Scientific Meetings

Mutation

The Brookhaven Symposium on Mutation, held at the Brookhaven National Laboratory in June 1955, attracted 335 participants apart from laboratory staff and included scientists from 17 countries in addition to the United States. A high level of interest, manifested by lively discussion following each of the 16 papers presented, was sustained over the 3-day period of the symposium. Such interest is a tribute to the continuing fertility of an area of genetics that has been vigorously exploited at least since 1927, when H. J. Muller reported the successful induction of mutations by x-irradiation. Fittingly, Muller delivered a major address to the symposium, conveying at once a sense of the significance of the mutation field in biology, of the refinement of technique that has gone into its study, and of the multiplicity of results that have been obtained. A few generalities emerging from the symposium seem noteworthy here.

S. Benzer presented evidence that certain of the recombination units in bacteriophage may be no larger than approximately a dozen nucleotide pairs. Whether the "recombination" that delineates these units in phage is the same process that has permitted the establishment of the classical chromosome maps is not clear. In any event, the observations are highly suggestive in relation to Benzer's finding that mutations may involve various "lengths" of the linearly arranged genetic material of phage and open the way to refined analysis of the functional and spatial organization of this genetic material.

The contribution of M. and Z. Demerec based on studies of transduction in *Salmonella* appears to have the same general implications as Benzer's work. In addition it gives examples of linearly arranged genetic units whose spatial sequence corresponds to functional sequences, functions being defined by various steps in a chain of biochemical reactions controlled by these units. That mutation frequencies themselves may be utilized in the precise definition and analysis of genetic material was reemphasized by N. H. Giles, who has focussed attention on forward and back mutation at particular loci, including apparent pseudoallelic clusters, in *Neurospora*. Work reported by W. L. Russell indicates that even such a relatively difficult genetic object as the mouse may be subjected to meaningful scrutiny in much the same way.

The studies mentioned in the preceding paragraphs relate fundamentally to the organization of genetic material in cells and have to do with the conceptual basis of genetics. From the time of Mendel, genetics has been one of the particulate sciences, and the characteristic methods of genetics have been the methods of a particulate science. The particles dealt with by the geneticist, at least on the main track of his science to the present, are genes linearly arranged in chromosomal material. Although present information, as represented in several of the symposium papers, in no way denies a particulate or discontinuous nature of hereditary materials, genetic particles as delineated variously by mutation, by chemical function, or by recombination are no longer readily seen as being unitary. If mutation studies were of interest for no other reason, they would at least be of enormous importance in elucidating the basic structure of the germ plasm.

An important fraction of the papers at the symposium dealt with various conditions that affect mutation frequency. The number and variety of conditions known to be effective in this way is impressively large already, and the possibilities have only begun to be sampled. Indicating the scope of present knowledge were reports on the oxygen effect on mutation, on the antimutagenic action of certain pyrimidine and purine ribosides, and on the correlation of differences in mutation frequency with differences in sex. In addition, W. S. Stone summarized the now well-known observations that ultraviolet light induces mutations in bacteria, not only when it is directed against cells themselves, but also when it is directed against media into which cells are later inoculated. Even though these observations seem best interpreted on the basis that the effect of ultraviolet light on medium is to produce chemical mutagens, which act upon the bacteria, these observations also reinforce the growing concept that the physiological state of the organism is highly important for the mutation process. It is possible that simple models for the direct action of mutagens on genetic material are inadequate and that the repair processes involving disrupted genetic material have a biological significance that has scarcely been realized. In an age when human populations have been exposed to increasing dosages of mutagens, and when both the dosages and the numbers of individuals involved may become still larger, the mechanism of induction of mutation and the factors that affect it become matters of vital importance.

It is worthy of brief comment that slightly more than half the papers given at the symposium were based on work falling within the broad area of microbial genetics. Doubtless a primary reason for this emphasis is that many kinds of mutations, even when elicited as effectively as possible by an inducing agent, are rare events. Techniques developed with microorganisms have enabled the screening of huge populations for the appearance of mutations. No less attractive, experimentally, are the readier avenues to chemical description of mutational processes, especially in the viruses. Nevertheless, the more classical organisms of genetics, notably *Drosophila* and maize, will continue to provide much fundamental information about mutation and the nature of genes. The precise identification and control of genetic units, largely referable to some decades of careful chromosome mapping in *Drosophila* and maize, and to the detailed cytological study of these favorable objects, permit an elegance of technique of certain kinds that is still far from possible in the best known of microorganisms. Many examples emerged in Muller's analysis of the relationship between chromosome changes and gene mutations. The advantages of closely cataloged germ plasm were particularly apparent in B. McClintock's demonstration of activator, dissociator, and modulator systems in maize, a demonstration that appears to discriminate between mutability and the perhaps equally important phenomenon of intranuclear control of gene action by mechanisms other than mutation.

