News and Notes

The Residues of Malnutrition and Starvation

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On June 1 and 2, 1950, specialists on nutritional, medical, and agricultural science assembled at the University of Minnesota Laboratory of Physiological Hygiene in a Conference on the Residues of Nutritional Insult. Attention was focused on the effects in man of periods of food shortage, semistarvation, and severe malnutrition, particularly as encountered in war and in natural catastrophe. As a result of the discussions and of consideration of the scientific evidence, it was decided to set forth the major items of agreement among the members of the conference. It was further agreed that, because of the importance and urgency of the questions involved, these points of agreement should be brought to the attention of various agencies and organizations which have, or should have, responsibility and concern in regard to these matters. The resulting statement represents the opinions of the members of the conference as individuals and not necessarily those of the organizations with which they are affiliated. Several persons who were unable to attend the conference but whose knowledge and experience give weight to their opinions on these questions were invited to examine this statement. Their agreement with it is signified by the addition of their names to those of the members subjoined to this statement.

There was agreement on the following points:

1. Even in times of comparative peace and prosperity man suffers from malnutrition, including semistarvation or actual starvation, as a result of disease, injury, individual poverty, nutritional ignorance, inequitable food distribution, and crop failure. These factors are aggravated in many parts of the world by population pressures that tend to exceed the food production.

2. Periods of war, great civil disorder, and economic or natural catastrophe are generally attended by food shortages, disruption of normal distribution of food, or outright famine. The resulting human suffering and injury often far exceed that from the physical violence of these periods.

3. The more immediate results in man of malnutrition are only partly known. Knowledge is particularly deficient on the important effects on work performance and capacity, on the response to concomitant disease or trauma, and on psychological characteristics.

4. Knowledge of the residues in man, that is, later or more persistent effects that are attributable to periods of severe malnutrition, is extremely deficient, in spite of the fact that such knowledge is of the greatest importance in planning for national emergencies, in devising therapeutic and rehabilitation measures, in operating compensation and insurance programs, and in general medical practice.

5. Residues from severe or protracted nutritional injury and other stresses sustained in prison and concentration camps and in famine areas during the last world war have been described by various observers. These aftereffects may be apparent for many months or years in formerly healthy men. Among the reported residues are excessive fatigue, weakness, inability to maintain proper weight, general "nervousness," excessive sweating, paresthesias, visual defects including optic atrophy, hernias developed during the period of emaciation, cardiac and gastrointestinal complaints, and bone defects. Many persons apparently recover completely from episodes of malnutrition, but in some cases, at least, there are residues that may result in serious impairment, or even total loss, of the ability to maintain gainful employment.

6. Periods of famine or malnutrition inevitably raise the question of nutritional relief and rehabilitation of the victims. Knowledge for these purposes of the best kinds and amounts of foods and their most efficient distribution and administration is extremely deficient.

7. There are important practical and theoretical questions in regard to the influence of age and sex on the occurrence and nature of residues from malnutrition and starvation. Differences in the mortality during famine have been observed repeatedly, but the possible influence of age and sex on the residual effects in survivors has not been studied. Among the major problems that relate to age and sex are possible differences in the ability to withstand starvation, the effects of maternal malnutrition on the fetus, and the speed and completeness with which rehabilitation may be achieved on a good diet.

8. The rate of growth of children is, under suitable conditions, a sensitive index to changes in the food supply and dietary practice in a nation.

Other suggested indexes, in which more allowance must be made for the operation of factors other than nutrition, include the morbidity and mortality from tuberculosis and the gross mortality of infants below the age of one year.

9. Malnutrition in children frequently results in retarded growth, particularly in terms of body weight but also in linear dimensions. Where the nutritional insult is primarily simple reduction in food intake, and this is not continued beyond a year or two, the available evidence indicates that restoration of adequate feeding results in rapid resumption of growth, so that the eventual body dimensions may not be inferior to the expectation in the absence of a period of undernutrition. Malnutrition that involves deficiencies of vitamin A or vitamin D readily results in serious permanent residues. Much less is known about possible residues in children from deficiencies of other essential nutrients or from caloric deficiency extending over a period of more than one or two years.

