and B. T. Scheer (Oregon). 5-Hydroxytryptamine was suggested by Welsh to be a normal excitatory transmitter in mollusks, but others wished to wait for more evidence. The recently discovered y-organ in crustaceans may produce a molt-accelerating hormone. Contradictory results of eyestalk removal in the same species of shrimp, reported from different laboratories, were discussed. The analysis of hormones and target reactivity has reached a level of considerable sophistication in insects, considering that the hormones must still be defined for the most part by their effects. A development of general interest is the denial, for decapod crustaceans, of the usual rule that energy metabolism draws in order upon glucose, glycogen, lipid, and protein; the first two appear to be involved only in chitin synthesis.

J. D. Robertson (Glasgow) reviewed the information available on ionic regulation in invertebrates from marine, brackish, and fresh water and emphasized the diversity among species of crustaceans and mollusks, for example in plasma K^+ and Mg^{++}, urinary NH_4^+, intra- to extracellular Cl^-, and anion deficit. The group was impressed by the opportunity for studies correlating membrane potentials and behavior with these data. A. W. Martin (University of Washington) illustrated the recent advances in quantitative physiology of excretory processes by measurements of filtration, reabsorption, and secretion in the giant African snail and an octopus. Long standing problems such as the pressure in the lumen of solenocytes, the meaning of different arrangements of nephridia, vacuole formation in excretory epithelia, and the sites of the differential movements of materials appear to be amenable to solution by extension of these methods.

The group, including discussants, felt that the occasion was unique in bringing together such a representation of physiologists of lower animals and that the intangible benefits justified consideration of future meetings at intervals. Visits to the university's physiological laboratories and to the Oregon Institute of Marine Biology on Coos Bay were enjoyable breaks in an intensive program. It is planned to publish the principal contributions in book form under the editorship of B. T. Scheer.

THEODORE H. BULLOCK

Department of Zoology, University of California, Los Angeles

Meeting Notes

■ The future course of engineering education was the theme of a conference of officials from 21 eastern colleges and universities that was held at New York University on 3 Dec. Some 250 delegates to the fall meeting of the Middle Atlantic Section, American Society for Engineering Education, discussed means of carrying out the recommendations of an exhaustive national ASEE report that was made after a 3-year study.

The key provision of the report is a recommendation for more basic studies, principally in physics and mathematics, in engineering programs. This would mean a reduction in the number of courses in highly specialized subdivisions of engineering fields.

■ The 1955 winter meeting on the Pacific Coast of the American Physical Society will take place at the University of Southern California, 28–30 Dec. This meeting is being held in connection with the 75th anniversary of the founding of the University of Southern California. In view of the occasion, F. D. Fagg, Jr., president of the university, will deliver a message of greeting at the APS banquet. His address will be followed by a talk by Lee A. DuBridge, president of California Institute of Technology on "Physicists wanted." The presiding officer will be R. T. Birge.

There will be 33 invited papers and 96 contributed papers. This has led to the scheduling of seven sessions of invited papers and ten sessions primarily of contributed papers.

The somewhat larger-than-usual number of invited papers is caused by the last-moment arrangement of a symposium on the antiproton. The symposium is listed as session K of the program, 2:45 P.M., 29 Dec. In the anticipation that this session will be better attended than most, it was decided to have no other papers after 2:45 on that afternoon. This arrangement necessitated some distortions in the time schedule for the rest of the program.

For additional information write to the local secretary for the Pacific Coast, W. A. Nierenberg, University of California, Berkeley 4, Calif.

■ The first International Congress of Human Genetics will be held in Copenhagen, Denmark, 1–6 Aug. 1956. Any person interested in human genetics, and especially in medical genetics, is invited to take part in the congress. A provisional program and further information may be obtained from the First International Congress of Human Genetics, University Institute for Human Genetics, 14, Tagensvej, Copenhagen, N., Denmark.

■ Many urgent problems concerning poliomyelitis vaccination were explored by a group of 12 medical scientists who met in Stockholm, Sweden, from 21 to 25 Nov. under the auspices of the World Health Organization. This was the first exchange of knowledge and experience on the subject among European, American, and South African research and health workers.

WHO organized the meeting in an effort to bring together sufficient authoritative information on the numerous problems associated with poliomyelitis to enable the organization to give sound practical guidance to national health authorities. The study group reviewed the facts now available from a number of countries relating to field trials of poliomyelitis vaccine, the laboratory testing of vaccines, and the problems of their production in large quantities.

