Meetings

Cellular Dynamics: The Cell Cycle

The chemistry of the cell cycle, the structure of the cell during mitosis, and the mechanism of mitosis were discussed at the 3rd Conference on Cellular Dynamics (Princeton, N.J., 7–10 February). This meeting, like others in the series, was designed to provide extended discussion in a particular area with emphasis on the definition of unsolved problems and the possible directions of future research rather than on the presentation of reports of current work.

The first session, led by S. Gelfant (University of Syracuse) and E. W. Taylor (University of Chicago), was concerned with synthesis of macromolecules and energy requirements for mitosis. The concept, originated by Swann, of an energy reservoir for mitosis was subjected to sharp criticism. The available evidence supports neither the need for a large amount of energy for mitosis nor the presence of specific pools of energy-yielding compounds which are segregated for use during mitosis. However, carbon monoxide blocks mitosis in sea-urchin eggs (Epel) when the concentration of adenosine triphosphate is less than 50 percent of the normal concentration. Presumably phosphagens are involved in the process, but their presence may be related to other mechanisms besides the mechanical-energy requirement.

The question of DNA replication and the asynchrony in labeling of chromosome segments during the synthetic period of interphase (S stage) was discussed by J. H. Taylor (Florida) and Prokofieva-Belgovskaya (Moscow). Statistical analysis of grain distribution over chromosome segments in radioautographs clearly showed a time sequence in duplication of different regions of the chromosome in human leukocytes (Prokofieva-Belgovskaya). Taylor emphasized the significance of asynchrony with respect to control of DNA duplication. It was suggested that chromosomes probably contain many regions that replicate as a unit ("a replicon") and which are controlled by specific genes.

Our almost complete ignorance of the timing of synthesis of enzymes and structural proteins such as those of the mitotic apparatus was emphasized. The relation of the control of protein synthesis in the cell cycle to the shutting off of the synthesis of several proteins during cellular differentiation was discussed by H. Holtzer (University of Pennsylvania). It was decided that this field is of great importance for future study and that concepts of repression derived from bacterial systems may not be sufficient to explain the inactivation of large blocks of genes.

A discussion of use of specific protein stains and ultraviolet fluorescence microscopy for the study of growth during the cell cycle was presented by Zelenin (Moscow).

The occurrence of fibrous structures and their relation to the mitotic spindle were discussed by L. E. Roth (Iowa), and a survey of the occurrence and structure of microtubules was presented by M. C. Ledbetter (Harvard). It is increasingly evident that the microtubule structures in the spindle can be correlated with structures associated with streaming in plants and possibly even with paired filaments in cilia and flagella.

A discussion of the general features of mitotic movements in relation to other motile systems (streaming, cilia and flagella, saltatory movements) was introduced by Wolpert (King's College, London). A general feeling arising from the dicussion was the need for a unified approach to problems of motility. The similarity in chemical properties of the proteins of the mitotic spindle, cilium, and slime mold was discussed by Gibbons (Harvard) and Rebhun (Princeton). The question was also raised as to whether all motile systems contain at least two protein components.

The mechanism of chromosome movements remains obscure. Although it was felt that theories which do not take account of the fibrous structure of the spindle can be safely abandoned, four or five mechanisms still remain which could explain the observations. The simple picture of elastic filaments no longer seems adequate, and the chromosome movements obtained after microbeam irradiation (Forer and Inoué) can hardly be explained by a one-component elastic mechanism.

The structure of the plasma membrane, the role of membrane formation, and changes in rigidity during cleavage formed part of a general discussion (Benedetti, Amsterdam; Selman, Edinburgh; Zimmerman, Toronto). A single mechanism of cleavage applicable to various types of eggs (frog and sea-urchin) and somatic cells cannot be agreed upon at present.

The conference, held under the auspices of the Interdisciplinary Communications Program of the New York Academy of Sciences, was supported by the Office of Naval Research and the National Aeronautics and Space Administration. Edwin W. Taylor was chairman.