10. Occidentals subjected to food deprivation in the Orient tend to exhibit more serious residues than result from similar conditions of food deprivation in Western Europe. This difference may be explained, in part, as a result of the habitual diet and in the local foodstuffs used in the Orient. The foods commonly used in Western Europe in famine or periods of food shortage tend to be qualitatively superior to those eaten in comparable periods in the Orient. The question of residues of famine and malnutrition in the indigenous population in the Orient has been inadequately studied.

11. Among residues of malnutrition must be counted possible secondary effects resulting from changes in the susceptibility to, or in the course of, other disease. With the exception of tuberculosis and diabetes melitus, there is at present very little knowledge on these questions. Simple undernutrition tends to have a favorable effect in diabetes and a very detrimental effect in tuberculosis. In addition, malnutrition may influence the susceptibility to, or the course of, such important diseases as arteriosclerosis, hypertension, neoplasms, allergic states, cirrhosis of the liver, peptic ulcer, the arthritides, and certain of the anemias.

12. The problem of psychological residues of malnutrition and starvation is of great importance but has received very little study. Perhaps even more than in the case of physical residues, psychological residues are conditioned, at least in part, by the attending circumstances under which the nutritional insult is sustained. In many cases of severe malnutrition it is believed the psychological residues are large and important.

13. The conferees wish to commend the Articles which refer to food and nutrition in the Geneva Convention of August 12, 1949, "Relative to the Protection of Civilian Persons in Time of War." It should be pointed out, however, that the absence of definitions for nutritional "adequacy," for "good health," and for the evaluation of nutritional status will make for great difficulty in any application of the Convention. The implementation of such an instrument requires the use of properly defined concepts based on scientific research.

With the foregoing points in mind, and in consideration of other information, the following recommendations are made:

1. The conferees urge in the strongest terms the adoption of all effective and available measures of research, of planning, of organization, of law, and of convention, at both national and international levels, which will serve to prevent or reduce the frequency and severity of malnutrition and starvation. This is of the greatest importance for the contingency of war or other catastrophe.

2. Although the science of human nutrition contains many as yet undeveloped areas, there is already a large body of knowledge that should be fully used to prevent, to ameliorate, to evaluate, and to treat malnutrition. Decisions and planning that relate to, or that may involve, nutritional problems should in every case be based on scientific analysis. It is recommended, therefore, that properly qualified experts on human nutrition, and on related subjects of public health, agriculture, food technology, distribution, and transportation be included in, or attached to, all bodies charged with planning for eventualities in which nutritional problems may arise.

3. The effects, including residues, of periods of malnutrition have tremendous sociological and political implications beyond the limitations of ordinary medical practice. The conferees have indicated above some of the present deficiencies in our knowledge on these problems. It is clearly imperative to make strenuous efforts to increase our knowledge as rapidly as possible. It is recommended, therefore, that facilities and support for nutritional research be greatly expanded, particularly on those problems of human malnutrition that threaten large segments of the world's population in war and in other great catastrophes.

4. Canadian experience with former prisoners of war suggests that detailed scrutiny of persons who have suffered severe malnutrition in the past may yield definitive information with regard to more or less permanent residues. Of great importance in this connection are permanent visual defects and other signs of disordered neurological function. It is recommended, therefore, that systematic studies

be made on the incidence and character of neurological and other defects that may be attributable to previous malnutrition in former prisoners of war and in former inmates of civilian concentration and internment camps. The support of such studies in the U. S. would be particularly appropriate activities for such agencies as the offices of the Surgeons General of the Armed Services and of the Public Health Service, of the War Claims Commission, and of the Bureau of Veterans' Affairs.

