

Urge More Industry Study of Food Additive Problem

Public given distorted impressions . . . Sea seen as great food source

BOSTON.—The time is opportune for the formation of an industry board to deal with problems concerning food safety, D. B. Hand of the New York State Agricultural Experiment Station told the Institute of Food Technologists here during their annual meeting June 21 to 25. Such a board, he said, working closely with government agencies and with independent scientific groups, such as the Food Protection Committee of the National Research Council, would be able to contribute to the interests of the public not only in safety but also in a continuation of technological progress.

In reporting on the work of the Food Protection Committee, Dr. Hand said that it has taken an intermediate position. On one hand it has contradicted many exaggerated statements that have appeared about dangers involved in the present use of chemicals in foods. On the other hand, it is clearly recognized that new chemicals in some instances are being introduced into foods before they are adequately tested. A proposed solution he said, has been the requirement of prior approval by the Food and Drug Administration of any additives intended for use in foods. A key argument for this move has been a statement that more than 700 chemicals are being used in food, while approximately 276 of them have not been proved safe. Dr. Hand expressed the opinion that this gives an exaggerated impression of urgency and will influence uninformed people in the wrong way. For the proper evaluation of such chemicals, he asserted, it is necessary to know the extent of use and the amount entering the diet. Dr. Hand reported that one of the projects of the Food Protection Committee has been to undertake a study to survey through the food industry a list of 700 foods which constitute 90% of the total quantity consumed. In those foods about which the committee has full information there are considerably fewer than 700 chemical additives and there is no indication that any presents a health hazard.

Food Standards Problems

The present FDA law, said Dr. Hand, permits the Commissioner to draw up and promulgate standards of identity for foods. The omission of an ingredient from those standards prevents its use. This provision has a weakness, he declared, in that at present there is no definition available to allow anyone to judge independently on the basis of tests nor can anybody of experts make such a judgment under the present provisions.

The speaker declared that the food standards may have a retarding effect on the further development and improvement of foods. The underlying philosophy, he said, is that it is in the interests of a customer to give him what he expects. This sometimes imposes competitive handicaps.

It is time to do a little soul searching into the reasons for public apprehension concerning chemical additives in foods, said W. A. Krehl, Yale University, in a paper coauthored by G. R. Cowgill.

First of all, he said, there is too little factual information from industry. Secondly, members of the food and chemical industries have stimulated adverse public opinion against chemical additives primarily because of the pressure of economics and competitive situations within the industry.

While praising the thorough and competent job done by the Food and Drug Administration, Dr. Krehl said "many have questioned as has been stated 'the wisdom of combining judicial, legislative, and executive functions in a single agency.'" A system which takes several years with endless argument, in which scientists cannot agree, to define a loaf of bread, is subject to criticism. Is it any wonder, he asked, that the general public is suspicious over questions of additives?

Drs. Krehl and Cowgill suggested the establishment of a national foundation of food technology supported jointly by food and chemical industries but operated as a separate, impartial, and independent organization. The foundation would have a scientific director and a



Samuel C. Prescott (right) is presented with a citation by Bernard E. Procter of MIT. Dr. Prescott, now retired from MIT, was the founder and first president of IFT. Loren B. Sjostrom (center) of Arthur D. Little, Inc., was general chairman of the IFT meeting

governing board from industries, universities, public organizations, and government. It should marshal facts but also should contribute to informing and educating the public.

Unsuspected Substance Responsible?

The idea that it is not impossible that the elimination of some unknown substance "X" from the diet might profoundly affect public health and significantly increase the normal expectation of life was advanced some time ago by A. C. Fraser of England. The idea was discussed by E. L. Sevringhaus, Hoffmann-LaRoche, pointing out that probably the first food additives were salt, sugar, vinegar, and alcohol. Dr. Sevringhaus listed a great many materials such as vitamins, bleaching agents, antioxidants and other compounds which are now used in foods. All of these should receive biological testing before use, he declared. Referring again to Dr. Fraser's idea, he said that substances consumed as food for centuries are not necessarily harmless since millions of people have died from unknown causes during that period.

