physiology of mitochondria included discussion of the structure of mitochondria, enzymatic machinery, the calcium-transport system, the nature of deposited mineral, the calcium release system, and phosphate transport dependent on parathyroid hormone.

In the calcium and phosphate loading of mitochondria the ratio of calcium to phosphorus is 1.7. When the membrane of loaded mitochondria was removed it was found that the mineral was amorphous (noncrystalline). When calcium accumulates, the mitochondrion is no longer capable of doing work and respiration decreases. Although in mitochondria the flow of electrons in the respiratory chain is compulsively linked with the synthesis of adenosine triphosphate and with the energy of oxidative phosphorylation, a similar linkage among electron transport, generation of energy, and resorption of bone has not been shown. Mitochondria of osteoclasts accumulate this combination of calcium and inorganic phosphate; this accumulation is not specific for osteoclasts. As yet mitochondria cannot be directly implicated in calcification or resorption.

W. H. Boyce (Bowman Gray School of Medicine), reviewed mineralization from the standpoint of kidney-stone disease. Uromucoid, or substance A, was isolated from the urine of kidney-disease patients who do not form stones; the substance is not present in normal kidneys. John Eager Howard (Johns Hopkins University and Hospital) reviewed the work on inhibition of calcification. A proteinaceous matrix is present in kidney stones of all types; there are some similarities to bone and cartilage, as shown by histochemical studies of these matrices. Hypertrophic cartilage from rachitic rats will mineralize in vitro when provided with adequate concentrations of calcium and phosphate. Substances from serums of uremic patients, known to contain an inhibitor, will prevent mineralization of cartilage from rachitic rats. Urine from subjects with renal calculi will mineralize cartilage matrix from rachitic rats; the addition of metaphosphate prevents mineralization.

The last day of the conference was a recapitulation and a summing up of concepts. Participants were invited to present a wide variety of material, all bearing on the general theme of the conference. Discussion included: limitations of the applicability of physicochemical theories to biological situations; the application of the electrolyte theory to biological solutions; studies on the relationship between ion transport and the physicochemical state of ions in body cells and the extent of binding of ions by subcellular sites of structure; metabolic and structural bone; and material on cell populations, with a plea for an agreement on terminology.

Participants were encouraged to submit five questions or statements relating to unsolved problems covering topics of each major discussion. In retrospect, the conference, as an experiment of "conversation *en group*" was commendable in that no feature or topic by itself was abruptly concluded or dismissed; many of the problems and questions raised in earlier sessions were brought into the discussion during later periods. These unanswered questions and unproved theories may well be resolved in the future conferences of this series.

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. A transcript will be published before the second conference, to be held in 1966.

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Population Growth

The World Conference on Population, organized under the auspices of the United Nations and held in Belgrade, Yugoslavia, 30 August–10 September 1965, had as its objectives improvement of understanding of population problems, especially as they relate to problems of economic and social development; stimulation of interest in scientific research and in securing of data pertinent to these problems; and enhancement of the effectiveness of work in these fields.

Underlying all the discussions were the facts of the recent rapid growth of the world's population, especially in the developing countries. It was pointed out that there are at present no developed countries with gross reproduction rates above 2.0 and no developing countries with rates below 2.0. With declines in mortality and a maintenance of traditionally high levels of fertility, rates of population growth in the developing countries have recently increased and generally show no signs of abatement. Much attention was given to the implications of current rates of population growth for the process of economic and social development and to the processes by which birth rates, and thus rates of growth, might be reduced.

There were wide differences of opinion on the role of governments in reducing rates of growth. One view was that governments should take positive action to bring knowledge of methods of fertility limitation to the people, and should make available the means by which such control could be accomplished. Another view was that such action was not a proper function of governments and that the most effective course would be to promote economic and social development which would, in turn, lead to a reduction of fertility, as it had in the developed countries. Some participants expressed the view that there was no problem of excessive rates of growth in underdeveloped areas and that, therefore, no public or private action was needed.

