P R O C E E D I N G S

VOLUME XIX, PAGES 1 - 35

APRIL 1959

See pages 8 & 9

FOOD AND NUTRITION BOARD
NATIONAL ACADEMY OF SCIENCES-
NATIONAL RESEARCH COUNCIL
2101 Constitution Avenue
Washington 25, D. C.

CONTENTS

FOOD AND NUTRITION BOARD

Not for Publication Volume XIX, page 1

Proceedings of the meeting of the Food and Nutrition Board of the National Academy of Sciences-National Research Council, held at the National Academy of Sciences, Washington, D. C., April 3 and 4, 1959.

Present

Officers: Grace A. Goldsmith, Chairman; William J. Darby, Vice Chairman

Members: J. B. Allison, C. S. Davidson, Paul L. Day, Harry H. Gordon, Paul György (April 4), D. B. Hand, H. E. O. Heineman, C. G. King, L. A. Maynard, F. N. Peters, W. H. Sebrell, Jr., E. N. Todhunter, R. W. Vilter, R. R. Williams

Ex Officio and Administrative Staff: F. L. Campbell, Executive Secretary, Division of Biology and Agriculture, NAS-NRC; LeRoy Voris, Executive Secretary, Food and Nutrition Board; Paul E. Johnson, Executive Secretary, Food Protection Committee

Liaison Representatives: J. R. Beaton (for J. A. F. Stevenson), Defence Research Board of Canada; Adelia M. Beeuwkes, American Public Health Association; J. A. Clague, Bureau of Supplies and Accounts, Department of the Navy; Jean Crooks (for Grace Bulman), Veterans Administration; Floyd S. Daft, Institute for Arthritis and Metabolic Diseases, National Institutes of Health; Jane C. Ebbs, Office of the Quartermaster General, Department of the Army; Mary C. Egan (for Marjorie Heseltine), Children's Bureau, Department of Health, Education, and Welfare; N. R. Ellis, American Institute of Nutrition; G. E. Hilbert, Foreign Research Contracts and Grants Program, USDA; H. R. Hinton, British Joint Services Mission; Lt. Col. L. N. Hursh, Medical Research Branch, Office of the Surgeon General, Department of the Army; O. Lee Kline, Nutrition Division, Food and Drug Administration; Jean W. McNaughton, Food and Agriculture Organization of the UN; F. P. Mehrlich, QM Food and Container Institute for the Armed Forces; Lt. Col. Irvin C. Plough, U. S. Army Medical Research and Nutrition Laboratory; B. E. Proctor, Institute of Food Technologists; E. H. Stevenson, Council of Foods and Nutrition, American Medical Association; Hazel K. Stiebeling, Institute of Home Economics, Agricultural Research Service, USDA; Dorthea F. Turner, American Dietetic Association; O. V. Wells, Agricultural Marketing Service, USDA; J. R. Weisiger (for R. Keith Cannan), Division of Medical Sciences, NAS-NRC; Lt. Col. W. J. Wilson, Nutrition Branch, Office of the Surgeon General, Department of the Army

Committee Members: W. B. Bradley, C. M. Frey, W. F. Geddes, F. L. Gunderson, E. J. Lease, Committee on Cereals; R. L. Jackson, J. A. Johnston, C. W. Woodruff, Committee on Infant Nutrition; M. K. Horwitt (Executive Secretary), Committee on Nutritional Studies at Elgin State Hospital; James M. Hundley, Committee on Protein Malnutrition; F. R. Blood, J. M. Coon, Food Protection Committee

Guests: Zoe E. Anderson, F. G. Boudreau, G. M. Briggs, E. P. Campbell, D. B. Coursin, A. C. Curtis, R. W. Engel, A. L. Forbes, Paul L. Forsyth, C. E. French, Elsa O. Keiles, M. O. Lee, H. J. Lewis, W. J. McGanity, Olaf Mickelsen, P. B. Pearson, H. E. Robinson, Walter Rudolph, A. E. Schaefer, A. C. Simonpietri, Sam C. Smith, L. J. Teply, E. J. Thacker, Louis Verhoestraete, M. E. Wegman, W. H. Wright, J. B. Youmans, R. L. Zwemer

The meeting opened at 10:00 AM Friday, April 3, with Dr. Grace A. Goldsmith, Chairman, Presiding.

Dr. Goldsmith introduced and welcomed new liaison representatives and guests.

The minutes of the October 1953 meeting, Proceedings, Volume XVIII, pages 23-46, were APPROVED as circulated.

REPORT OF THE EXECUTIVE SECRETARY--LeRoy Voris

This is the fifty-fifth meeting of the Food and Nutrition Board.

There have been no organizational changes of note. Two of the Board members are on leave: Dr. Wendell H. Griffith is in India for a year, and Dr. John H. Davis has gone to Lebanon as Director of the UN Relief and Works Agency in Beirut. (Drs. Darby, Shank, and Maynard have been on recent missions for the Interdepartmental Committee on Nutrition for National Defense, and Dr. Paul Gyorgy has been in Japan for UNICEF.)

Dr. William J. Darby will serve as Vice Chairman of the Board during Dr. Griffith's absence. Dr. Griffith's chairmanship of the reorganized Committee on Dietary Allowances will be continued by Dr. Robert Shank, who served as that Committee's Chairman before Dr. Griffith's appointment.

There have been some changes in liaison representation. Dr. Theodore Friedemann has retired from the Army Medical Research and Nutrition Laboratory and Col. L. M. Hursh has been transferred to the Office of the Surgeon General, Department of the Army, here in Washington. Col. Irvin C. Plough replaces Col. Hursh as the liaison representative from the Laboratory. Dr. Adelia M. Beeuwkees is the new liaison representative from the American Public Health Association.

