Meetings and Societies

Biologists Meet at Stanford

The first West Coast meeting of biological societies, under the sponsorship of the American Institute of Biological Sciences, was held at Stanford University, Palo Alto, California, 25–29 August 1957. At the same time and place the Pacific Division of the American Association for the Advancement of Science met. Thirty-six professional societies were officially represented, and 1600 research papers were read. Official registration was 3250, and total attendance exceeded 4000. Preceding the convention period and over the long September week-end following, ten extensive field trips were organized by various societies. One particularly hardy group transected California, camping in the high Sierra on the way. Another group collected intertidal marine algae at dawn on the beaches at Monterey. Horticulturalists took advantage of the nearby experiment stations and of the unusual agricultural areas of California. The 1957 exhibit was one of the largest ever held in connection with these annual meetings. Biologists showed a keen interest in the newly developed laboratory equipment and commercial products that were on display. Again this year the Biological Photographic Association exhibited a number of salon photographs of biological subjects. The AIBS Placement Service, available to all registrants at the convention, arranged interviews for four days.

The general AIBS meeting for all participating societies featured an address by H. Bentley Glass (Johns Hopkins University), retired president of the institute, on "The Responsibility of Biologists." Speaking to a capacity audience, Glass said: "Today we stand on the verge of biological discoveries of an equally revolutionary and potentially devastating kind, which will require all our wisdom to control. It is a frightening responsibility that rests upon us, as biologists, to see that these powers are used for good and not for harm." Speaking of the role of biologists in the community as a whole, Glass said: "I would feel no confidence in asking the profession of biology to take over the regulation of our government and our society. There are so few biologists who have gained anything like the required experience by entering into such public affairs as face citizens every day and everywhere. There are so few biologists who endeavor to make their biology count for anything outside the laboratory and the classroom." The speaker continued: "Our real social function as biologists, it seems to me, lies in education—the vast majority of our people have little understanding of science as a way of thinking or as a method of seeking answers to problems. . . . It must also be true that a nation with a microscopically few scientists molding and altering the lives of people and with a populace uncomprehending, superstitious, and resisting, likewise cannot endure. . . . My reasoning thus leads me back to the fundamental primary obligation of biologists as of all other scientists, the stern duty to teach—to spread as widely as possible among both young and old the comprehension of the bases of a scientific civilization." In conclusion, Glass stated: "We face new problems which are likely to become critical in the next years. The complete domination of scientific research by the holders of the purse strings is ominous, even though until now our foundations and government agencies have pursued policies of the most liberal kind. How long may that be expected to continue if the people and the representatives of the people feel that science is a useful servant or slave to minister to the needs of society as bidden?"

The annual meeting of the Pacific Division of the AAAS featured a presidential address by J. Murray Luck (Stanford University), "Man against His Environment: the Next Hundred Years" [*Science* **216**, 903 (1957)].

The subjects of radiation and fallout hazards occupied a considerable portion of everyone's discussions and were covered in numerous papers. Several symposia offered the latest data on fallout, the ecological aspects of the situation, and the dangers of strontium-90 and the absorption of this element by man, plant, and animal. Of the many papers presented, probably one of the most significant was that offered by Michael A. Bender (Johns Hopkins University). Bender's experiments gave sharp indication that the 10-roentgen maximum permissible average dose of radiation (to the reproductive organs from conception to age 30) given in the report by the National Academy of Sciences may be too high. Bender for the first time submitted normal human cells to known doses of radiation and measured the amount of resulting damage. In cells examined two days after irradiation, 25 roentgens of x-rays had produced roughly six chromosome breaks per 100 cells, and 50 roentgens had produced more than double this number. Bender reported, "The breakage rate found in these experiments is much higher than that which has been generally assumed to occur for such low dosage. In fact, the present experiments, taken by themselves, lend great weight to the belief of many geneticists that there is no safe dose of radiation."

In contrast, a group from the Argonne National Laboratory (M. P. Finkel, B. O. Biskis, and G. M. Scribner), using mice, estimated the biological hazards of strontium-90. At high doses the mice died of acute and subacute irradiation disease. At intermediate doses there were many lymphoid tumors. As the dose decreased the death rate and cancer rate decreased. In the low dose areas the most sensitive measure of effect thus far seen has been the reduction in life span. The threshold for this effect appears to be an injected dose of 0.23 micromicrocurie per gram of mouse, or a retained dose of approximately 0.03 micromicrocurie per gram of mouse. If a direct comparison is made to man—and there are many sources of error in such comparisons—this corresponds roughly to twice the maximum permissible level in man and to 1000 times the most pessimistic estimate of current human contamination from fallout.