Members of the study group participated as independent scientists and not as representatives of their governments. They met in closed committee, and their recommendations will be addressed to the director-general of WHO.

Jonas E. Salk of the University of Pittsburgh School of Medicine had accepted an invitation to the meeting, but at the last moment he was prevented from attending; however, he contributed a working paper for the group's consideration. The other persons invited to attend the meeting were F. P. Nagler of Canada, H. von Magnus of Denmark, P. Lépine of France, R. Haas of Germany, Karl Evang of Norway, J. H. S. Gear of South Africa, S. Gard of Sweden, W. L. M. Perry and E. T. C. Spooner of England, and A. D. Langmuir, J. R. Paul, and A. B. Sabin of the United States.

■ A symposium on the "Contribution of systematics to evolutionary studies" was held at the Missouri Botanical Garden, 4–5 Nov. This was the second annual meeting of botanists and zoologists, principally of the Midwest, to be held at the garden for the purpose of encouraging an exchange of ideas on systematic problems fundamental to biology. Sixty-two staff members and 59 graduate students from 31 institutions and 15 states were in attendance.

Karl P. Schmidt of the Chicago Natural History Museum and Reed C. Rollins of the Gray Herbarium, Harvard University, guided the discussions. A few short papers were presented on morphological variation, geographical distribution, phylogenetic trees, and the nature and origin of taxonomic categories. Each paper served as a stimulus to extended discussion.

The symposium raised many questions for which there were no ready answers. It also provided concrete information on clines, taxonomic methods, and geographical step-by-step replacement of animal and plant species. The symposium was generously supported by a grant from the National Science Foundation, which made it possible for many, particularly graduate students, to attend.

■ The Society of Nuclear Medicine is soliciting papers for the 1956 meeting, which will take place at the Hotel Utah, Salt Lake City, on 21–23 June. Titles and outlines of proposed papers should be sent *by 1 Jan.* to Dr. Simeon Cantril, Tumour Institute, Swedish Hospital, Seattle, Wash.

Forthcoming Events

January

17–20. American Pomological Soc., Rochester, N.Y. (R. B. Tukey, Horticulture Dept., Purdue Univ., Lafavette, Ind.)

18–20. Soc. of Plastics Engineers, 12th annual, Cleveland, Ohio. (Public Relations Dept., E. I. DuPont de Nemours, Wilmington, Del.)

20–27. Pan American Cong. of Gastro-Enterology, 5th, Havana, Cuba. (N. M. Stapler, 1267 J. E. Uriburu, Buenos Aires, Argentina.)

23–26. American Soc. of Heating and Air-Conditioning Engineers, Cincinnati, Ohio. (A. V. Hutchinson, ASHAE, 62 Worth St., New York 13.)

23–27. Inst. of Aeronautical Sciences, New York, N.Y. (S. P. Johnston, IAS, 2 E. 64 St., New York 21.)

26–27. Western Spectroscopy Assoc. 3rd annual, Berkeley, Calif. (J. W. Otvos, Shell Development Co., Emeryville, Calif.)

27–28. Conf. on Protein Metabolism, 12th annual, New Brunswick, N.J. (W. H. Cole, Rutgers Univ., New Brunswick.)

27–28. Western Soc. for Clinical Research, 9th annual, Carmel-by-the-Sea, Calif. (A. J. Seaman, Univ. of Oregon Medical School, Portland 1.)

30–1. International Conf. on Fatigue in Aircraft Structures, New York, N.Y. (A. M. Freudenthal, 716 Engineering, Columbia Univ., New York 27.)

30–3. American Inst. of Electrical Engineers, New York, N.Y. (N. S. Hibshman, AIEE, 33 W. 39 St., New York 18.)

31–3. American Soc. of Sugar Beet Technologists, 9th biennial conf., San Francisco, Calif. (Western Beet Sugar Producers, Inc., 461 Market St., San Francisco 5.)

31–4. American Physical Soc., New York, N.Y. (K. K. Darrow, Columbia Univ., New York 27.)

February

1. National Advisory Committee on Local Health Depts., 8th annual, New York, N.Y. (National Health Council, 1790 Broadway, New York 19.)

1–2. Armour Research Foundation Mid-

west Welding Conf., Chicago, Ill. (H. Schwartzbart, Armour Research Foundation, Illinois Inst. of Technology, Chicago.)