The Board was shocked by the sudden death last December of Dr. Elmer M. Nelson. The following message was transmitted to Mrs. Nelson on behalf of the members of the Board:

> "I am enjoined to express on behalf of the Food and Nutrition Board and the Division of Biology and Agriculture our deepest sympathy on the passing of Dr. Nelson. We share your great loss because his wise counsel and genial personality were for so many years a part of the spirit of the Board. This spirit shall continue as an inspiration to all of us."

Dr. O. Lee Kline has succeeded Dr. Nelson as Chief of the Nutrition Division in the Food and Drug Administration, thus having to relinquish his recent appointment as Chief of the Food Division.

With reference to meetings held since October, the Committee on Dietary Phosphates and Dental Caries met on January 13 in Washington with representatives of the National Institute of Dental Research and of other interested agencies. The Committee on Nutritional Studies at Elgin State Hospital met in Elgin on January 13. On February 26-27 the Committee on Amino Acids met in Washington. Although the report of this committee, "Evaluation of Protein Nutrition," was accepted for publication at the March 1958 Board meeting (Proceedings, Volume XVIII, page 7), committee members felt the meeting was necessary to consider further revisions of the report. Yesterday the Committee on Infant Nutrition met here, as did the Executive Committee. The meetings of the Food Protection Committee are reported separately.

During December 1958, Secretary Fleming of the Department of Health, Education, and Welfare held a series of meetings pertaining to the activities of the Food and Drug Administration with representatives of national organizations. These covered such subjects as "Food Additives and the Use of Pesticides," "Colors in Foods, Drugs, and Cosmetics," "Food Standards and Economic Cheats." The Academy, the Food and Nutrition Board, and the Food Protection Committee were invited separately by the Secretary to be represented. The Executive Committee delegated Dr. William Darby to be the representative of the Board, and he was also named to represent the NAS-NRC and the Food Protection Committee. He attended, together with Dr. Paul Johnson, the meeting with the Secretary on December 18.

As noted in the October 1958 Proceedings, the Committee on Cereals' resolution on the use of enriched corn meal, white rice, and white flour for school lunch programs in the United States was adopted by the Board and transmitted to the Administrator of the Agricultural Marketing Service of the U. S. Department of Agriculture, and to the Commissioner of the Food and Drug Administration.

The Board's publication on "Recommended Dietary Allowances," and committee reports on "The Role of Dietary Fat and Human Health," and "Cereal Enrichment" continue strongly in demand. The Food Protection Committee has published two reports since the last meeting of the Board. These will be cited in that committee's report.

REPORT OF THE FOOD PROTECTION COMMITTEE--W. J. Darby

There have been the following appointments to the committee and subcommittees: Dr. Henry F. Smyth, Jr., of the Mellon Institute has been added to the committee; Dr. Ross A. Chapman of the Food and Drug Directorate of Canada has been appointed to the Subcommittee on Food Technology; Dr. Julius Coon is now Chairman of the Subcommittee on Toxicology, and Dr. Henry Smyth is Vice Chairman.

The annual joint meeting of the Liaison Panel and the Food Protection Committee was held December 11-12. A symposium on problems of safety associated with the use of packaging materials for foods was held and included a panel discussion of "food-grade" packaging materials. Speakers and participants in the panel discussion were:

W. J. Darby, L. W. Elder, E. M. Mrak, B. L. Oser, D. B. Hand, L. E. Clifcorn, R. C. Crain, A. C. Frazer, A. J. Lehman, H. F. Smyth, Jr., and J. B. Tuttle.

The committee met again on March 18-19, part of the time jointly with the Industry Committee. The Subcommittee on Carcinogenesis met on November 12, January 7-8, February 23-24, and March 30-31. The Subcommittees on Food Technology and Toxicology met informally December 11-12, and the Subcommittee on Toxicology met again on April 2.

"Food Packaging Materials, Their Composition and Uses," NAS-NRC publication 645, prepared by the Subcommittee on Food Technology is in print as is "The Safety of Polyoxyethylene (8) Stearate for Use in Foods," NAS-NRC publication 646, by the Subcommittee on Toxicology.

Three reports in process are the initial report of the Subcommittee on Carcinogenesis, described in the October 1953 Proceedings (Volume XVIII, page 27); the revision of "The Use of Chemical Additives in Food Processing," NAS-NRC publication 398; and a revision of "Principles and Procedures for Evaluating the Safety of Intentional Food Additives."

Dr. Darby asked Dr. Hand, Chairman of the Subcommittee on Food Technology, to comment on progress regarding the compilation of the use of chemical additives in foods. Dr. Hand said the revision is being prepared with the cooperation of industry and the trade associations. To obtain information the associations are canvassing their members. Through the efforts of Dr. F. N. Peters, Chairman of the ad hoc group from industry, and some of the industry members of the liaison panel of the FPC, the Subcommittee on Toxicology expects the revised compilation to be more complete quantitatively.

In addition to the revision of "Principles and Procedures for Evaluating the Safety of Intentional Food Additives," the Subcommittee on Toxicology is reviewing and compiling information on the toxicology of the glycerides of lauric acid. This activity was initiated when the FPC received enquiries from the British Ministry of Agriculture, Fisheries, and Food, and from American business concerns as to the basis for a statement in a committee report intimating that these compounds are not safe for use in foods. A similar implication appears in current and proposed Food and Drug Administration definition and standards of identity for some foods.

The Food Protection Committee is considering either participating in or directing the preparation and maintenance of an American codex of food additives, a bromatopoeia. An ad hoc subcommittee has been appointed to consider whether development of a bromatopoeia for the United States is desirable, and whether it is appropriate and advisable for the FPC to be the base for this development. The subcommittee is directed to advise the FPC on the expected general magnitude of the task and to provide an estimate of resources necessary to accomplish it. Members of the subcommittee are:

Chairman, John F. Mahoney, Merck and Company; D. B. Hand; I. J. Hutchings, H. J. Heinz Company; Lloyd Miller, U. S. Pharmacopoeia; R. T. Milner, Food Technology Department, University of Illinois; B. L. Oser, Food and Drug Research Laboratories; H. C. Spencer, Dow Chemical Company; and F. H. Wiley, Food and Drug Administration.