H. Boroughs, S. Townsley, and W. Ego (University of Hawaii Marine Laboratory) found that the small shrimp *Artemia,* a common and abundant fish food, became radioactive after it was placed in sea water which contained strontium-90. However, most of the radioactivity was due to yttrium rather than to strontium; only about 2 percent of the radioactivity came from the strontium-90. If other shrimplike animals select yttrium over strontium, it may be that marine fish do not become nearly as radioactive as is believed. Unfortunately, it is also known that other animals in the sea do concentrate radiostrontium and that these animals are in turn used as food by fish, and therefore by man.

Using amoebae, E. W. Daniels and H. H. Vogel, Jr. (Argonne National Laboratory) obtained interesting information on how to prevent the death of lethally irradiated animals. Following

two continual lethal doses of fission neutrons, protoplasm in varying amounts was transferred from nonirradiated amoebae to the irradiated cells. Ninety-one percent of the amoebae thus treated survived for the period of experimental study. Most of the cells that lived were capable of giving rise to large cultures of offspring. In an effort to determine which parts or components of the protoplasm were necessary for recovery, nonirradiated cells were centrifuged, and the light and heavy portions of their protoplasm were separated. It was found that the middle and centrifugal (heavy) thirds are about as effective in preventing death as whole, noncentrifuged protoplasm.

Lauren R. Donaldson (University of Washington Applied Fisheries Laboratory), told biologists of work carried out in the Pacific Ocean to trace the dispersion of fallout radioactivity. After the detonations in June 1956 at the Pacific Proving Ground, an area of 78,000 square miles of ocean immediately surrounding Bikini and Eniwetok atolls was outlined as radioactive. In September a second survey trip was made. By then radioactive decay and dilution had greatly lowered the activity. But the slow movement of the tagged water mass had put the fringes of radioactivity some hundreds of miles farther westward. In September the average ratio of activity in plankton to activity in sea water was found to be 2500 to 1. It was apparent that the plankton was controlling the westward drift of radioactivity. At this time, too, it was noted that there were differences in the isotopic content of plankton samples collected north of Eniwetok and those collected 500 miles to the west. One of the unique findings was that nonfission products rather than the radioactive products of the nuclear fission accounted for the major parts of the long-lived residual radiation. These nonfission products were radioactive iron, manganese, cobalt, and zinc. In some instances the nonfission products produced 90 to 100 percent of the radiation detectable in the samples.

In the long battle against plant diseases, a possible means of preventing virus infection was announced by T. C. Allen, Jr., and R. P. Kahn (Army Chemical Corps Biological Warfare Laboratories). Extracts from rice plants were found to inhibit the growth of several plant viruses. Several different parts of several rice varieties were used, notably rice "juice" from crushed leaves, and rice polish, the by-product remaining after rice kernels are milled. Rice polish, in general, proved to be the most effective of all extracts. It did not seem to matter whether the polish was applied before or immediately after inoculation of the virus. Tobacco mosaic virus, common bean mosaic virus, tobacco necrosis virus and Southern bean mosaic virus and pod mottle virus were used in the experiments. The results were uniformly good, and in several cases 100 percent inhibition resulted. Rice polish seemed to exert an immunizing or chemotherapeutic effect. Its use may offer a more rapid approach to control than the present practice of developing disease-resistant strains of plants.

Emil Witschi (State University of Iowa) reported that he has been able to distinguish between male and female embryos as early as the third week of development. Witschi used a modification of the sex chromatin technique of M. Barr, Canadian neurologist, who found male and female patterns among the stainable granules of the nuclei of the large cells of the embryonic heart. At the same time, Witschi reported that sex reversals are known to occur occasionally in human embryos during the early weeks of pregnancy. Instrumental in such reversals are degenerative changes in the germ cell from various causes—for example, overripeness of the egg at fertilization.