No critical evaluation of the various papers, or even brief summaries or mention of all of them, is possible here. The symposium papers themselves and transcriptions of their formal discussion are being published by Brookhaven National Laboratory as *Brookhaven Symposia in Biology,* volume 8. The volume will contain about 250 pages and will be obtainable at a cost of $1.25 from the Office of Technical Services, Department of Commerce, Washington, D.C., after 1 Feb. 1956.

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Meeting Notes

■ The 15th annual Frontiers in Chemistry lectures, an activity of the department of chemistry of Western Reserve University, will present ten leading scientists on consecutive Fridays from 17 Feb. through 20 Apr. There are two major topics, "Application of instruments to analysis and molecular structure" and "Chemistry of organometallic and chelate compounds."

For each topic there are five lecturers. They are P. Debye of Cornell University, Robert W. Parry of the University of Michigan, P. W. Selwood of Northwestern University, A. H. Corwin of Johns Hopkins University, H. S. Gutowsky of the University of Illinois, A. E. Martell of Clark University, Paul Delahay of Louisiana State University, Avery A. Morton of Massachusetts Institute of Technology, Walter Gordy of Duke University, and John C. Bailar, Jr., of the University of Illinois.

■ The American Association of Spectrographers is planning its seventh annual conference in Chicago, Ill., 4 May, on the subject "New developments and techniques in spectroscopy." Contributed papers in the fields of emission, x-ray fluorescence, or absorption spectroscopy are invited. Abstracts *must be submitted by 16 Mar.* Address all inquiries to John P. Merutka, H. M. Harper Company, 8200 Lehigh Ave., Morton Grove, Ill.

■ The 16th annual general meeting of the Indian Society of Genetics and Plant Breeding was held at New Delhi on 12 Dec. 1955 under the presidency of T. R. Mehta, joint director of research, Madhya Bharat College of Agriculture and Research Institute, Gwalior. Mehta delivered an address entitled "The genotype in agriculture." The society decided to organize a symposium during 1956 on "The role of genetics in the improvement of tropical crop plants"; a subcommittee under the chairmanship of B. P. Pal was appointed for this purpose.

■ The following visitors from abroad were among those who participated in the International Conference on Fatigue in Aircraft Structures, which was held at Columbia University 30 Jan.–1 Feb.

England: P. J. E. Forsyth and R. J. Atkinson of the Royal Aircraft Establishment, Farnborough; N. Thompson of the H. H. Wills Physical Laboratory, Bristol; R. F. Hanstock of High Duty Alloys, Ltd., Slough; H. Giddings of the Bristol Aeroplane Co., Ltd., Bristol.

Scotland: C. E. Phillips of the Mechanical Engineering Research Laboratory, East Kilbrid.

Australia: W. A. Wood of the metal research department, University of Melbourne.

Germany: M. Hempel of the Max Planck Institute for Steel Research, Dusseldorf; E. Gassner, Laboratory for Performance Testing, Darmstadt.

Sweden: W. Weibull of Stockholm; Bo Lundberg of the Aeronautical Research Institute of Sweden, Stockholm; F. Turner of SAAB Aircraft Co., Linkoping.

The conference was jointly sponsored by Columbia University's Department of Civil Engineering and Engineering Mechanics, its Institute of Flight Structures, and the Office of Scientific Research and Development of the U.S. Air Force. Alfred M. Freudenthal, professor of civil engineering at Columbia, was chairman of the organizing committee for the meeting.

■ The American Association of Physical Anthropologists will celebrate its 25th anniversary when it meets at the University of Chicago 6–8 Apr. In addition to the anniversary celebration, which will be held during the annual dinner, special features include a symposium on "Early man in Africa," organized by Sherwood L. Washburn, and a panel discussion on problems in human identification that will be led by Russell Newman.

■ A European Symposium on Vitamin B_{12} and Intrinsic Factor will take place under the sponsorship of Prof. J. Kuhnau, Physiologisch Chemisches Institut der Universitat Hamburg (Germany), 23–26 May. For further information, address the secretary of the symposium, Dr. H. C. Heinrich.

■ The Primer Congreso Panamericano de Gerontologia will be held in Mexico, D.F., under the presidency of Manuel Payno, 7–15 Sept. Payno is the president of the Academia Mexicana de Gerontologia and the Sociedad Mexicana de Geriatria. His address is Ave. Cuauhtemoc No. 10-3, Mexico 7, D.F. J. H. Sheldon, president of the International Association of Gerontology, has agreed to serve as an honorary president.

Those desiring to present papers should send abstracts of not more than 200 words to E. V. Cowdry, Washington University School of Medicine, St. Louis 10, Mo., *before 1 Apr.* Please mention whether or not lantern slides are to be shown.

Society Elections

■ Indian Society of Genetics and Plant Breeding: pres., V. M. Chavan, Poona; sec., M. S. Swaminathan, New Delhi; treas., N. L. Dhawan, Division of Botany, Indian Agricultural Research Institute, New Delhi. The vice presidents are P. N. Bhaduri, New Delhi, and G. S. Murty, New Delhi.