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Forthcoming Events

June

12–20. National **Speleological** Soc., annual conv., Bloomington, Ind. (D. R. Martin, 2711 Oak St., Terre Haute, Ind.)

13. Society for **Surgery of the Alimentary Tract**, New York, N.Y. (R. Turell, 25 E. 83 St., New York)

13–15. **Medicine and Religion**, 1st natl. symp., Estes Park, Colo. (Office of Postgraduate Medical Education, Univ. of Colorado Medical Center, 4200 Ninth Ave., Denver 80220)

13–17. American Inst. of **Chemical Engineers**/Institution of Chemical Engineers, joint meeting, London, England. (F. J. Van Antwerpen, American Inst. of Chemical Engineers, 345 E. 47 St., New York, N.Y. 10017)

13–18. American Soc. for **Testing and Materials**, 68th annual, Purdue Univ., Lafayette, Ind. (ASTM, 1916 Race St., Philadelphia, Pa. 19103)

14–16. Cooper **Ornithological** Soc., Univ. of British Columbia, Vancouver, Canada.

(J. Davis, Hastings Reservation, Carmel Valley, Calif.)

14–16. **Cost-Effectiveness Techniques**, 1st natl. symp., Washington, D.C. (D. E. van Tyn, 1700 K St., NW, Washington, D.C.)

14–16. American **Neurological** Assoc., 19th annual, Atlantic City, N.J. (M. D. Yahr, 710 W. 168 St., New York 10032)

14–16. **Oral Biology**, 3rd intern. conf., London, England. (Conference Secretary, Dept. of Dental Science, Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.2)

14–17. **Health Physics** Soc., Los Angeles, Calif. (W. S. Snyder, Health Physics Div., Oak Ridge Natl. Laboratories, Oak Ridge, Tenn.)

14–17. **Ocean Science and Ocean Engineering**, natl. conf., Washington, D.C. (Marine Technology Soc., 1030 15th St., NW, Washington, D.C. 20005)

14–17. American **Proctologic** Soc., annual, Minneapolis, Minn. (N. D. Nigro, 320 West Lafayette, Detroit, Mich. 48226)

14–17. **Spectroscopy**, annual Mid-America symp., Chicago, Ill. (L. R. Pearson, American Can Co., Research Center, Barrington, Ill.)

14–18. Basic Environmental Problems of **Man in Space**, symp., Paris, France. (Intern. Acad. of Astronautics, Intern. Astronautical Federation, 250 rue St. Jacques, Paris 5e)

14–18. Canadian **Medical** Assoc., annual, Halifax, N.S. (A. D. Kelly, 150 St. George St., Toronto 5, Ont.)

14–18. **Molecular Structure and Spectroscopy**, annual symp., Columbus, Ohio. (K. N. Rao, Dept. of Physics and Astronomy, 174 W. 18 Ave., Columbus 43210)

14–18. **Vacuum Metallurgy**, intern. conf., Brussels, Belgium. (R. Winand, Service du Prof. Decroly, Metallurgie-Electrochimie, Universite Libre de Bruxelles, 50 avenue F. D. Roosevelt, Brussels 5)

14–18. **Propulsion** Conf., Colorado Springs, Colo. (C. Builder, Aerospace Corp., 2400 E. El Segundo Blvd., El Segundo, Calif.)

14–18. Association of **Official Seed Analysts**, annual, Lexington, Ky. (M. V. Maddows, Florida State Seed Laboratory, 406 Nathan Mayo Bldg., Tallahassee)

14–19. **Differential Geometry**, U.S.–Japan Cooperative Science Program seminar, Kyoto, Japan (invitation only). (Office of Intern. Science Activities, Natl. Science Foundation, Washington, D.C.)