The Public Health Service has established a study section on Toxicology. On request of the PHS, the Food Protection Committee assisted in planning for and developing the section. This group, together with the Committee on Toxicology of the NAS-NRC and the Food Protection Committee are considering sponsoring a National Conference on Toxicology.

The Food Protection Committee continues to receive exceptional cooperation and assistance from its Liaison Panel and generous financial support as grants from industrial concerns, commercial laboratories, and technical consultants. There were 143 grants made in 1958.

* * *

Dr. King asked what progress is being made toward some degree of agreement on an international basis on legislative regulations for food additives.

Dr. Darby replied that the joint FAO-WHO expert committees have discussed subjects basic to any effort to standardize legislation. Members of the Food Protection Committee, Industry Committee, and Liaison Panel, not as members of these groups but as individuals, have attended the joint expert committee meetings. The international agencies are attempting to get the basis for evaluation of additives first, then proceed with evaluation of certain additives, particularly some of the more controversial ones.

Possible development of an international Bromatopoeia is being considered. Should the United States establish a national Bromatopoeia, the two might serve to promote ultimate agreement, legislatively, as to standards of food-grade additives, and additives which would be judged safe up to certain levels.

Dr. Davidson asked about lists of chemical additives which he and others received for review from the Food and Drug Administration.

Dr. Kline explained that by asking qualified individuals, many chemical compounds can be made exempt from the regulations under the Food Additives Agreement. The idea is to exempt as many chemical compounds as possible where the safety is completely known. This list of chemical compounds to be regarded as exempt will appear the second week of April. The final regulations under the Food Additives Amendment appeared in the Federal Register March 28.

Dr. Davidson wanted to know if the Food Protection Committee considers the compounds and advises regarded them. Dr. Darby replied that under the

present legislation all substances must be judged on either experimental evidence or on the basis of use and common knowledge. The FPC is not serving as an official referee in the judgment of safety from the standpoint of common knowledge. The list of individuals has been compiled from a large number of sources including an informal request from the Food and Drug Administration to the FPC.

STATUS OF IRRADIATION PRESERVATION OF FOODS--H. E. Robinson summarized the situation as follows:

"Radiation has been conceived as accomplishing several results in connection with preservation. The attainment of these results requires the use of particular amounts of radiation. A knowledge of what is required for each purpose is significant not only in accomplishing the purpose but also in establishing the degree of other changes, for example, flavor changes, resulting from the radiation treatment. Hence, such knowledge is basic to all other considerations.

"The most radiation-resistant bacterium of public health significance is Clostridium botulinum. While the concept that the radiation dose required to destroy this organism will vary with the food in question has been accepted, the current working figure for complete destruction of this organism is 4.8 million rad. This is a large amount of radiation.

"For pasteurization, the dose requirement varies greatly with the food item and with the desired product life extension. In all probability, most pasteurizing applications will fall within the range of 50,000 to 500,000 rad.

"A possible practical use of the method has to do with Trichinae sterilization in pork. The dose required to produce sexual sterilization (not death) for this parasite is considered to be about 30,000 rad.

"Another possible practical use is sprout inhibition in tuberous vegetables. This dose appears to be of the order of 7,000 rad and is fairly critical since other changes affecting storage stability are produced by larger amounts of radiation.

"The most important factor concerned, the block in any commercial use of this material in the meat industry to date, has been product acceptability. Changes induced by radiation vary greatly with the food item in question and with the amount of radiation employed. Of the changes involved in food acceptability from an organoleptic point of view, the following may be listed:

> "Flavor change uniquely different but resembling scorching; color changes, both darkening and bleaching, and also change of character.

"Textural changes, especially noticed with fruits and vegetables; and
"Changes on storage of foods resulting from action of agents not controlled by radiation, including enzyme reactions and chemical reactions.

"To give a complete picture would require an individual discussion of each food item. However, it may be noted that, at sterilizing doses, flavor changes are virtually non-existent in certain sea food items such as oysters and shrimp. Likewise, chicken and pork display hardly detectable off flavors. Beef, on the other hand, ordinarily develops a strong off-flavor. Recent work at the University of Michigan indicates that certain combinations, either natural or synthetic, of materials found in tomato will control the development of off-flavor in beef. Dairy products, in general, are very bad. Work at M.I.T. is under way on a process of concurrent radiation and vacuum deodorization. This process shows some promise.

"At pasteurizing doses, many products have acceptable flavors, including most meats, sea foods, and certain fruits and vegetables. In particular instances, there may be other changes induced by the radiation which will affect the acceptability of the product. This is especially true in meats where chemical changes lead to appearance degradation in a short time. It would appear that there may be some useful applications of pasteurization in the treatment of certain fruits and vegetables such as citrus fruits.

"The level of radiation required to control trichinae in pork does not affect its acceptability. Likewise, the level of radiation proposed for control of sprouting has no effect on acceptability of potatoes and onions.

"In all foods which contain naturally occurring enzymes, radiation at the sterilizing level and below does not inactivate such enzymes. The amount of radiation which will inactivate these enzymes appears to be of the order of several times that required for sterilization. Hence, it is present thinking that some other process for inactivating enzymes will be needed. At this time, the most effective method seems to be heat inactivation. Thus, one may conclude that foods which contain enzymes will first be heat-treated and consequently will have some cooked characteristics. Failure to inactivate the enzyme leads to flavor changes, texture changes and, in certain instances, the growth of tyrosine crystals through hydrolysis of the protein, for example, in meats.

"Product acceptability has been evaluated largely by scientifically trained people. There has been some exposure to consumer-type groups in academic circles and in certain military establishments. Perhaps a fair summary of the results to date would be as follows:

"Even with strong irradiated flavors, an inexpert group on first exposure will not detect them. Practically all testing with inexpert groups has involved single exposures; hence, there is no current knowledge as to what will happen on replication. Work with expert panels indicates that ability to detect irradiated flavor can be improved through practice, and once a sensitivity to it has been developed, the flavor becomes objectionable.