Proposed Legislation

Reminding the audience that amendments to the Federal Food, Drug and Cosmetic Act are at present under consideration, B. L. Oser, Food Research Laboratories, dealt with the status of the proposed legislation. He said that he doubted that it would be taken up before 1954. Dr. Oser compared the Miller and Delaney bills. He pointed out that according to the definitions in these bills, a substance is not a chemical additive unless it is "not generally recognized . . . as having been adequately tested." Under the present definition, he said, filing a petition for a chemical additive is tantamount to an admission that it has



Victor Conquest, Armour & Co., is congratulated following his receipt of the Appert Medal, awarded annually for contributions to the field of food technology

not been generally recognized among qualified experts that it has been adequately tested to show that it is safe. Dr. Oser noted that both the bills amended the regulatory procedure toward the chemical additives per se, rather than toward the foods in which it may be present. Thus the major responsibility for filing a petition may be expected to rest upon the chemical manufacturer rather than the food processor. However, since the definition of chemical additives is allied to their intended use, it would be incumbent upon the chemical manufacturer if he were the applicant to become fully informed as to the directions, recommendations, and suggestions for each proposed use of his products.

In addition to information concerning composition, methods of analysis, directions for use, etc., both bills require that reports be fur-

nished of investigations made to determine whether the additive is safe for the use for which it is intended. If this part of the procedure operates in the same manner as the new drug provision of the Food, Drug and Cosmetic Act, he said, toxicological data might have to be presented for each proposed use of a chemical additive. Dr. Oser took the view that the proposed amendments will make it incumbent upon the petitioner to bear the full burden of proof of safety.

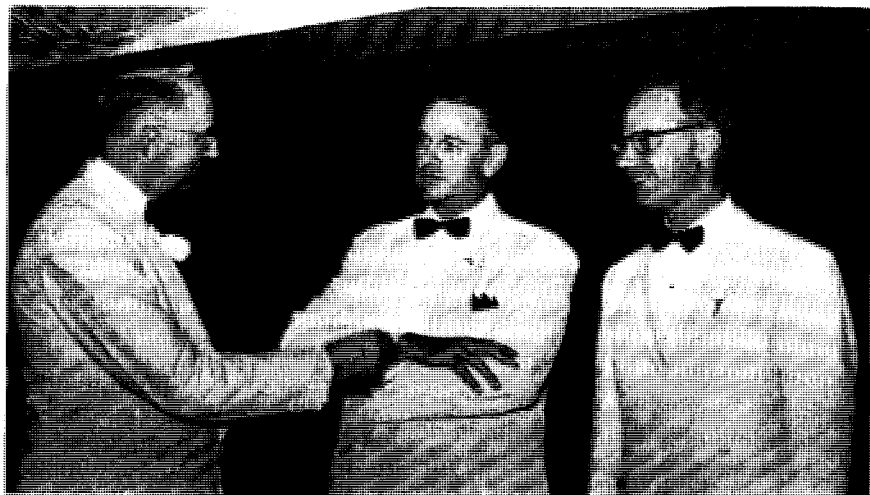
The provisions in the Miller bill for review of the administrator's findings should make it more acceptable than the Delaney bill to the agricultural and food industries, declared Dr. Oser.

Dr. Oser pointed out that the objective of expediting the standards-making process would also be served by passage of another proposed amendment, H. R. 5055, which would make possible promulgation of standards on the basis of informal conferences rather than public hearings in those cases where no controversies are involved.

J. D. Black, Harvard, surveyed economic adjustments having a special bearing on food and public health and suggested that a better solution to surplus problems might be to use subsidization. For the dairy industry, for example, subsidization of the use of milk powder in bread and other foods would be a better approach, according to Dr. Black, than continued price supports of butter.

Dr. Black suggested that the food surplus situation could be best met by shifting more consumption to meats, dairy, and poultry products which use six to seven times more acres per million calories than do wheat, sugar, potatoes, and other foods consumed directly. But more people would have to be able to buy the more expensive livestock problems. His answer to this was that the

IFT presidents, present, past and future: (left to right) new president, Berton S. Clark, American Can Co.; retiring president, Bernard E. Procter, MIT; president-elect, Charles J. Bates, Carnation Co.