14–19. **Multivariate Analysis**, intern. symp., Univ. of Dayton, Ohio. (P. R. Krishnaiah, Aerospace Research Laboratories, Wright-Patterson Air Force Base, Ohio)

14–23. Statistical Techniques in **Quality Control**, 22nd annual, Rochester Inst. of Technology, Rochester, N.Y. (J. H. Swanton, Extended Services Div., Rochester Inst. of Technology, Rochester, 14608)

15–18. **Biophysics and Physiology of Biological Transport**, symp., Rome, Italy. (L. Bolis, Via Alamanni 19, Milan, Italy)

15–18. American Soc. of **Pharmacognosy**, 6th annual, Kingston, R.I. (L. R. Worthen, College of Pharmacy, Univ. of Rhode Island, Kingston)

15–19. European **Orthodontic** Soc., 41st congr., Stockholm, Sweden. (D. P. Walther, Royal Dental Hospital, 32 Leicester Sq., London, W.C.2, England)

15–22. Design of **Hydrometeorological Works**, intern. symp., Quebec, Canada. (World Meteorological Organization, 41, avenue Giuseppe Motta, Geneva, Switzerland)

16. American **Cancer** Soc., scientific session, Philadelphia, Pa. (Director, Professional Education, ACS, 219 E. 42 St., New York 10017)

16–18. **Water Chemistry**, applications and principles, 4th research conf., Rutgers Univ., New Brunswick, N.J. (Office of Resident Instruction, College of Agriculture, Rutgers Univ., New Brunswick 08903)

16–19. Society of **Nuclear Medicine**, 12th annual, Bal Harbour, Fla. (S. N. Turiel, 333 North Michigan Ave., Chicago, Ill.)

16–19. International College of **Surgeons**, European Federation, congr., Helsinki, Finland. (P. Vara, Haartmaninkatu 2 A, Helsinki)

16–20. American Soc. of **Ichthyologists and Herpetologists**, annual, Lawrence, Kan. (W. Duellman, Museum of Natural History, Univ. of Kansas, Lawrence)

16–24. International Council of **Nurses**, 13th congr., Frankfurt am Main, Germany. (German Nurses' Federation, Cronstettenstr. 25, Frankfurt am Main)

17–18. **Biomedical Lasers**, 1st annual conf., Boston, Mass. (P. E. McGuff, Director, Laser Medical Research Foundation, 91 Brighton Ave., Boston 02134)

17–18. **Computer Personnel Research Group**, 3rd annual conf., Washington Univ., St. Louis, Mo. (M. H. Gotterer, 120 Boucke Bldg., Pennsylvania State Univ., University Park 16802)

17–18. American **Rheumatism** Assoc., annual, Philadelphia, Pa. (ARA, 10 Columbus Circle, New York, N.Y. 10019)

17–19. International Assoc. for the Study of the **Bronchi**, 15th congr., Oporto, Portugal. (E. Pinto, Estrada da Circumvalaçao 10039, Oporto)

17–19. **Endocrine** Soc., New York, N.Y. (H. H. Tucker, 1200 North Walker, Oklahoma City, Okla.)

17–19. **Pediatrics**, 13th congr., Prague, Czechoslovakia. (J. Houstek, Sokolska 2, Prague 2)

17–19. American Assoc. of **Physics Teachers**, summer meeting, Knoxville, Tenn. (M. Phillips, Physics Dept., Univ. of Chicago, Chicago, Ill.)

17–19. **Steroid Hormones**, 2nd symp., Ghent, Belgium. (A. Vermeulen, Dept. of Endocrinology and Metabolism, Medical Clinic, Akademisch Ziekenhuis, Ghent)

17–20. American College of **Angiology**, New York, N.Y. (A. Halpern, 50 Broadway, New York)

17–20. Wilson **Ornithological** Soc., Black Hills, S.D. (P. B. Hofslund, Biology Dept., Univ. of Minnesota, Duluth 55812)

17–21. American College of **Cardiology**, Boston, Mass. (P. Reighert, Empire State Bldg., 350 Fifth Ave., New York 10001)

17–21. American College of **Chest Physicians**, New York, N.Y. (M. Kornfeld, 112 E. Chestnut, Chicago 11, Ill.)