"What is needed are additional consumer studies involving replications. It is probable that the Army Quartermaster will conduct such studies in the near future.

"A great deal of effort has been expended both with private funds and with Army money on investigating the wholesomeness of irradiated foods. Much of this work has been planned by highly competent groups, including the Federal Food and Drug Administration, the Army Surgeon General, and various academic and industrial organizations. The findings to date have been almost exclusively favorable. Studies involving short- and long-term animal feedings, enzyme system studies, carcinogenic activity, and limited human feeding have pointed to no real difficulty attributable to changes caused by irradiation. One investigator has observed a hemorrhagic syndrome in rats fed beef. Current thinking is that this observation has no significance to the wholesomeness of irradiated beef.

"Currently, there is considerable concern in the area of induced radioactivity in irradiated foods. When certain forms of ionizing radiation are employed, certain atoms present in the food become radioactive. These effects occur principally with the use of high voltage electron beams, although they will result from the employment of gamma ray sources, which include some neutron flux. The level of radioactivity induced is low but measurable. One might hold the view that the level is so low as to have no significance when one considers other sources of radioactive atoms normal to the human diet, or when one considers exposures to ionizing radiation normally encountered from various sources such as therapeutic and diagnostic X-rays and cosmic rays. However, this subject is under very active consideration by the Army Surgeon General, the Army Quartermaster, and the Federal Food and Drug Administration. One can understand the viewpoint that holds objection to any added ionizing radiation exposure. To indicate how seriously this matter is being considered, the Army recently prohibited the consumption of any irradiated food by any Army personnel.

"The significant forms of radiation for preservation are electron beams and gamma rays. There have been available for a number of years various sources of electron beams, the most significant of which are the Van de Graaff, the resonant transformer, and the linear accelerator. The first two sources appear to be the least expensive; however, they cannot produce electron beams beyond 5,000,000 volts. The linear accelerator theoretically has no top limit, and the Army Ionizing Radiation Center at Lathrop, California, is to be equipped with a 24 million volt linear accelerator. This will provide a penetration of about six inches of unit density materials.

"Gamma ray sources are principally of two kinds: (1) the fission products from uranium or plutonium reactors; or (2) artificially made radioactive materials such as cobalt 60. The gamma rays usually have a penetration of a foot or more. The fission products can be used as purified materials, such as Cesium 137 or "hot" fuel rods taken directly out of a reactor. It is probable that the Army Ionizing Radiation Center will be equipped with a cobalt 60 gamma ray source.

"While there is considerable difference of opinion on this point, it would appear that the electron beam sources are more economical than the gamma sources at this time.

"One might analyze the work to date, as far as food items are concerned, as largely directed to proving wholesomeness and finding out which items are acceptable organoleptically. There has been some basic research to find ways to control the flavor changes resulting from radiation. So far, this has not been very fruitful. The notable exception seems to be the work at the University of Michigan where, apparently, materials have been found which block the chemical reactions involved in the flavor change. It is clear that much more basic research needs to be done in order to establish radiation preservation as a workable food process."

After Dr. Robinson's report, the Food Additives Amendment of the Food, Drug and Cosmetic Act was discussed in relation to the question of safety of irradiated foods. Dr. Paul Day said officers of the Food and Drug Administration, in interpreting the amendment, feel it is mandatory that any material added to food which is potentially carcinogenic must be prohibited, regardless of whether or not the level of induced radiation would produce cancer.

Dr. Peters said a good many people in industry interpreted irradiation of food essentially as being the addition of a "food additive." Industry asks of the FDA if the irradiated food is or isn't safe to use. It is not that an irradiated food cannot be used, he said, unless the FDA takes the position it has not been demonstrated to be safe. Practically, there is no difference in viewpoint except from the standpoint of lawyers.

Dr. Darby thought the amendment might be clarified later to indicate safe levels of radiation when evidence now accumulating is available. If, on the other hand, the radiation level is, over a long period of time, surmised to induce cancer, the present interpretation by the FDA would hold.

Concern was expressed with regard to increasing amounts of strontium 90 in milk. Dr. Kline explained that if the level can be demonstrated to be carcinogenic from natural causes, such milk can be removed from the market. Milk could also be removed from interstate commerce if, when treated with cobalt 60, any radioactivity at all resulted.

Dr. Pearson said the position of the FDA may be equivocal if taken in perspective with the total increase in dispersed radioactivity apart from that induced by irradiation of food.

Dr. Proctor reported that ionization research at MIT has shown some very promising as well as disappointing results, and that food preservation by irradiation shows important possibilities after only a decade of research. He emphasized the need for broader acceptability tests.

Dr. Forsyth noted the urgent concern of the Department of Defense in the subject of irradiation of foods. A decision is critically needed as to how to proceed with development of the 24 MEV linear accelerator. Our leadership is challenged and we cannot afford to be wrong.

Dr. Hand asked about the National Academy of Sciences' Studies on Biological Effects of Atomic Radiation. Dr. Voris replied that in June 1956 the six committees in the coordinated studies made a report on radiation-induced biological effects. These committees have been asked to appraise and again to report on the present status of scientific knowledge in this field, the degree of potential hazard from such radiation, and to recommend further research that should be undertaken. The six committees are: Genetic Effects of Atomic Radiation, Pathologic Effects of Atomic Radiation,

Meteorological Aspects of the Effects of Atomic Radiation, Oceanography and Fisheries, Effects of Atomic Radiation on Agriculture and Food Supplies, and Disposal of Radioactive Wastes.

REPORT OF THE COMMITTEE ON DIETARY PHOSPHATES AND DENTAL CARIES--C. S. Davidson

The responsible agencies for a study of dibasic calcium phosphate in preventing dental caries are the National Institute of Dental Research, the National Institute of Arthritis and Metabolic Diseases, and the Division of Indian Health of the Public Health Service. The Committee on Dietary Phosphates and Dental Caries of the Food and Nutrition Board and the Board are advisory to the study.