Government should subsidize the feeding of low-income families instead of supporting high prices of foods.

Sea Is Great Source of Food

The sea is a great potential source of food, declared G. A. Reay, Torry Research Station, Aberdeen, Scotland. "Fish Farming" has much to offer, in his

opinion. Existing production might be quadrupled, he said. He described the culturing of fresh and brackish water fish in natural waters and special ponds as a great undeveloped resource. Natural production in tropical countries he estimated to be within the range of 445 to 1780 pounds per acre per year.

Dr. Reay said that only about 30,000

tons of the present catch of 1.3 million metric tons of whale meat is used for food. A very great amount of valuable protein is thrown into the sea, he stated.

Dr. Reay estimated that doubling of whale meat consumption and development of fish farming could add 15 million pounds a year to the world's food supply.

Knowledge of Dairy Animal Metabolism Broadens

MADISON, WIS.—Since the elements of an animal's diet determine, in a large measure, the animal's general state of health, and in the case of a dairy animal its productivity, it is logical that a technical program for an organization such as the American Dairy Science Association should be heavily weighted with discussions of nutrition. When more than 2000 members of the association gathered here June 21 to 24 to discuss progress in dairy science, the effect of dietary components, whether fed intentionally or by chance, were repeatedly under scrutiny.

The progressive narrowing of the margin between agriculture and industry was underscored by a Pennsylvania State College investigation designed to determine the value of ammoniated industrial by-products as sources of nitrogen for dairy cattle. Using 30 Holstein cows divided into six comparable groups on the basis of age, milk production, body weight, and stage of lactation, the Pennsylvania State team compared a ration containing unammoniated cane molasses and soy bean oil meal with rations of equal nitrogen content containing 10% of ammoniated industrial by-products (13 to 29% protein equivalent). Industrial materials studied were 10% ammoniated wood sugar, two combinations of ammoniated cane molasses and ammoniated

condensed distillers' molasses solubles, and 10% ammoniated cane molasses. A negative control group received neither the soy bean oil meal nor an ammoniated product. Acceptability of the industrial by-products was indicated in the end results, which showed no significant differences among the various nitrogen-fortified diets with respect to milk production and change in body weight. Performance in the negative control group, however, was significantly poor relative to the fortified-diet group.

Rumen Bacteria. Since what happens to the components of the dairy cow's diet is largely determined in the animal's rumen, a great deal of attention has been given at the University of Maryland to the behavior of bovine rumen bacteria, to determine the role they play in the host (or hostess) animal's feed utilization. Studying mixed suspensions of bacteria obtained directly from the rumen, and determining under anaerobic conditions rates of carbon dioxide evolution and ammonia production, as well as levels of volatile fatty acids, total keto acids, and lactic acid, the dissimilation of 23 naturally occurring amino acids and urea was compared. Significant activity was observed with aspartic acid, glutamic acid, serine, cysteine, cystine, arginine, urea, and to a lesser degree, threonine. In no instance was keto or lactic acid de-