Although food supplies have been increasing about as rapidly as population, there was concern over the fact that increases in food production had not kept pace with population growth in most of the developing countries. In general these countries were exporters of food supplies before the war, but have been importing an increasing amount of food in recent years. Even with these imports, diets in many parts of the world fail to provide adequate nutrition. Very large increases in food production, especially in the developing countries, are needed if the growing population is to be supplied with necessary food. It was felt that the resources for such increases are available and that the problem of securing needed increases is a problem of the ways in which the available resources are used and of the extent to which capital and modern scientific and technological developments are applied. In an opening address, the Director General of the United Nations Food and Agriculture Organization urged that side by side with a concerted effort to increase productivity of agriculture in the developing countries, population stabilization must be undertaken without further delay as a social policy of urgent priority.

With regard to natural resources generally, it was pointed out, on the one hand, that although the earth is

finite, the potential resources of the earth are so large when man's creativity is applied to them that it is meaningless to set arbitrary limits for future world population for an indefinite period. Alternatively, it was pointed out that the limits of production for many mineral resources are such that an annual world consumption 15 times larger than at present is quite impossible.

The course of future population growth received much attention. The United Nations has recently prepared new sets of projections which were evaluated in the discussion. It was pointed out that if current trends continue in the developing areas there will be relatively unchanging fertility along with continually declining mortality. If the decline in mortality occurs, increases in food production will have been sufficient to sustain the increasing numbers. Rapid economic growth is required to satisfy this condition. Demographic trends and trends of economic and social development cannot be viewed as independent factors. One statement pointed out that "economic and social development is essential to the solution of population problems; slowing rates of population growth in much of the world are essential to the solution of economic and social problems."

The world's population has grown by nearly one-fourth since the first World Population Conference was held in Rome in 1954. The number of participants and observers at this conference was about double that at the Rome conference. Reflecting the growing awareness of population trends in the developing countries, there was a substantial increase in the number of participants from Asia (2½ times as many), Africa (twice as many), and Latin America (almost twice as many).

In his closing address, the chairman of the conference, Dolfe Vogelnik (Yugoslavia), said that the conference had led to progress in the knowledge of demographic phenomena and to a narrowing of differences in points of view and that it had thus provided a better basis for discussion of these differences. He recognized that there are real differences in the conclusions drawn, partly due to misunderstanding, partly due to differences in economic and social conditions and to basic hypotheses and theoretical interpretations. He felt that confrontations of such differences are an essential condition to the promotion of scientific work, and that in this respect the conference had made a major contribution.

The conference was organized with the cooperation of the International Union for the Scientific Study of Population, the International Labor Organization, the Food and Agriculture Organization of the United Nations, the United Nations Educational, Scientific, and Cultural Organization, the World Health Organization, and the International Bank for Reconstruction and Development. The government of Yugoslavia served as host. Approximately 400 papers were presented in 25 sessions. The *Proceedings* will be published by the United Nations.

The conference elected six vice presidents: Thomas Curtis (Guinea), S. Somogyi (Italy), V. E. Ovsienko (U.S.S.R.), M. Tachi (Japan), Irene B. Taeuber (United States), and Victor Urquidi (Mexico).

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Forthcoming Events

January

20–22. **Symmetry Principles at High Energy**, conf., Univ. of Miami, Coral Gables, Fla. (D. R. Lehman, Air Force Office of Scientific Research, Tempo D, 4th and Independence Ave., SW, Washington, D.C.)

21–22. Physiology of **Hemostasis and Thrombosis**, 14th annual Wayne State Univ. symp. on blood, Detroit, Mich. (W. H. Seegers, Dept. of Physiology and Pharmacology, Wayne State Univ., Detroit)

22–27. American Acad. of **Orthopedic Surgeons**, Chicago, Ill. (J. K. Hart, 29 E. Madison, Chicago 2)

23–28. American **Library** Assoc., midwinter mtg., Chicago, Ill. (D. H. Clift, American Library Assoc., 50 E. Huron St., Chicago 60611)

24–26. **Aerospace Sciences**, 3rd mtg., American Inst. of Aeronautics and Astronautics, New York, N.Y. (AIAA, 1290 Sixth Ave., New York 10019)

24–26. **Economic Geology** in Massachusetts, conf., Amherst. (O. C. Farquhar, Geology Dept., Univ. of Massachusetts, Amherst 01003)

24–27. Modern Methods of **Analytical Chemistry**, 19th annual, Louisiana State Univ. symp., Baton Rouge. (P. W. West, LSU, Baton Rouge)

24–27. American Soc. of **Heating, Refrigerating, and Air-Conditioning Engineers**, semiannual mtg., Houston, Tex. (ASHRAE, 345 E. 47 St., New York)

24–27. American **Meteorological Soc.**, 46th annual mtg., Denver, Colo. (K. C. Spengler, AMS, 45 Beacon St., Boston, Mass.)