The committee held its first meeting at the time of the last Board meeting thereby having the advantage of the discussion of the Board. A preview of the study was presented to the Board during the Board meeting (Proceedings, Vol. XVIII, pp. 28-30). From the preview, presented by members of the institutes, the committee and the Board raised questions and problems which they felt needed to be considered before the study was undertaken. These were presented in a letter from Dr. Davidson to Dr. S. J. Kreshover, the Associate Director of the National Institute of Dental Research, and were answered satisfactorily at the second meeting of the Committee on January 13, 1959.

At the January meeting the committee met with representatives of the responsible agencies and the protocol of the study was thoroughly discussed. The children to be used are Indian students in eight boarding schools in North and South Dakota. Originally two schools in Alaska were to be in the program, but these have been omitted.

The Board had strongly recommended that a physician be added to the study group. Dr. Kreshover reported that Dr. Leo Lutwak, a capable physician with experience in calcium and phosphorus metabolism and bone formation, of the National Institute of Arthritis and Metabolic Diseases would be assigned to the study for a few weeks each year. More importantly, the Public Health Service officers who are responsible for the health of the Indian children will be working closely with the study group. This, with the addition of Dr. Lutwak to the study, satisfied the Board's recommendation that a physician be in close touch with the work.

Dr. Kreshover cited a study to be undertaken by Dr. Bibby and his co-workers of the Eastman Dental Dispensary in Rochester, under a grant from the National Institutes of Health. This group plans to study an isolated Amazon community and four or five children's institutions in New York State at the same dibasic calcium phosphate (2%) level being used in the study in the Dakotas. Dr. Kreshover stated coordination between the two groups would be maintained.

An excellent report was presented by Dr. A. L. Russell of the National Institute of Dental Research, who gave a statistical breakdown of how the study was planned. Allocation of test and control groups will be made randomly by schools. Matching of age groups will be accomplished by stratification principle designed to show large differences. Any effect less than 35% will not be significant. Dental examinations will be made in successive Aprils in 1959 through 1961. Dietetic studies will be continuous. Careful biostatistical planning has been made so interpretation of the data will be possible at the conclusion of the study. This satisfied members of the committee who had had questions concerning the time and planning of the study as presented in the original protocol.

The question was raised at the Board meeting as to whether a small preliminary metabolic study might not be advisable. This was also discussed at the January meeting of the committee. Dr. Genevieve Stearns referred to her data on high calcium intake and that of Dr. Janice Smith at the University of Illinois. These data and data from the NIAMD led the committee to believe the amounts of calcium proposed to be added to the diet, even when the calcium was in a relatively more soluble form, would be quite harmless. It was decided that a sufficient amount of work had been done to make a metabolic study in advance unnecessary.

The problem of fluoride in water and food was discussed, again at both the Board and committee meetings. Analyses are being done now and will be continued during the study, so that this factor is carefully controlled.

Before and during the project the study of the food intake of the children is being carefully studied and well handled.

The committee voted at the close of its meeting to recommend to the Board approval of the study.

* * *

Dr. Olaf Mickelsen thanked the Committee for its generous assistance and reported on progress in the school study arrangements. Dietary studies have been made to ascertain the amounts of milk, vitamin D, and bread consumed by the children. Their present diet includes approximately three-quarters of a quart of milk per day, and an extra half pint for younger children. Present calcium intake is approximately one gram. Calcium added in the bread will raise the level to approximately two grams.

Each school has been paired off against another school by the statistician on the basis of the fluoride level in the water, the bread intake, the types of children in the school, and so forth. The random picking of the schools has been done by the statistician and none of the investigators know which schools will get the added dibasic calcium phosphate.

The calcium phosphate will be added to salt used in the bread for the test group and the control group will receive the salt plus equal amount of flour. Dr. Mickelsen noted that the calcium-phosphorus ratio in the diet would be approximately one to one.

Later this month the first dental examinations will be made on all children in the study. This will include an examination by Dr. Irwin Ship, dentist for the study, for decayed and missing teeth, and a bite X-ray, which will be evaluated by three different dentists. At the same time heights and weights will be taken, and beginning in September, heights and weight determinations will probably be done every two months during the first year. Blood samples for hemoglobin determination and possibly urine concentration tests will be taken in September.

Dr. Sebrell asked if any result obtained at the end of the study could be attributed to the calcium or to the phosphorus. Dr. Mickelsen replied the study would not show this, but that Dr. Frank J. McClure of the National Institute of Dental Research, Dr. Harris at MIT, and others have been studying the effects of phosphates in reducing the incidence of dental caries. Indications are that the phosphate ion, not the calcium, is beneficial.

Sodium phosphate, Dr. Mickelsen said, is not being used in the present study because it would disturb the calcium-phosphorus ratio, and secondly, because the addition of a substance as basic as sodium phosphate would make the bread-baking a problem. Both problems are overcome in using dibasic calcium phosphate. This phosphate has been ingested by similar age children over a significant period of time with no metabolic embarrassment.

Dr. Darby asked about calcium content of the water supply. Dr. Mickelsen said water samples from all the schools had been analyzed for fluoride, calcium, phosphorus, magnesium, and a number of other elements. The calcium content in the water is relatively low. He commented that the question of high calcium intake was recognized and that as a result of deliberations on the part of the Metabolism and Nutrition Study Section of the NIH, a Symposium on the Effects of High Calcium Intake was being co-sponsored with the Federation of American Societies for Experimental Biology to consider the subject at the April meetings of the Federation.

Dr. Joseph A. Johnston cited his calcium balance data from intakes of 800 up to 2400 milligrams and noted there was a physiological ceiling at about 1800 after which added calcium would merely appear in the stool with no untoward effects.

REPORT OF THE COMMITTEE ON INFANT NUTRITION--R. L. Jackson

At the committee's first meeting, April 2, 1959, the committee decided its major objective for the year would be to review critically the methods for assaying nutrition of infants and children and attempt to define standards of reference for evaluating data now available.