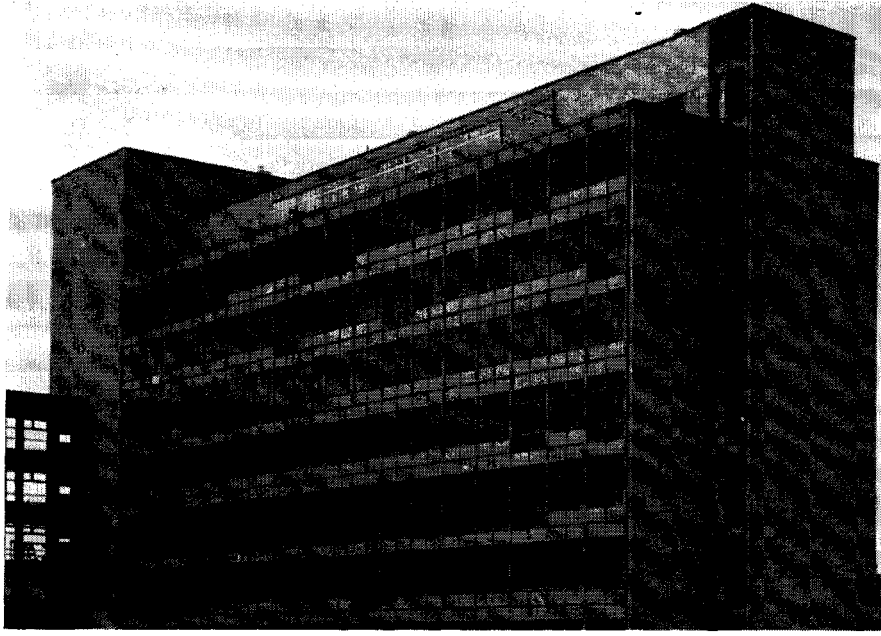
tected, and, with the exception of arginine, ammonia production was observed to be mole for mole. In all instances volatile fatty acids were found.

Carrying the work a step further to determine the nutritional requirements of the rumen bacteria, cultural methods were called into play after it was observed that for culturing maximum numbers of rumen bacteria, rumen liquor had to be incorporated in the growth medium. To characterize the active principles, various materials of known nutritional adequacy for many fastidious bacteria were substituted in the medium. Further efforts involved processing the rumen fluid in various ways such as alkaline and acid hydrolysis, oxidation, heavy metal precipitation, and dialysis; the rumen liquor also was fractionated through conventional adsorption and elution techniques. Test results indicated that peptones, meat extract, yeast extract, liver extract, feed infusions, various amino acids, and casein hydrolyzate, used alone or in combination, failed to satisfy the bacteria's requirements completely. The active factor of rumen fluid proved to be relatively stable in acid and alkaline hydrolysis, but could be extracted with activated adsorbing agents. Promising results with eluting agents point toward more use of this approach to the over all problem of bovine nutrition.

F. E. Nelson of Iowa State College (left) receives the Borden Manufacturing Award for his work on bacteriology of dairy products. Presenting the award is W. A. Wentworth, Borden Foundation. Center: J. W. Thomas (right) of the USDA receives the American Feed Manufacturers Award for his

work in dairy calf nutrition. The award is being presented by W. T. Diamond, AFMA, secretary. Right: The Borden Production Award is presented to R. L. Becker (left), University of Florida, for his work on mineral requirements of dairy cattle by W. A. Wentworth of the Borden Foundation





The John Thompson Dorrance Building of Biology and Food Technology at MIT

New Food and Biology Lab Dedicated by MIT

THE NEW John Thompson Dorrance Building of Biology and Food Technology was presented to the Massachusetts Institute of Technology by Oliver G. Willits, Campbell Soup Co., in dedication services held at Cambridge on June 25. The Campbell Co. was the principal donor of the new building, which honors a former president of the company who was an MIT alumnus of the class of 1895.

Detlev Bronk, Johns Hopkins University president, in the main address of the day, declared that the widespread recognition of the accomplishments of science has tempted many who are not scientists to control the workings of science. Society is too impatient for useful and immediate results, he said, and this impatience not only impedes research but also the teaching of fundamentals.

In a symposium on global concepts of food technology, held after the dedication ceremonies, William H. Cook, National Research Council of Canada, noted that technical assistance to underdeveloped countries has consisted largely in adapting or applying procedures used in our countries to countries where conditions are sharply different. He urged that more attention be given to the development of new processes or procedures suited to countries of limited technological development.

Food technologists are under compulsion to safeguard the public's two greatest assets, declared C. G. King of the Nutrition Foundation. They are liter-

ally taking over the pipelines from farms to stomachs. In fact, he said, civilization is dependent upon their progress in doing this, for otherwise we shall not be able to avoid the impending clash between population pressure and adequate food. Among outstanding benefits to feeding and nutrition which Dr. King mentioned as spreading throughout the world were the enrichment of cereal products and the improvements in canned and frozen foods.

