

hygienic practices, and the reduction of nose cancer in nickel industry workers following the introduction of dust control measures. In these examples, it can reasonably be assumed that there has been a reduction in the exposure to the carcinogen rather than a complete removal of the cancer producing substance.

From the experience obtained in animal experiments and study of humans who have been exposed to carcinogens in the course of their work such as cited above, the panel believes that the probability of cancer induction from a particular carcinogen in minute doses may be eventually assessed by weighing scientific evidence as it becomes available.

Conclusions and Recommendations

The rapidly increasing number of new chemicals potentially useful in agriculture and food production demands vigilant and careful scrutiny of the compounds offered in order to safeguard the consumer from those that may present carcinogenic and other toxic hazards.

In applying the provisions of Section 409 (c) (3) the enforcing agency must employ the "rule of reason."

The definition of a carcinogen implicit in the language of Section 409 (c) (3) requires discretion in its interpretation because so many variables enter into a judgment as to whether a particular substance is or is not carcinogenic.

It is to be emphasized that the present difficulty in establishing whether there are permissible levels for certain possibly carcinogenic food additives is accentuated by the limited relevant scientific information available. From the experience obtained in animal experiments and study of humans who have been exposed to carcinogens in the course of their work such as cited above, the panel believes that the probability of cancer induction from a particular carcinogen in minute doses may be eventually assessed by weighing scientific evidence as it becomes available.

The special emphasis placed by the Congress on the protection of the public from the dangers resulting from the addition of possible carcinogens to food calls for prudent administration of Section 409 (c) (3) of the Food Additives Amendment of the Food, Drug, and Cosmetic Act. Since an area of administrative discretion based on the rule of reason is unavoidable if the clause is to

be workable, it is essential that this discretion be based on the most informed and expert scientific advice available. Until the causes of carcinogenesis are better understood, each situation must be judged in the light of all applicable evidence. In this way the protection of public health can best be assured.

Accordingly, the following recommendations are made:

... That the Secretary of Health, Education, and Welfare appoint a board advisory to him to assist in the evaluation of scientific evidence on the basis of which decisions have to be made prohibiting or permitting the use of certain possibly carcinogenic compounds.

The advisory board should be composed of scientists from the National Cancer Institute, the Food and Drug Administration, the U.S. Department of Agriculture, and the scientists outside the Government from a panel nominated by the National Academy of Sciences.

It would be the function of the board to weigh evidence and to make recommendations to the Secretary of the Department of Health, Education, and Welfare on the basis of available scientific data, both on applications for approval of new food additives and in all cases where the withdrawal of a prior approval or sanction is under consideration.

If existing legislation does not permit the Secretary of Health, Education, and Welfare to exercise discretion consistent with the recommendations of this report, it is recommended that appropriate modifications in the law be sought.

Members of the Panel

Detlev W. Bronk, chairman, president, Rockefeller Institute and president, National Academy of Sciences.

Robert F. Loeb, vice chairman, Bard Professor of Medicine, Columbia University—on leave.

Edwin B. Astwood, professor of medicine, Tufts University School of Medicine, New England Center Hospital.

Alfred Gellhorn, director of the Institute of Cancer Research, and professor of medicine, Columbia University.

J. George Harrar, vice president, Rockefeller Foundation.

Harold C. Hodge, professor of pharmacology and toxicology, University of Rochester.

James G. Horsfall, director, Connecticut Agricultural Experiment Station.

C. N. Hugh Long, Sterling professor of physiology, Yale University.

C. Chester Stock, scientific director, Sloan-Kettering Institute for Cancer Research.

Biological Sciences Curriculum

Study To Test New Courses

The Biological Sciences Curriculum Study has announced the establishment of centers for testing proposed new courses to improve the quality of biology taught in American high schools. Approximately 15,000 high-school pupils and 100 teachers in 28 school systems will cooperate throughout the 1960-61 school year in testing both the scientific content and the design of instructional materials.

At each center, seven high-school biology teachers and a university biologist, serving as a consultant, will take part, according to Arnold B. Grobman, director of the Curriculum Study. The nationwide evaluation program will begin in September.

The Biological Sciences Curriculum Study is an educational program of the American Institute of Biological Sciences. Funds for the study have been provided by the National Science Foundation in grants totaling \$738,000.

The Curriculum Study has its headquarters at the University of Colorado. It is an autonomous activity, directed by a steering committee of 26 outstanding biologists and educators, of which H. Bentley Glass, professor of biology at Johns Hopkins University is chairman.

Elementary School TV Biology

The television series "21-inch Classroom," in cooperation with the Children's Museum of Boston and the Massachusetts Audubon Society, has been presenting a series of 30 half-hour television programs dealing with the principles of biology. Teacher for the series is professor William H. Weston of Harvard University, and the producer is Charles Walcott. The programs have included presentation at the fifth-grade level of some of the major ideas of biology. This has involved the extensive use of live animals and plants, original film, and special art work.