An interchange of many land mammals, including man, doubtless took place over a land bridge between the North American and Asiatic continents during Quaternary and Tertiary times, reported W. H. Burt (University of Michigan). Over one-half of the land mammals of western North America have close relatives in Asia, and some northern mammals are circumpolar in distribution. Examples of these are the gray wolf, arctic fox, brown bear, ermine, least weasel, wolverine, arctic ground squirrel, moose, caribou, and some of the small shrews, voles, and lemmings. The Eskimo may also be included in this category. Among the North American mammals that failed to cross the land bridge are kangaroo rats, pocket mice, pocket gophers, and pronghorn antelopes. These mammals had their origin in western North America and have remained there to this day. The Asian counterparts are the carnivores known as civets and jerboas. Burt believes that, since these animals all inhabit semiarid areas, the land connection that existed between the two continents was probably not sufficiently arid for a long enough period of time to attract them.

A. D. Hasler, T. Schreiner, and W. Braemer (University of Wisconsin) have trained fish to find food and a hiding place in a given compass direction irrespective of the position of the sun in its path across the sky. Fish tagged at their spawning ground and released 2 miles away returned to the spawning sites in less than 24 hours in spite of the high turbidity of the water and their inability to see the shore or the bottom. On cloudy days, however, the displaced fish distributed themselves irregularly. If the fish were blinded with eye caps, their movements were slowed down and they drifted aimlessly with the currents. In the laboratory the fish were found to orient themselves to an artificial sun.

It has been observed many times that alfalfa does not establish itself on newly plowed sod infested with quack grass. Attempting to solve this dilemma, T. Kommedahl, A. J. Linck, and J. V. Bernardini (University of Minnesota) used ground rhizomes of quack grass that had been dried, sterilized to kill microorganisms, and then mixed with soil. Alfalfa grown in such mixtures was stunted and often yellow. Top growth was 65 percent less than that of alfalfa grown in pots with ordinary soil. Water extracts from rhizomes were also tested, and the result was a 60 percent reduction in top growth. Indications are that the quack grass produces a toxic substance or substances not yet identified.

Contradicting in part commonly held beliefs that life span depends on metabolism, G. A. Sacher (Argonne National Laboratory) offered evidence of a relationship between brain weight and maximum life span. Sacher suggested that if two species of animals differ in their ability to regulate, other things being equal, the species with the better regulation should have the greater life span. This would tend to account for man's longer length of life, for man should have better regulatory mechanisms than most lower animals have. Basing his considerations on the fact that the complexity and precision of regulatory mechanisms would be reflected in the sheer size or weight of the brain, Sacher used brain weight to measure indirectly the ability to regulate. His expectations have been confirmed for 60 species of mammals tested to date.

S. Zamenhof, R. de Giovanni, and S. Greer (Columbia University), working with sewage bacteria, substituted artificially prepared 5-bromouracil for thymine. The man-made molecule was incorporated into the bacteria's deoxyribonucleic acid, the basic substance of genes. As much as one-half of the bacteria's thymine was replaced by the 5-bromouracil. The bacteria with "bogus" genes differed in many ways from the original strain. Some were dwarfs, others giants, and many had lost their ability to manufacture certain essential enzymes. Even when all the 5-bromouracil was withdrawn from the media, some of the organisms retained the grotesque characteristics. In some experiments three or more of every 100 cells mutated. Some of the mutants have now persisted through 180 generations in the absence of 5-bromouracil and can be regarded as stable mutant strains.

These experiments may offer an explanation for the facts that some infectious bacteria survive antibiotics and some cancer cells resist anticancer drugs.

In the very few years since gibberellic acid was discovered, a large body of literature has accumulated. Several scores of papers on this subject were presented during the Stanford meetings. B. O. Phinney, one of the pioneers in the work, and P. M. Neely reported on the use of the mutant dwarf-1 of maize as a quantitative bioassay for gibberellin activity. The amount of response in the dwarf corn is in relation to the amount of material added. This response is specific to gibberellic acid and similar compounds. No other known plant growth regulators produce such response. The assay is quite sensitive, amounts down to 0.0001 microgram per plant being detectible. The assay has been used to estimate the difference in activity between gibberellic acid and gibberellin A, to determine the movement of gibberellins in plant tissues, and to determine the amounts of gibberellinlike substances produced by flowering plants.