5. There is obviously great need for knowledge on the residues of famine and malnutrition in the many areas of the world where severe food shortages are recurrent or chronic. It is recommended, therefore, that systematic studies be made in these areas so as to reveal the magnitude and character of the local problems, as well as to contribute to general understanding of the effects of habitual differences in nutritional status. The sponsorship of such studies would be appropriate for international agencies like the World Health Organization, the Food and Agriculture Organization, the International Labor Organization, and the Pan American Sanitary Bureau, as well as the local governments of the areas involved.

6. The conferees hope that the foregoing statements and recommendations will be seriously considered by the private, governmental, and intergovernmental agencies that have responsibility for developing and implementing plans and policy in regard to food and nutrition. The conferees stand ready, as individuals, to aid and support such agencies in their effort in these regards. Accordingly, it is agreed that copies of these statements and recommendations should be transmitted to the appropriate agencies and should be made available to the scientific public. Furthermore, it is recommended that these questions be considered in more detail in future conferences and discussion groups. These questions demand early and vigorous action.

Signatories present were:

J. D. ADAMSON, Department of Medicine, University of Manitoba, Winnipeg, Manitoba
JOSEPH ANDERSON, School of Public Health, University of Minnesota, Minneapolis
JOHN BERKMAN, Section on Medicine, Mayo Clinic, Rochester, Minn.
JOSEF BROZEK, School of Public Health, University of Minnesota, Minneapolis
A. J. CARLSON, Department of Physiology, University of Chicago, Chicago, Ill.
CARLETON B. CHAPMAN, Department of Medicine, University of Minnesota, Minneapolis
J. N. CRAWFORD, Directorate of Medical Services, Department of National Defense, Army, Ottawa, Ontario
W. J. DARBY, Division of Nutrition, Vanderbilt University, Nashville, Tenn.
J. GROEN, Wilhelmina Gasthuis, Amsterdam, The Netherlands
AUSTIN HENSCHEL, School of Public Health, University of Minnesota, Minneapolis
PAUL E. HOWE, Animal Husbandry Division, U. S. Department of Agriculture, Beltsville, Md.
ANCEL KEYS, School of Public Health, University of Minnesota, Minneapolis
CARL J. KOEHN, Office of the Surgeon General, Department of the Army, Washington, D. C.
DAVID LUBBOCK, Food and Agriculture Organization of the United Nations, Washington, D. C.
GEORGIA L. LUSK, War Claims Commission, Washington, D. C.
CHARLES D. MAY, Department of Pediatrics, University of Minnesota, Minneapolis
IRVINE MCQUARRIE, Department of Pediatrics, University of Minnesota, Minneapolis
OLAF MICKELSEN, Chronic Diseases Division, U. S. Public Health Service, Washington, D. C.
SERGIUS MORGULIS, Department of Biochemistry, University of Nebraska, Omaha
HELEN T. PARSONS, Department of Home Economics, University of Wisconsin, Madison
WILLIAM E. PETERSON, Department of Dairy Husbandry, University of Minnesota, St. Paul
E. E. RICE, Research Laboratories, Swift & Company, Chicago, Ill.
MARTIN H. ROEPKE, Department of Veterinary Medicine, University of Minnesota, St. Paul
MAX O. SCHULTZE, Division of Agricultural Biochemistry, University of Minnesota, St. Paul
ERNST SIMONSON, School of Public Health, University of Minnesota, Minneapolis
C. JOSEPH STETLER, War Claims Commission, Washington
HENRY LONGSTREET TAYLOR, School of Public Health, University of Minnesota, Minneapolis
RICHARD L. VARCO, Department of Surgery, University of Minnesota, Minneapolis
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CECIL J. WATSON, Department of Medicine, University of Minnesota, Minneapolis
RUSSELL M. WILDER, Division of Medicine, Mayo Clinic, Rochester, Minn.
JAMES R. WILSON, Council on Foods and Nutrition, American Medical Association, Chicago, Ill.