1–3. Case Studies in Operations Research, Cleveland, Ohio. (Operations Research Group, Dept. of Engineering Administration, Case Inst. of Technology, 10900 Euclid Ave., Cleveland 6.)

2–3. National Symposium on Microwave Techniques, Philadelphia, Pa. (S. M. King, Inst. of Radio Engineers, 1 E. 79 St., New York 21.)

5–8. National Citizens' Planning Conf., Washington, D.C. (Miss H. James, 901 Union Trust Bldg., Washington 5.)

9–10. Soc. of American Military Engineers, annual, Chicago, Ill. (D. A. Sullivan, 72 W. Adams St., Chicago 90.)

16–17. National Conf. on Transistor Circuits, 3rd, Philadelphia, Pa. (J. D. Chapline, Remington Rand, Inc., 2300 W. Allegheny Ave., Philadelphia 29.)

19–23. American Inst. of Mining and Metallurgical Engineers, New York, N.Y. (E. O. Kirkendall, AIME, 29 W. 39 St., New York 18.)

19–23. Soc. of Economic Geologists, New York, N.Y. (O. N. Rove, Union Carbide and Carbon Corp., New York 17.)

20–22. American Educational Research Assoc., annual, Atlantic City, N.J. (F. W. Hubbard, AERA, 1201 16 St., NW, Washington 6.)

23–25. National Soc. of College Teachers of Education, Chicago, Ill. (C. A. Eggertsen, School of Education, Univ. of Michigan, Ann Arbor.)

24–25. American Physical Soc. Houston, Tex. (K. K. Darrow, APS, Columbia Univ., New York 27.)

26–29. American Inst. of Chemical Engineers, Los Angeles, Calif. (F. J. Van Antwerpen, AIChE, 25 W. 45 St., New York 36.)

28–29. Scintillation Counter Symposium, 5th, Washington, D.C. (G. A. Morton, RCA Laboratories, Princeton, N.J.)

March

12–16. National Assoc. of Corrosion Engineers, 12th annual, New York, N.Y. (Secretary, NACE, Southern Standard Bldg., Houston 2, Tex.)

14–17. National Science Teachers Assoc., Washington, D.C. (R. H. Carleton, NSTA, 1201 16 St., NW, Washington 6.)

15–16. Food Physics Symposium, 1st international, San Antonio, Tex. (C. W. Smith, Southwest Research Inst., San Antonio.)

15–17. American Orthopsychiatric Assoc., 33rd annual, New York, N.Y. (M. F. Langer, AOA, 1790 Broadway, New York 19.)

15–17. American Physical Soc., Pittsburgh, Pa. (K. K. Darrow, APS, Columbia Univ., New York 27.)

15–17. Kappa Delta Pi, annual, Stillwater, Okla. (E. I. F. Williams, 238 E. Perry St., Tiffin, Ohio.)

16–18. International Assoc. for Dental Research, St. Louis, Mo. (D. Y. Burrill, 129 E. Broadway, Louisville 2, Ky.)

18–24. American Soc. of Photogrammetry, annual, joint meeting with American Cong. on Surveying and Mapping, Washington, D.C. (ACSM–ASP, Box 470, Washington 4.)

19–22. American Acad. of General Practice Scientific Assembly, 8th annual, Washington, D.C. (AAGP, Broadway at 34th, Kansas City 11, Mo.)

19–22. Inst. of Radio Engineers National Convention, New York. (E. K. Gammett, IRE, 1 E. 79 St., New York 21.)

19–23. American Soc. of Tool Engineers, Chicago, Ill. (H. C. Miller, Armour Research Foundation, 35 W. 33 St., Chicago 16.)

21–22. National Health Forum, New York, N.Y. (T. G. Klumpp, National Health Council, 1790 Broadway, New York 19.)

21–23. American Power Conf., 18th annual, Chicago, Ill.. (R. A. Budenholzer, Illinois Inst. of Technology, Chicago 16.)

21–24. American Astronomical Soc., Columbus, Ohio. (J. A. Hynek, McMillin Observatory, Ohio State Univ., Columbus 10.)

23–24. Eastern Psychological Assoc., Atlantic City, N.J. (G. G. Lane, Univ. of Delaware, Newark.)

24–25. American Psychosomatic Soc., 13th annual, Boston, Mass. (T. Lidz, APS, 551 Madison Ave., New York 22.)

(See 16 Dec. issue for comprehensive list)