In the biology symposium, held concurrently, A. Baird Hastings, Harvard, speaking on the changing frontiers of biochemistry, said that while much of the work has been developed in medical schools as an offshoot of physiology, the

biochemist has a great responsibility to agriculture, animal husbandry, and pharmaceutical and chemical industries.

The new laboratory at MIT contains about 108,000 feet of gross floor space in eight main floors and a basement. In addition to departmental offices and teaching laboratories for the departments of biology and food technology, the building has special laboratories for studies of spectroscopy, x-ray diffraction, enzymology, cell and tissue structure, biochemistry and microbiology, food chemistry, flavor, color instrumentation, and bacteriology.

Of special interest is the radiation laboratory, where food samples are evaluated after treatment with a particle accelerator and a cobalt-60 radiation source. Food engineering and pilot plant laboratories are located in the basement and greenhouses and animal rooms are on the top floor.

Industry

National Distiller's to Build Ammonia Plant at Tuscola

National Distiller's Products Corp. is planning to build a plant for producing synthetic ammonia and fertilizer nitrogen compounds at Tuscola, Ill. The plant is scheduled to get into production early in 1955 with 50,000 tons a year of anhydrous ammonia. Part of the ammonia will be converted into nitric acid for production of ammonium nitrate and nitrogen solutions.

Hydrogen for the synthesis will be obtained as a by-product from the company's ethylene plant now under construction at Tuscola. The company says that this by-product hydrogen will be more economical than hydrogen from natural gas from the standpoint of both capital costs and production costs. By-product oxygen will be obtained at the rate of 75 tons a day.

Ample storage facilities for anhydrous

On The Cover

Increasing Meat Production Calls for New By-Product Uses

FOR MANY YEARS the meat packing industry has been pointed out as one of the masters of the art of efficiency in mass production. "Everything but the Squeal" has been the slogan used to refer to the system of using all scraps and by-products resulting from the slaughtering of animals for meat. For success with such an approach, production must fit markets or markets must be developed to use the products made. The meat industry has done that very well. But as any alert observer of industry knows, patterns of demand can be changed by

competition from new products or change of choice or taste. The increasing application of chemical technology in industry has brought not only new materials to compete with by-products of the meat industry, but also has influenced other changes which have modified markets. The answer by the meat packers is to apply the results of scientific research to meet the situation with new materials or new uses for old. Increasing consumption of meat in the U. S. is indicated. This means more by-products and calls for ever greater attention to research and technology.

ammonia and nitrogen solutions will be provided to handle seasonal fluctuations in demand for these products. Total cost is estimated at about \$7 million.

Chlorine Expansion at Velsicol's Memphis Plant On Stream

Velsicol Corp. has completed the \$2 million addition to its Memphis, Tenn., plant and is in full scale production of chlorine, liquid caustic, hydrogen gas, and bleach.

The 88,000 pounds of chlorine produced each day will be used by Velsicol for production of its chemical insecticides. Part of it will also go into textiles, pulp, and paper. The hydrogen gas is piped to a nearby plant for use in making cooking-shortening. The plant also produces 110,000 pounds of caustic a day.

The addition to the plant includes a salt storage and brine preparation area, caustic preparation area, caustic evaporation building, rectifier installation, expanded electrolytic cell room, and a modern chlorine liquefaction building.

Wilson & Geo. Meyer Firm to Sell Western Phosphates Output

Wilson & Geo. Meyer & Co. has announced formation of a company to handle distribution of the phosphate fertilizers to be produced by Western Phosphates, Inc., at Garfield, Utah. The new firm, to be called Wilson & Geo. Meyer & Co. Intermountain, will be located in Salt Lake City, Utah.

Western Phosphates, a joint venture of American Smelting & Refining, Kennecott Copper, and Stauffer Chemical, is scheduled to complete its \$5 million plant early next year. It will produce 60,000 tons of treble superphosphate, ammonium phosphate, and liquid phosphoric acid initially.