The following individuals were unable to attend the conference in person but have examined this statement and have expressed their adherence to it:

F. G. BOUDREAU, Milbank Memorial Fund, New York City
C. A. ELVEHJEM, Graduate School, University of Wisconsin, Madison
HUGUES GOUNELLE, Centre de Recherches de l'Hopital Foch, Paris, France
C. G. KING, The Nutrition Foundation, New York City
L. BRADLEY PETT, Department of National Health and Welfare, Ottawa, Ontario
HERBERT POLLACK, Committee on Therapeutic Nutrition, National Research Council, Washington, D. C.
HAROLD R. SANDSTEAD, Nutrition Branch, U. S. Public Health Service, Washington, D. C.
ELMER L. SEVRINGHAUS, Division of Clinical Research, Hoffman La Roche, Inc., Nutley, N. J.
G. CULLEN THOMAS, Executive Offices, General Mills, Inc., Minneapolis, Minn.

Additional signatories:

W. R. AYKROYD, Nutrition Division, Food and Agriculture Organization of U. N., Washington, D. C.
JOHN BEATTIE, Physiological Laboratory, Cambridge University, Cambridge, England
H. M. SINCLAIR, Laboratory of Human Nutrition, Oxford University, Oxford, England

About People

Robert W. Berliner has been appointed chief of the Laboratory and Clinical Section on Kidney and Electrolyte Metabolism of the National Heart Institute. Dr. Berliner will be in charge of research studies on kidney function and its relationship to the development of heart failure. He was formerly assistant professor of medicine at Columbia University.

Donald E. Gregg, chief research physician at the Army's Medical Field Research Laboratory at Fort Knox, Ky., since 1946, will head the new Department of Cardiovascular Physiology at the Army Medical Department Research and Graduate School in Washington, D. C.

Ellery H. Harvey, formerly with Sun Chemical Company, New York City, has been appointed professor of food technology at Illinois Institute of Technology. Dr. Harvey will direct sponsored research and graduate studies in food engineering.

E. Herndon Hudson, director of the Ohio University Health Service since 1940, has been named director and chief medical adviser of a WHO project in Iraq on the study and treatment of bejel (syphilis), a disease prevalent among children in that country. Dr. Hudson, an authority on tropical diseases, has been given a year's leave of absence from his university post.

Norman H. Jacobson, industrial press supervisor for Allis-Chalmers Manufacturing Co., Milwaukee, Wis., has been appointed technical information officer for the AEC's Technical Information Service in Washington, D. C. Mr. Jacobson will be responsible for providing information to industrial periodicals. The commission plans to utilize the national trade publications in expanding its program of interpreting technological developments in AEC projects for possible application to the needs of American industry.

Irvin Levin has been appointed head of the new Biophysical Instrumentation Department, Army Medical Department Research and Graduate School, in Washington, D. C. Dr. Levin has been research associate in physical chemistry at the University of Maryland, where he has been conducting studies on the photovoltaic behavior of organic substances in solution. He expects to continue his research and to apply the results to a study of catalytic photosensitization.

George H. C. McKeown has been appointed medical administrator in the Medical Division of Sharpe & Dohme, to succeed **J. William Crosson,** who has resigned. Dr. McKeown has been assistant medical director with Ayerst, McKenna & Harrison, of New York City.

Visitors

Recent visitors at the National Bureau of Standards were: **André Durand,** professor of mathematics, University of Paris, and editor of the University's *Journal of Mathematics*; **Alidol Khalili,** director, Material Testing Laboratory, University of Teheran, Iran; **John P. O'Donnell,** lecturer, Mechanical Engineering Department, University College, Dublin; **Frederik Sixma,** assistant professor of organic chemistry, Laboratory for Organic Chemistry, University of Amsterdam; **R. Uenishi,** director of engineering, Shimadzu Seisakusho, Ltd., Kyoto, Japan; and **K. Wadati,** director, Central Meteorological Observatory of Japan, Tokyo.