L. V. Barton and J. M. Fine (Boyce Thompson Institute for Plant Research) reported on the spreading use of gibberellic acid in combination with pesticides. No interference seems to take place. The use of gibberellic acid in commercial potato production was discussed by L. Rappaport, H. Timm, and L. Lippert (University of California, Davis). A 5-minute bath in a gibberellin solution breaks the usual rest period of potatoes and brings on sprouting one to two weeks early. Recent experiments have shown that application of gibberellin sprays to plant foliage as long as seven weeks before harvest can also break the dormancy.

C. Chandler (Boyce Thompson Institute for Plant Research) discussed the use of gibberellic acid in pollen germination and the effect on pollen-tube growth. Production of desirable hybrids is often impossible because of the failure of pollen to germinate or grow fast enough to effect fertilization before the flowers drop. The percentage of germination of some plants tested was increased two to three times. Pollen-tube length was increased one to five times with the use of gibberellic acid. However, not all plants responded to gibberellic acid, and it is suggested that individual species be tested before application.

Blood-grouping studies in cattle have been under way since 1940, and in that short period of time more has been learned about these groups than for any other species, including man. W. J. Miller and C. Stormont (University of California, Davis) reported on parentage exclusion by blood-grouping studies in cattle. A dozen different systems of blood groups have been discovered, and it is calculated that over 400 billion blood types are possible in cattle. Ninety-five percent of all parentage problem testing done in the laboratory at Davis has been successful. In other words, a positive answer can be given in 19 of 20 cases when it is necessary to decide which of two bulls is qualified as the sire of a given calf.

The ergot alkaloids produced by the fungus *Claviceps purpurea,* used in childbirth and in the treatment of migraine headaches, are at the present time produced only in Europe. Only two laboratories have been successful in growing the fungus in liquid culture media, and they are located overseas. W. A. Taber and L. C. Vining (National Research Council of Canada, Saskatoon) have now reported on a method for the production of the alkaloids. Only certain strains of the fungus were found capable of synthesizing the alkaloids under laboratory conditions, and certain sugars and nitrogen compounds were found necessary for growth. Unexpectedly, illumination was found to increase alkaloid production significantly.

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Comparative Endocrinology

A symposium on Comparative Endocrinology, sponsored by Columbia University, has been scheduled for the period 26–29 May at Cold Spring Harbor, N.Y. Because of the limited housing accommodations, advance registration is recommended. For information concerning the program write to: Symposium on Comparative Endocrinology, Department of Zoology, Columbia University, New York 27, N.Y.

Pulmonary Circulation

The Chicago Heart Association is sponsoring a conference on pulmonary circulation that is to be held 20–22 March at the Palmer House. Introductory sessions will be devoted to the physiology, anatomy, and pathology of pulmonary circulation, with special emphasis on methods of clinical study. Later sessions will cover pulmonary circulation in congenital heart disease, primary lung disease, and acquired heart disease.

Among the visitors who are accepting major responsibility in the planning and execution of the conference are Julius Comroe of the University of Pennsylvania Graduate School of Medicine; Howard Burchell and Jesse Edwards of the Mayo Clinic, Rochester, Minn.; Paul Wood, from the Institute of Cardiology, London; and Lars Werko of Goteborgs Universitet, Gothenburg, Sweden. For information, write to Dr. Wright Adams, Chicago Heart Association, 69 W. Washington St., Chicago 2, Ill.

Forthcoming Events

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.)

9–14. International College of Surgeons, 11th biennial cong., Los Angeles, Calif. (K. A. Meyer, 1516 Lake Shore Dr., Chicago 10, Ill.)

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 Science 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, Northwestern Univ. Dental School, 311 E. Chicago Ave., Chicago, Ill.)

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 an-

nual, 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. American Physical Soc., Chicago, Ill. (E. R. Fitzgerald, Dept. of Physics, Pennsylvania State Univ., University Park.)

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, Washington, D.C. (S. S. Ballard, Scripps Institution of Oceanography, San Diego 52, Calif.)

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. Microcirculatory Conf., 5th, Buffalo, N.Y. (S. R. M. Reynolds, Dept. of Anatomy, Univ. of Illinois College of Medicine, 1853 W. Polk St., Chicago 12.)

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.)

3–5. Pennsylvania Acad. of Science, annual, Easton, Pa. (G. R. Stevens, Dept. of Geology and Geography, Lafayette College, Easton.)

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.

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 Ave., 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.)

(*See issue of 17 January for comprehensive list*)