■ International Institute of Embryology: pres., M. W. Woerdeman; sec.-treas., Chr. P. Raven. The vice presidents are E. Fauré-Fremiet, F. E. Lehmann, and Paul Weiss.

■ American Eugenics Society: pres., Harry L. Shapiro; v. pres., Alan F. Guttmacher; sec., Frederick Osborn, AES, 230 Park Ave., New York 17; treas., Chauncey Belknap.

■ National Association of Biology Teachers: pres., John P. Harrold, 110 E. Hines St., Midland, Mich.; pres.-elect, John Breukelman, State Teachers College, Emporia, Kan.; past pres., Brother Charles, St. Mary's College, Winona, Minn.; sec.-treas., Paul V. Webster, Bryan City Schools, Bryan, Ohio. The vice presidents are Irene Hollenbeck, Howard E. Weaver, and Robert L. Smith.

■ European Organization for Nuclear Research (CERN): pres., Sir Ben Lockspeiser (United Kingdom); v. presidents, M. Jacques de Bourbon-Busset (France) and Prof. Ivar Waller (Sweden); chairman of the Finance Committee, M. Jean Willems (Belgium); additional members of the Committee of Council, Dr. Antonio Pennetta (Italy) and Prof. Paul Scherrer (Switzerland).

■ Western Society of Naturalists: pres., Albert Tyler, California Institute of Technology; v. pres., William M. Hiesey, Carnegie Institution of Washington, Division of Plant Pathology, Stanford, Calif.; sec., Demorest Davenport, Santa Barbara College, University of California; treas., Marion Ownbey Washington State College.

■ American Society for the Study of Arteriosclerosis: pres., Arthur C. Corcoran, Cleveland Clinic, Cleveland, Ohio; past pres., L. N. Katz; v. pres., Charles F. Wilkinson, Jr., New York; sec.-treas., O. J. Pollak, P.O. Box 228, Dover, Del.

Forthcoming Events

March

8. Assoc. of Vitamin Chemists, Chicago, Ill. (M. Freed, Dawes Products, 4800 S. Richmond, Chicago 32, Ill.)

9–10. **Midwest Conf. on Theoretical Physics, Iowa City, Iowa. (J. M. Jauch, Dept. of Physics, State Univ. of Iowa, Iowa City.)**

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.)

17–18. National Soc. of Professional Engineers, annual spring, Washington, D.C. (K. E. Trombley, NSPE, 1121 15 St., NW, Washington 5.)

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.)

19–21. Div. of Fluid Dynamics, American Physical Soc., Pasadena, Calif. (F. N. Frenkiel, Applied Physics Lab., Johns Hopkins Univ., Silver Spring, Md.)

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 Institute of Technology, Chicago 16.)

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

22–24. Michigan Acad. of Science, Arts and Letters, annual, Ann Arbor. (G. M. McEwen, 5 East Hall, Univ. of Michigan, Ann Arbor.)

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

23–24. North Carolina Acad. of Science, annual, Chapel Hill. (J. A. Yarbrough, Meredith College, Raleigh.)

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

24–31. Perspectives in Marine Biology, La Jolla, Calif. (A. A. Buzzati-Traverso, Scripps Institution of Oceanography, La Jolla.)

25–28. American Assoc. of Dental Schools, annual, St. Louis, Mo. (M. W. McCrea, 42 S. Greene St., Baltimore 1, Md.)

25–29. American College Personnel Assoc., Washington, D.C. (Miss C. M. Northrup, Univ. of Denver, Denver, Colo.)

28–3. Colloquium on Frontiers in Physical Optics, Boston, Mass. (S. S. Ballard, Visibility Laboratory, Scripps Institution of Oceanography, San Diego 52, Calif.)

29–31. Pennsylvania Acad. of Science, Indiana. (K. Dearolf, Public Museum and Art Gallery, Reading, Pa.)

29–31. Southern Soc. for Philosophy and Psychology, Asheville, N.C. (J. E. Moore, Georgia Inst. of Technology, Atlanta.)

29–31. Symposium on Fundamental Cancer Research, 10th annual, Houston, Tex. (G. Taylor, Univ. of Texas Postgraduate School of Medicine, Houston 25.)

30–31. Alabama Acad. of Science, annual, Montevallo. (H. A. McCullough, Howard College, Birmingham, Ala.)

April

2–5. Assoc. of American Geographers, annual, Montreal, Canada. (B. W. Adkinson, Library of Congress, Washington 25.)

2–7. Symposium on Crystallography, Madrid, Spain. (M. Abbad, Serrano 118, Madrid.)

3. Microcirculatory Conf., 3rd, Milwaukee, Wis. (G. P. Fulton, Dept. of Biology, Boston Univ., 675 Commonwealth Ave., Boston 15, Mass.)

(See issue of 20 January for comprehensive list)