Jean Delville, chief of the Laboratoire de Bacteriologie, Elizabethville, Belgian Congo, will be at the Army Medical Department Research and Graduate School, Army Medical Center, Washington, D. C., for several months, studying virus and rickettsia diagnostic techniques and working on the identification of some new viruses which he isolated in the Belgian Congo. He has been sent to the U. S. by the Belgian government's Colonial Office. **José Carlos de Melo Falcao Neto,** of the Brazilian Army Medical Corps, began a 6-months' training period at the Virus and Rickettsial Disease Laboratory, September 22.

Grants and Awards

Donald Wyman, of the Arnold Arboretum of Harvard University, has been presented with the first **Norman Jay Colman Award** of the American Association of Nurserymen at their annual convention in Washington. The award is made by the Association for Horticultural Progress and is named after the first U. S. secretary of agriculture. It was awarded to Dr. Wyman for the research work done in conjunction with ornamental woody plants and published in his book *Shrubs and Vines for American Gardens.*

The Edward Goodrich Acheson Medal and Prize has been awarded to George W. Vinal, chief of the National Bureau of Standards Division of Electrochemistry and dean of the NBS staff. The award, a gold medal and $1,000, is conferred biennially for the most outstanding contribution in the fields of activity fostered by the Electrochemical Society. It will be presented to Dr. Vinal at a banquet in his honor during the society's fall meeting in Buffalo, October 11–14.

The Raymond F. Longacre Award for 1949 has been presented to Sir Charles Symonds by the Aero Medical Association of America. The award is given annually by the association to the person who has contributed most to the advancement of neuropsychiatric aspects of aviation medicine, including the development of aptitude tests for flying. The first award was presented to Ross A. McFarland in 1947, and the award for 1948 was made to Detlev W. Bronk.

The 1951 Medal of Honor of the Institute of Radio Engineers has been awarded to Vladimir K. Zworykin, electronics scientist of the RCA Laboratories at Princeton, N. J. Dr. Zworykin's early work in electronics contributed to the development of the electronic scanning method used in television.

Radio Corporation of American fellowships have been awarded to 16 predoctoral students in fields related to radio, television, and electronics.

New grants for resident fellowships were made to Columbia University for Gardiner L. Tucker, studying under I. I. Rabi; to Princeton University for Thomas R. Williams, under C. H. Willis; and to Cornell University for Hamilton Barhydt, under Lloyd P. Smith. New RCA fellowships administered by the National Research Council were given to Andrew R. Hutson, to study problems of electron emission at MIT; John G. Meeker, for research in electron dynamics at the University of Michigan; Hilliard M. Wachowski, for theoretical research on microwaves and antennas at Northwestern University; and George E. Zenk, for vacuum tube amplifier network analysis at Carnegie Institute of Technology. The new fellowship to an RCA employee went to Irwin E. Goldstein, for study at the University of Pennsylvania.

Fellowships and Prizes

The Arthritis and Rheumatism Foundation is offering fellowships for research in the basic sciences related to the study of arthritis. The fellowships provide stipends of $4,000 to $6,000 for a year, beginning July, 1951. Applications should be sent to the foundation at 535 Fifth Ave., New York 17, by *January 1.*

An annual award for research in antibiotics has been established by the Commercial Solvents Corporation, to be administered by the Society of American Bacteriologists. The award of $1,000 and a gold medal will be given to an individual or a group in the Western Hemisphere working particularly in basic research contributing to fundamental knowledge about antibiotics. Further information may be obtained from the secretary, Society of American Bacteriologists, Hospital for Joint Diseases, 1919 Madison Ave., New York 35.