A review of recently published and currently unpublished material will be made, i.e., the unpublished report of the Committee on Nutrition of the American Pediatric Society on protein-amino acid requirements in early life; the articles by Drs. Harry Gordon and Emmett L. Holt in the current issue of the Journal of Pediatrics which represent the two schools of thought with regard to protein requirements in infants; the unpublished report on protein nutrition of the Food and Nutrition Board's Committee on Amino Acids.

Three major meetings should also contribute new data, as well as studies now going on as a result of controversies concerning infant requirements. The pertinent meetings on protein requirements in infants and children are: a session at the meetings of the Federation of American Societies for Experimental Biology in April; a panel discussion at the International Pediatric Congress in Montreal in July; a symposium at Cornell Medical School in October by the Council on Foods and Nutrition of the American Medical Association.

By the fall of 1959 the committee plans to present standards of reference and, a year from now, hopes to prepare a preliminary report for the Board.

* * *

Dr. Goldsmith gave briefly the background for the creation of the committee, mentioning the many unsolved problems in infant nutrition, in particular the problem of protein requirements.

REPORT OF THE COMMITTEE ON MILK--H. E. O. Heineman

The Committee on Milk has not met since before the last Board meeting and presented no formal report at this meeting. Dr. Heineman reviewed the committee's recommendation, presented at the Board's meeting last October, concerning the addition of vitamins A and D to skim milk, both fluid and dry. This subject has been under study by the Board for some time. The Board approved the recommendation, and the Executive Committee formulated a formal statement which has been incorporated into the policy of the Board with regard to the addition of nutrients to foods (Proceedings, Volume XVIII, page 33).

* * *

In reply to Dr. Hand's question as to whether there are commercial applications of these additions, Dr. Heineman said he knew of no commercial use with regard to the dry products, but that there are many commercial uses.

Dr. Zoe Anderson inquired if the Board has considered specifying a precise upper limit to the restoration level for vitamin A. With respect to the dry product, Dr. Heineman replied there can be no legal addition at this time for any such product which is to move in interstate commerce. The level will be set by either Congress or the Food and Drug Administration, whichever takes over the promulgation of a standard.

REPORT OF THE COMMITTEE ON CEREALS--R. R. Williams

Dr. Williams noted that Senator Olin Johnston of South Carolina had introduced a bill, S. 651, prescribing the enrichment of all rice distributed under the school lunch program in accordance with the Board's action (Proceedings, Volume XVIII, page 36).

He noted also the prospect that public hearings on the matter of riboflavin in enriched rice would be called. The riboflavin requirement is currently held in abeyance because no completely satisfactory method has been found to control its yellow color. Dr. Williams requested sources of any evidence that would elucidate the need for riboflavin among the rice-eating population in the United States.

COMMENTS ON THE CURRENT FOOD SITUATION--O. V. Wells

Dr. Wells commented on (1) a set of three tables on food consumption experience through 1958, (2) probable changes in food supplies in 1959 as compared with 1958, including the longer-run outlook for increased supplies of poultry and meat, (3) the current legislative interest in food distribution programs, and (4) the resolution which the Food and Nutrition Board passed at its last meeting (Proceedings, Volume XVIII, p. 36) recommending that the U. S. Department of Agriculture supply enriched flour, cornmeal, and rice, in appropriate packages, for use in connection with the School Lunch Program.

(1) The three tables mentioned were prepared for an article for Nutrition Reviews. The first table showed approximate consumption of food per capita, retail-weight equivalent, by major food groups, for 1935-39, 1947-49, and 1958.

The second table translated these available foods into actual nutrients compared with the recommended dietary allowances per person per day in 1958 as calculated from the Food and Nutrition Board's recommendations for different age, sex, and occupation groups, averaged together on the basis of the appropriate population data for 1955. The recommended dietary allowances are in terms of food ingested so they are not directly comparable with the estimated supplies of the various nutrients going into the home calculated in terms of equivalent retail weights without any allowance for preparation, cooking losses, or plate waste. It is obvious then, that the available supplies of nutrients must run above the dietary allowances if the recommended allowances established by the Board are to be met.

The third table showed selected nutrients available by income class in diets per person per day from food used at home during a week in the spring of 1955. Much has been written about relationships between food expenditures and family incomes. Such data are more direct measures of consumer preference than of the nutritive adequacy of the diets. The table attempts to show the actual nutritive content of the diets of families at various

income levels. There are some differences, but the relatively uniform supply of nutrients available to families in different income classes is surprising, which is another way of emphasizing the fact that much of the malnutrition in the United States today is a matter of food choice or personal preference rather than an income problem.

(2) Although it is too early in the year for wholly reliable estimates of food use in 1959, certain significant changes from 1958 are already apparent. Meat consumption is likely to average about five percent higher with practically all the increase being in pork. Citrus crops have come through the winter and early spring without major freeze damage, and more normal supplies of oranges should be available than was the case in 1958. Winter and early spring vegetable crops are also larger than those of a year earlier. The outlook for supplies of other foods, including dairy products, is generally favorable to the continuation of per capita consumption in 1959 at about the same rates as in 1958.

On the basis of these prospective changes, average supplies of several of the important nutrients may show some improvement in 1959. More pork means more protein, thiamine, and niacin, while more citrus means more ascorbic acid.

Feed grain supplies are at a record high, and the current prospect is for further increases in hog numbers in 1959 which would mean another increase in pork for 1960. Meanwhile, marketings of ready-to-cook chicken and turkey, which ran 15.6 pounds in 1935-39, 22 pounds in 1947-49, and 33.9 pounds in 1958, will apparently show further increase. Farmers and ranchers increased their numbers of beef cattle and calves by about 4 million head in 1958, with a similar increase in prospect for 1959. This means increased supplies of beef some two, three, or four years ahead.