18–19. American Soc. of Certified **Engineering Technicians**, 1st annual, Milwaukee, Wis. (ASCET, 2029 K St., NW, Washington, D.C. 20006)

19. Academy of **Tuberculosis Physicians**, New York, N.Y. (G. P. Bailey, 1295 Clermont, Denver 20, Colo.)

20. Society of **Vascular Surgery**, annual, New York, N.Y. (W. S. Edwards, Dept. of Surgery, Medical College of Alabama, Birmingham)

20–22. Society for **Investigative Dermatology**, 26th annual, New York, N.Y. (H. Beerman, 255 S. 17 St., Philadelphia, Pa. 19103)

20–23. American Soc. of **Agricultural Engineers**, 58th annual, Univ. of Georgia, Athens. (J. L. Butt, P.O. Box 229, St. Joseph, Mich.)

20–24. American Soc. of **Mammalogists**, Winnipeg, Manitoba, Canada. (B. P. Glass, Dept. of Zoology, Oklahoma State Univ., Stillwater 74075)

20–24. American Soc. of **Medical Technologists**, Cincinnati, Ohio. (R. Matthaei, Suite 25, Hermann Professional Bldg., Houston, Tex. 77025)

20–24. American **Nuclear** Soc., 11th natl., Gatlinburg, Tenn. (ANS, 244 East Ogden Ave., Hinsdale, Ill.)

20–24. **Air Pollution Control** Assoc., 58th annual, Toronto, Ont., Canada. (M. Katz, Dept. of Natl. Health and Welfare, 45 Spencer St., Ottawa, Ont.)

20–24. **Aerospace**, conf., Houston, Tex. (T. B. Owen, Douglas Aircraft Co., 300 Ocean Park Blvd., Dept. A2-260, Santa Monica, Calif.)

20–25. American **Physical Therapy** Assoc., Cleveland, Ohio. (L. Blair, 1790 Broadway, New York 10019)

20–25. **Weights and Measures**, natl. conf., Washington, D.C. (M. W. Jensen, Office of Weights and Measures, 203–213, Natl. Bureau of Standards, Washington, D.C. 20234)

21–22. **Genetic Selection and Infectious Diseases**, London, England. (Ciba Foundation, 41 Portland Pl., London, W.1)

21–22. **Vacuum Metallurgy** Div., American Vacuum Soc., 8th annual conf., New York, N.Y. (L. M. Bianchi, Refractomet Div., Universal-Cyclops Steel Corp., Bridgeville, Pa.)

21–23. Society for the Study of **Development and Growth**, annual, Carleton College, Northfield, Minn. (J. A. Schiff, Dept. of Biology, Brandeis Univ., Waltham, Mass.)

21–23. **Luminescence Dosimetry**, intern. conf., Stanford, Calif. (F. H. Attix, Code 7280, U.S. Naval Research Laboratory, Washington, D.C. 20390)

21–23. **Heat Tansfer and Fluid Mechanics**, inst., Univ. of California, Los Angeles. (A. F. Charwat, Dept. of Engineering, Univ. of California, Los Angeles 90024)

21–24. **Agricultural** Inst. of Canada, Vancouver, B.C. (AIC, Central Office, 176 Gloucester St., Ottawa 4, Ont.)

21–24. Canadian Soc. of **Animal Production**, annual, Vancouver, B.C. (J. A. Newman, CSAP, Experimental Farm, Lacombe, Alta.)

21–24. **Automatic Control in Peaceful Uses of Space**, intern. symp., Stavanger, Norway. (J. A. Aseltine, Aerospace Corp., P.O. Box 95085, Los Angeles, Calif.)

21–24. **Fuel Cells**, intern. symp., Brussels, Belgium. (Mr. Vanleugenhaghe, S.E.R.A.I., 1091, chaussee d'Alsemberg, Brussels 18)