The Educational Testing Service is offering two research fellowships leading to the Ph.D. in psychometrics, at Princeton University. The fellowships, carrying a stipend of $2,375 a year, are open to men acceptable to the Graduate School of the university. Competence in mathematics and psychology is required. Fellows will engage in part-time research in the general area of psychological measurement at the offices of the service and will carry a normal program of studies at Princeton. Applications must be submitted before *January 19, 1951.* Information may be obtained from Director of Psychometric Fellowship Program, Educational Testing Service, 20 Nassau St., Princeton, N. J.

The School of Mathematics of the Institute for Advanced Study will allocate a small number of stipends to gifted young mathematicians and mathematical physicists to enable them to study and to do research work at Princeton during the academic year 1951–52. Candidates must give evidence of ability in research comparable at least with that expected for the Ph.D. degree. Application blanks may be obtained from the School of Mathematics, Institute for Advanced Study, Princeton, N. J., and are returnable by *January 1, 1951.*

The American Urological Association offers annual awards of $1,000 (first prize $500, second prize $300, third prize $200) for essays on the result of clinical or laboratory research performed by urologists who have been in such specific practice not more than 5 years or by men in training. The first prize essay will appear on the program of the annual meeting of the association, to be held in Chicago, May 21–24, 1951. Further information may be obtained from Dr. Charles H. de T. Shivers, Secretary, Boardwalk National Arcade Building, Atlantic City, N. J. Essays must be submitted by *February 10, 1951.*

The American College of Chest Physicians is offering an annual international award of $250 for the best original paper on any chest disease. Five copies of the manuscript should be submitted not later than *April 1, 1951,* to the executive office of the college, 500 North Dearborn St., Chicago 10. Further information may be had from the secretary.

Colleges and Universities

Recent appointments in the **University of Colorado Department of Medicine** include Archibald R. Buchanan, professor of anatomy at Colorado since 1946, as assistant dean; Raymond R. Lanier, of the University of Chicago Clinics, as professor and head of the Department of Radiology; Cosmo G. Mackenzie, of Cornell University Medical College, as professor and head of the Department of Biochemistry; and J. Cotter Hirschberg, professor of psychiatry at Colorado, as director of the Mental Hygiene Clinic.

The University of North Carolina School of Medicine has made the following appointments to its staff: Thomas C. Butler, formerly associate professor of pharmacology and experimental therapeutics, Johns Hopkins University, professor and head of the Department of Pharmacology; J. Logan Irvin and Carl E. Anderson, associate professors of biological chemistry; John E. Wilson, assistant professor of biological chemistry; George P. Manire, assistant professor, and Milton Huppert, instructor in bacteriology; Jack H. Brown, assistant professor of physiology; James A. Green and Harold F. Parks, instructors in anatomy; and J. Henry Smith Foushee, Jr., fellow in pathology.

The University of Southern California's Department of Chemistry is now headed by Robert D. Vold, who succeeds Anton B. Burg. Dr. Burg has resigned in order to devote more time to research projects sponsored by the Office of Naval Research, including the organization and editing of an advanced treatise on inorganic chemistry. Jerome A. Berson, former research fellow at Harvard, has been appointed assistant professor of chemistry in the department.

Wayne University College of Medicine has appointed Fred L. Rights professor and chairman of the Department of Microbiology. Dr. Rights comes to Detroit from Chapel Hill, N. C., where he has been associate professor of bacteriology at the University of North Carolina.

Ernest Dean Gardner has been named professor of Anatomy and head of the department, replacing **Gordon H. Scott** who resigned as chairman of the Anatomy Department to assume the deanship of the College of Medicine. Dr. Scott will continue as professor of anatomy. Dr. Gardner is known for his many contributions in the field of joint innervation and physiology, and other aspects of neurophysiology.

Meetings

The international meeting of the **Division of Rubber Chemistry, American Chemical Society,** will be held in Cleveland, Ohio, October 11–13. Twenty-five technical papers will be given by distinguished rubber technologists from England, France, Holland, Italy, Sweden, Malaya, and Java; 20 papers will be presented by this country's rubber chemists.