(3) With regard to the current legislative interest in Congress in food distribution programs, to date in the new Session of Congress, 12 bills have been introduced in the House and two in the Senate relating to food stamp plans. There are presently eight bills in the House and four in the Senate having to do with making funds available for supplementary food purchases for donation to schools and needy people, and eight bills in the House and two in the Senate to provide additional funds for the Special School Milk Program.

Domestic and foreign donations of surplus foods continue at a high level. For the first half of fiscal year 1959, donations to schools had a value of 35.5 million dollars as compared with 76 million dollars for the entire preceding fiscal year. The corresponding figure for institutions was 16.2 million dollars as compared with 33.5 million dollars; for needy persons, 62 million dollars for the first half of the current fiscal year as compared with 272.5 million for all of fiscal 1958.

The last report on the number of needy persons receiving food in the United States, including Puerto Rico, showed 5,102,582 recipients in the United States and an additional 602,253 recipients in Puerto Rico. Altogether, distribution

of surplus commodities to needy persons is now being made in forty-four States, the District of Columbia, Puerto Rico, and the Trust Territory of the Pacific Islands, with 158 cities and 1,193 counties participating. The largest number of recipients as of February 1959 was 780,423 in Pennsylvania, 602,253 in Puerto Rico, 536,129 in Michigan, 440,993 in Mississippi, 374,516 in New York, 297,789 in Arkansas, 294,866 in West Virginia, 278,808 in Kentucky, and 260,159 in Oklahoma.

(4) A resolution at the last meeting of the Food and Nutrition Board, expressed the opinion that "the distribution of corn meal, white rice, and white flour by the U. S. Government to the National School Lunch Program should be only in nutritionally enriched form and in packages that prevent contamination of the contents." (Proceedings, Volume XVIII, page 36)

Since corn meal and white flour are distributed in enriched form and in packages about which no complaints are received, it is assumed that the resolution was chiefly directed to problems connected with rice. In some areas, especially the State of South Carolina, there is a feeling that enriched rice should be distributed, so packaged that it would not necessarily have to be washed. Currently rice is being distributed to schools in 100-pound burlap bags and such rice does, of course, need to be washed.

The official position of the U. S. Department of Agriculture with respect to enrichment of rice was set forth in a letter from Assistant Secretary of Agriculture, Don Paarlberg, to the then Chairman of the Food and Nutrition Board, Dr. C. A. Elvehjem, under date of February 13, 1958. The position stated in that letter was that if South Carolina or any other State wished to enrich and package surplus rice in smaller or different containers, the Department would consider shipping the rough rice from warehouses via some selected mill or mills enroute to the State, provided the State was willing to assume the additional or above-normal costs for milling, transportation, and handling inasmuch as the Commodity Credit Corporation rice is normally available in rough or unenriched milled form, packed in 100-pound burlap bags.

As a result of the Food and Nutrition Board's resolution, the USDA is reconsidering the rice enrichment problem for the coming school year, but the decision may well be to continue current policy, chiefly because the Commodity Credit Corporation is obligated to dispose of its commodities at the lowest possible cost.

* * *

Dr. R. R. Williams stated that more progress has been made in the past year or two to secure some enrichment of rice in the United States than in all preceding years of the Board's existence. Enriched rice has been on the market only the past two years. It was difficult in introducing the idea of rice enrichment in other countries when the United States had no rice enrichment programs. Because of its effect abroad, Dr. Williams felt the

resolution was more significant than the particular issue it raised concerning rice for the school lunch program. Dr. Harry Gordon asked how much surplus foods were going to families with incomes less than $2,000. Dr. Wells said this could be estimated to some extent. In addition to the more than 5,100,000 recipients within the continental United States, about 14 million school children receive some quantities of surplus foods. There is also an institutional distribution program with over a million people in it. Some surplus foods now go to at least 20 million out of the 175 million Americans. These foods include enriched flour and corn meal, dry skim milk, significant quantities of rice, and a good deal of butter.

* * *

REPORT OF THE COMMITTEE ON NUTRITIONAL STUDIES AT ELGIN STATE HOSPITAL--M. K. Horwitt

Dr. Richard W. Vilter, new Chairman of the committee, introduced Dr. M. K. Horwitt, Executive Secretary of the committee, who gave the following report:

The committee met in Elgin, Illinois on January 17-18, 1959 and reviewed the current phases of the tocopherol project. The highlights can be discussed under four headings: (1) the variable response of the erythrocytes of our subjects to peroxide hemolysis changes, which are not entirely explained by the variations in plasma tocopherol levels although the phenomenon can be completely inhibited by large excesses of tocopherol, (2) the appearance of duodenal ulcers in a number of the subjects, (3) the possible effects of relatively large amounts of tocopherol in increasing the reticulocyte count in subjects with lower hemoglobin levels, and (4) the relationship of dietary unsaturated fatty acids and tocopherol to the occurrence of cerebellitis in chicks with comments on similar histopathology noted in one infant.

The fact that supplementation with tocopherol at levels of about 30 mg. per day did not cause a return of the "hemolysis test" results to preexperimental levels has been discussed at previous meetings of this body. Such data continued to be abnormal after many months of supplementation as long as the high intake of unsaturated fats was continued. For the past few years, one viewpoint, not shared by most of the collaborators, has been that changes in the lipid structures of the erythrocytes were responsible for the unexplained differences obtained in the hemolysis test, i.e., since the rate of oxidation of linoleic acid is twelve times that of oleic acid and this oxidation can be inhibited by tocopherol, the alterations may be explained by assuming that the ratio of unsaturated lipids in the erythrocyte can vary with the diet and this change makes the R.B.C. more sensitive to peroxide hemolysis. To test this hypothesis, gas chromatographic techniques have been applied to the analysis of erythrocyte fatty acids for the past two years. Making use of the new argon ionization detectors it has become possible to analyze 10 microgram samples of erythrocyte fatty acids into 18 or more components to obtain evidence that the unsaturated fatty acids in the erythrocytes do indeed vary with dietary intake. The change

in the proportions of linoleic acid present are particularly striking. This is interesting, since in animal work now in process of publication, it is noted that linoleic acid is the most powerful of all the potentiating agent of tocopherol deficiency studied. This aspect of the work is most exciting. Evidence can be presented to show that dietary changes can alter the composition of the lipoproteins in the stroma of the erythrocytes. To be specific, every sample of erythrocyte lipids so far tested from subjects on the controlled corn oil containing diet had a significantly higher linoleic to oleic acid ratio than found in any of the patients who were on the regular hospital diet. It now remains to determine how long it takes to revise this effect by using coconut oil, which is low in linoleic acid, in place of corn oil. The next obvious step is to determine whether this change can also be observed in the brain lipids of chicks and rats on different lipid intakes. This study is now in progress.