During the current year the series is being used in several thousand New

England classrooms. It is broadcast by stations WGBH-TV in Boston and by WENH-TV in New Hampshire. The programs are recorded on video tape, and it is planned to make copies of these tapes and kinescopes available to other television stations and school systems that would like to use them. Distribution will be on a nonprofit basis. For further information write: Dr. Charles Walcott, Massachusetts Audubon Society, Drumlin Farm, South Lincoln, Mass.

Scientists in the News

Libbie H. Hyman, research associate in invertebrates at the American Museum of Natural History, received the 1960 Gold Medal of the Linnean Society of London on 24 May during the society's annual meeting. She is the third American and the first woman zoologist to be honored with the society's highest award, which is considered a mark of international distinction in the field of biological research. The medal has been awarded annually since 1888 for outstanding contributions to the natural sciences.

Dr. Hyman has been engaged for nearly 30 years in research and in writing her extensive treatise, *The Invertebrates*. Five volumes have been published and she is now at work on volume 6. When completed, the study will cover the entire field of invertebrate zoology, with special reference to anatomy, embryology, physiology, and ecology. It will be the most comprehensive work in its field ever published in English.



Libbie H. Hyman

The resignation of two members of the Atomic Energy Commission and the appointment of one successor were announced by the White House on 16 May. President Eisenhower named **Loren K. Olson**, general counsel of the commission since 1958, to serve the remainder of the term of **John F. Floberg**, who says that he is leaving "for a complex of reasons, largely personal." Floberg's term expires 30 June 1962.

John H. Williams is the other commissioner who is resigning. He has been ill recently and gave poor health as his reason for leaving. Both resignations are effective 30 June. The Democratic majority of the Congressional Joint Committee on Atomic Energy is expected to demand that a Democrat replace Williams, even if this means delaying action on the appointment of Olson, a Republican.

Two research scientists have been named by the American Heart Association to lifetime posts as career investigators. **Manuel F. Morales**, professor and chairman of the department of biochemistry at Dartmouth Medical School, and **Oscar D. Ratnoff**, associate professor of medicine at Western Reserve University School of Medicine, are the eighth and ninth to receive such appointments. The two men will be given a yearly award for life and will have complete freedom to do research of their own choosing at any institution they wish.

The following men went to Geneva on 12 May to represent the United States in discussions of a research program to improve detection and identification of underground nuclear explosions: **Frank Press** (chairman), director, Seismological Laboratory, California Institute of Technology; **Carl F. Roman**, assistant technical director, Office of Atomic Energy, Department of Defense; **Carlton M. Boyer**, assistant director, Nuclear Research and Reliability, Advanced Research Projects Agency, Department of Defense; **Gerald W. Johnson**, associate director, Lawrence Radiation Laboratory, University of California, Livermore; **Spurgeon M. Keeny, Jr.**, technical assistant, Office of the Special Assistant to the President for Science and Technology; **Richard Latter**, chief, Physics Division, Rand Corporation, Santa Monica, Calif.; and **Robert C. Scheid**, Department of Defense, Washington, D.C.

Milton Gross, director of the department of biochemistry, Margaret Hague Maternity Center, Jersey City, N.J., has received the E. R. Squibb and Sons Prize Paper Award of the American Society for the Study of Sterility for his report on "Cyclic Changes in the Biochemistry of the Female Reproductive Tract."

Elmer G. Butler, an embryologist, has been appointed to the Henry Fairfield Osborn professorship of biology at Princeton University. Butler has been a member of the Princeton faculty since 1926 and was chairman of the department of biology from 1934 to 1948.

Joseph Kaplan, professor of physics at the University of California, Los Angeles, has been presented with the Exceptional Service Award, highest civilian decoration given by the Air Force. The honor was in recognition of Kaplan's leadership in geophysics.

John B. Page will become dean of the Graduate College at Iowa State University on 1 July, succeeding **R. M. Hixon**.

Hixon has been on the Iowa State faculty since 1923, when he was appointed an assistant professor of chemistry. He became head of the department of chemistry in 1944, and from 1948 to 1950 served both in that capacity and as dean of the Graduate College. Since 1950 his responsibilities have been solely those of graduate dean. He will continue on the faculty in research and teaching capacities.

Page, who is dean of the college and dean of the graduate school at Agricultural and Mechanical College of Texas, is internationally known for work in soils physics and soil chemistry. He was one of the first to demonstrate the possibilities of the electron microscope in soil studies.

P. D. Cooper, director of the Virus Culture Laboratory, Medical Research Council Laboratories, Carshalton, Surrey, England, will visit this country for about 4 weeks commencing 4 June to discuss research on tissue culture and the growth of viruses, with particular reference to poliomyelitis. His itinerary includes Washington (4-7 June); Baltimore; Philadelphia; New York; Boston; Detroit; Ann Arbor, Mich.; Minneapolis; Los Angeles; San Francisco; and New York.