24–28. Animal and Clinical **Pharmacologic Techniques in Drug Evaluation**, part 1, mtg., Philadelphia, Pa. (J. H. Nodine, Hahnemann Medical College and Hospital, 230 N. Broad St., Philadelphia)

24–30. **CNS–Drugs**, symp., Regional Research Laboratory, Hyderabad, India. (P. B. Sattur, Regional Research Laboratory, Hyderabad 9)

25. Research and Industrial Applications of the **Mössbauer Effect**, New York, N.Y. (M. Ress, New England Nuclear Corp., 575 Albany St., Boston, Mass.)

25–27. **Reliability**, 12th annual symp., Inst. of Electrical and Electronics Engineers, San Francisco, Calif. (A. R. Park, General Precision Inc., 1378 Encinatas Rd., San Marcos, Calif.)

26. Current and Future Problems in **Chemistry at High Temperatures**, Rice Univ., Houston, Tex. (M. A. Paul, Div. of Chemistry and Chemical Technology, National Acad. of Sciences, Washington, D.C. 20418)

26–27. **Sulfur**, symp., Wilson Dam, Ala. (V. J. Kilmer, Div. of Agricultural Development, Tennessee Valley Authority, Wilson Dam 35661)

26–28. **Light Nuclei**, symp., Lyon, France. (R. Radvanyi, Lab. Joliot-Curie de physique nucléaire, Faculté des Sciences, B.P. 1, Orsay, France)

26–28. **Mathematical** Assoc. of America, 49th annual mtg., Chicago, Ill. (H. M. Gehman, State Univ. of New York, Buffalo 14214)

26–29. American **Physical** Soc., annual mtg., New York, N.Y. (K. K. Darrow, APS, 335 E. 45 St., New York 10017)

26–29. American Assoc. of **Physics Teachers**, annual mtg., New York, N.Y. (M. Phillips, Ryerson Physical Laboratory, Univ. of Chicago, Chicago, Ill. 60637)

27–29. American **Group Psychotherapy** Assoc., Philadelphia, Pa. (AGPA, 1790 Broadway, New York 10019)

27–29. International **Medical Assembly** of Southwest Texas, San Antonio. (S. E. Cockrell, Jr., 202 W. French Pl., San Antonio 78212)

28–4. **Medical Ethics**, seminar, London, England. (E. F. Shotter, Ciba Foundation, 41 Portland Pl., London, W.1)

28–29. **Proteins**, 21st conf., Rutgers Bureau of Biological Research, Rutgers Univ., New Brunswick, N.J. (R. L. Squibb, Rutgers Univ., New Brunswick)

30–4. Institute of **Electrical and Electronics Engineers, Power Group**, winter mtg., New York, N.Y. (E. C. Day, IEEE, 345 E. 47 St., New York 10017)

30–4. American Soc. for **Testing and Materials**, spring mtg., Washington, D.C. (T. A. Marshall, ASTM, 1916 Race St., Philadelphia 3, Pa.)

31–2. **Information Theory**, intern. symp., Inst. of Electrical and Electronics Engineers, Univ. of California, Los Angeles. (A. V. Balakrishnan, Dept. of Engineering, Univ. of California, Los Angeles 90024)

31–2. Solid Propellant **Rockets**, 7th conf. (American Inst. of Aeronautics and Astronautics, 1290 Sixth Ave., New York 10019)

31–3. Scientific Aspects of **Pest Control**, symp., Washington, D.C. (Agricultural Board, National Academy of Sciences, 2101 Constitution Ave., NW., Washington)