A formal dedication and open house will be held at the new quarters of the Virginia Fisheries Laboratory at Gloucester Point, Va., on October 12 from 2:00 to 5:00 P.M., to be followed by a two-day scientific meeting—sponsored by the **Atlantic Estuarine Research Society**—featuring a symposium on estuarine ecology. R. E. Coker, University of North Carolina, and Waldo Schmitt, U. S. National Museum, will serve as co-chairmen of the symposium, and participants will include many outstanding men in the field. Those interested in attending the scientific sessions should write the Virginia Fisheries Laboratory immediately for reservations (rates, $1.75–$2.50 per person per night).

The National Society for Crippled Children and Adults will hold its annual convention October 26–28 at the Stevens Hotel in Chicago. Delegates from more than 2,000 state and local affiliates of the society in the 48 states, District of Columbia, Alaska, Hawaii, and Puerto Rico will obtain up-to-date knowledge of the society's program of education, research, and direct services. The meeting is open to the public, and an attendance of 5,000 is expected.

An institute on administration of scientific research and development will be presented by The American University, October 23–27, with the cooperation of the National Research Council and the AAAS. Formal registration will take place October 23, at 9:00 A.M., in the Office of the Registrar, School of Social Sciences and Public Affairs, 1901 F St., N.W., Washington, D. C. Those engaged in the administration of research and its application are eligible; others may be admitted with permission of the institute director. Applications will be accepted in the order in which they are received, and not more than 35 persons will be enrolled.

The program will be devoted to problems of research organization, administrative process in the research organization, research personnel, aids to research, and research product. Lectures by practitioners in government, industry, universities, and private foundations will present their findings in each of the topics on the program. In some instances a panel of experts will offer different points of view. Both students and speakers will participate in the discussion to follow each presentation. An advance registration fee of $10 will be credited to tuition charges of $35. Application should be made to Lowell H. Hattery, The American University, 1901 F St., N.W., Washington 6, D. C.

Miscellaneous

Postgraduate training in orthopedic surgery will be given at the Hospital for Joint Diseases, New York City, in cooperation with Columbia University College of Physicians and Surgeons, from September 28 to December 14. The course, to be held on consecutive Thursdays, will include lectures, case demonstrations, conferences on the clinical, diagnostic, therapeutic, pathologic, bacteriologic, and chemical aspects of skeletal disease, presenting a review of the modern concept of the more important orthopedic diseases. Opportunities will be provided for clinical examination of patients. Applications for registration should be made to the Assistant Dean, Graduate Medicine, Columbia University College of Physicians and Surgeons, 630 West 168th St., New York 23.

Security, Loyalty, and Science, by Walter Gellhorn, of Columbia University Law School, has recently been published by Cornell University Press. This report is the first of eight to be issued in a Cornell study of the impact on civil liberties of current governmental practices intended to ensure security and the control of subversive conduct. The two-year project is being conducted as part of the university's "Research in Civil Liberties," under the direction of Robert E. Cushman, and has the financial support of the Rockefeller Foundation.

Existence of tritium, heavy radioactive isotope of hydrogen, in heavy water, has been announced by Willard F. Libby, of the University of Chicago, and A. V. Grosse, of Temple University. Source of the tritium is the action of cosmic rays in the upper atmosphere. The tritium is carried in minute quantities to the earth's surface by rain, and collects in bodies of water. Its discovery may permit the tracing of the vertical motion of bodies of water, for the tritium is introduced at the surface of lakes and oceans. The amount of tritium at various levels could determine the length of time required for water to reach lower levels.

Deadline for the receipt of entries in the Fourth Annual Photography-in-Science Salon, sponsored by *The Scientific Monthly* (a publication of the AAAS) and the Smithsonian Institution, is *November 27.* Laboratory directors, graduate students, and other scientists doing significant work in which photography is an important tool are urged to write for information and entry blanks to the Editor, The Scientific Monthly, 1515 Massachusetts Ave., N.W., Washington 5, D. C.