John Foster will manage the new firm's office in Salt Lake. He has been managing the parent firm's office in Portland, Ore., for the past several years. Wilson Meyer, head of the parent firm, will also be head of the subsidiary. Other officers are: L. N. West, executive vice president; Ralph S. Waltz, vice president and sales manager; Thomas Harris, vice president; Jeffrey W. Meyer, secretary; and Theodore I. Stone, treasurer.

Brooks & Cahoon to Sell Sorbitol in Boston Area

Brooks & Cahoon Co. has been appointed to handle sales of Atlas Powder's sorbitol in the area around Boston and Cambridge, Mass. The Cambridge firm is a supplier of raw materials to the confectionery industry.

PEOPLE

Bishopp Resigns BEPQ Post; To Be Replaced by Knipling

F. C. Bishopp has resigned his position as assistant chief of the USDA Bureau of Entomology and Plant Quarantine to accept a position with the Oscar Johnson Cotton Foundation. He will be replaced by Edward F. Knipling. Dr. Bishopp will coordinate all of the foundation's research concerned with control of the pink cotton boll worm. His headquarters will be at Brownsville, Tex. Dr. Bishopp has been with USDA since 1904. He is widely known for his research on the control of the boll weevil and other cotton pests, the cattle fever tick, and the Rocky Mountain spotted fever tick. Dr. Knipling has been with BEPQ since 1930. Since 1946 he has



F. C. Bishopp



E. F. Knipling

been leader in the bureau's Division of Insects Affecting Man and Animals. During World War II, he was senior entomologist in charge of the bureau's Orlando, Fla., laboratory.

Theodore Marvin has been elected to the presidency of Michigan Chemical Corp. He will take on his new position sometime this month. Mr. Marvin has been director of advertising for Hercules Powder Co. since 1944 and has been with Hercules for 30 years. Montgomery R. Budd was named to succeed Mr. Marvin as director of advertising for Hercules.



Theodore Marvin

T. J. Nelson is on loan from the technical department of the California & Hawaiian Sugar Refining Corp. to the By-Products Project of the Hawaiian Sugar Planters' Association, owner of C&H. As an assistant to G. W. Aljian the coordinator of the project, Mr. Nelson will devote his attention to the possibilities of using sugarcane bagasse as a source of fiber in paper making.

Loyd L. Stitt and Stephen S. Easter have joined the entomological staff of Velsicol Corp., Chicago. Mr. Stitt has been with the Bureau of Entomology and Plant Quarantine of USDA. Mr. Easter was with the Food and Agriculture Organization of the United Nations.

Anson B. Nixon has been elected chairman of the board of Hercules Powder Co. He has been serving as a vice president, having joined the company as a chemist at the Kenvil, N. J., plant in 1915. Charles A. Higgins, former chairman of the board, resigned late last month in keeping with the company's retirement policy.



Anson B. Nixon

James H. Lum took over new duties as a director of development for Monsanto's organic chemicals division on July 1, replacing Alfred T. Loeffler. Dr. Lum has been development manager of the phosphate division. Mr. Loeffler has accepted a position with the chemicals division of Food Machinery.

Robert W. Colby has been appointed director of agricultural research for Dow Chemical Co.'s Texas Division in Lake Jackson. He will be in charge of developmental work in poultry and animal nutrition and disease control as well as herbicides at expanded facilities there. Dr. Colby has been engaged in research and development on methionine supplementation of livestock and poultry feeds for the past two years at Midland, Mich.



R. W. Henderson has been placed in charge of the Oregon State College agricultural experiment station, following the retirement of R. S. Besse. Dr. Henderson and Robert M. Alexander, formerly assistants to the director, have been advanced to assistant directors.

State College of Washington has announced that the following associate professors have been promoted to full professors: Ralph E. Erb, dairy science; Noe Higinbotham, botany; Max C. Jensen, agricultural engineering; and Seth B. Locke, plant pathology.

C. A. Svinth, Washington State extension agent, has had his leave extended to May 1, 1954, to remain at New Delhi, India, to continue his work with Point Four.