The fact that eight subjects in our study showed duodenal ulcers on X-ray examination was discussed at some length at the last meeting in Elgin. Since then, fourteen subjects from a nearby ward, selected to be equivalent in age and diagnosis, have been examined by the same roentgenologists and no duodenal ulcers were noted in this group. Five of the eight subjects with ulcers were from the tocopherol depleted group, two were from the tocopherol supplemented group and one from the group which received the hospital diet. While this distribution makes interpretation difficult it should be noted that the latter three subjects had, on several occasions, shown a low tocopherol and increased "hemolyses", either because the supplement was not adequate to counteract the effect of the highly unsaturated lipid content of the diet or because they had been included in the group who had been used as controls in the study of the effects of triiodothyronine on the tocopherol requirement. You may remember that the tocopherol supplement had been increased from 15 to 30 mg. per day after three and a half years on the diet because the unsaturated lipids had gradually and unexpectedly caused a marked decrease in the plasma tocopherol levels of the so-called control group. The ulcers have responded well to symptomatic treatment which included the removal of the oxidized fat from the diet, and the healing process has been confirmed by X-ray examination. To date, nothing further has been found to aid in the interpretations of the mechanisms involved in their formation.

At the October 1958 meeting of this Board, a single case was commented on in which the administration of large doses of tocopherol coincided with an increase in the reticulocyte count in a depleted subject who had had a pronounced loss of hemoglobin. Since then, partial confirmation has been obtained for the validity of a reticulocyte response after administration of tocopherol acetate in four other subjects, but the significance of these data must await a more thorough and better controlled examination of this observation at a later date when we expect to supplement some other subjects. It should not be implied from these comments that tocopherol is clinically useful in the regeneration of hemoglobin, especially where there is no history of a high intake of unsaturated lipids.

Also discussed at the last meeting of the committee in Elgin was the observation made by Dr. Percival Bailey on the brain of an infant who had been hospitalized because of a large, rapidly growing tumor mass in the abdomen. The brain showed a hemorrhagic endarteritis of the cerebellum, which finding was histologically similar to the chages Dr. Bailey had noted in the cerebellum of chicks which had been fed unsaturated lipids. (This study on chicks has been accepted for publication the Archives of Neurology and Psychiatry and should appear shortly.) Since the meeting at Elgin, information on the diet of this infant has been obtained to show that none of the vitamin preparations fed contained any tocopherol and that for the period from August 20 to September 9, 1958, the infant was maintained on intravenous feedings containing 300 cc. of Lipomul, 250 cc. of Aminosol, plus additional 5% Dextrose, each day. This Lipomul contains 15% cottonseed oil. Cottonseed oil contains about 50% linoleic acid. X-ray therapy given during this period to the extent of 1800 R to abdomen and 1200 R to chest, may have been a contributing factor in peroxidizing the lipid provided to the infant and in destroying traces of tocopherol in the tissues. Dr. Bailey considers the similarity of the histopathology in the infant with that found in chicks to be most striking and says that this is the first time he has ever noted this type of cerebellitis in a human brain.

It is becoming increasingly apparent that we may have to change our plans about terminating our studies on the metabolism of unsaturated lipids in man.

* * *

REPORT OF THE COMMITTEE ON AMINO ACIDS--J. B. Allison

The committee completed its final deliberative work on the report on protein nutrition at a meeting on February 26-27. The manuscript is now undergoing final editing and should be ready for publication this summer.

In regard to future activities, the committee will follow instructions of the Board in developing lines of research needed to clear up some continuing questions, and it will keep the Board abreast of developments.

NUTRITION IN INTERNATIONAL PROGRAMS

Dr. Goldsmith noted that the Board had always been interested in international nutrition but had not participated actively until the Committee on Protein Malnutrition was established. Because there are many international programs in government and within the Academy-Research Council related to nutrition, a special review of some of these was planned for this meeting. Also, the Board has moved to set up a special committee to study how the Board might be helpful in international programs involving nutrition.

REPORT OF THE COMMITTEE ON PROTEIN MALNUTRITION--W. H. Sebrell, Jr.

Dr. Sebrell referred to the report circulated at the last meeting of the Board (Proceedings, Volume XVIII, page 34) which reviewed the use of the $275,000 initial grant from the Rockefeller Foundation. The request for an additional $300,000 has been granted and the time extended to December 31, 1961. This

money is specifically limited to basic research, the United Nations agencies carrying the developmental programs. The basic research on peanut and cottonseed flours has been essentially completed, and the United Nations Children's Fund is now proceeding with acceptance tests and field trials of these products. The products on fish, coconut, sesame, and soy products are in varying stages of progress. The committee plans to give further attention to legumes.

There has been no satisfactory product developed yet using fish flour, although attempts have been made in South Africa, Chile, Morocco, Norway, and the United States.

* * *

INTERDEPARTMENTAL COMMITTEE ON NUTRITION FOR NATIONAL DEFENSE

Dr. Arnold E. Schaefer, Executive Director for the Interdepartmental Committee, enumerated the governmental departments involved in the committee's program: State, Defense, Agriculture, International Cooperation Administration, Health, Education and Welfare, and the Atomic Energy Commission.

The program of the ICNND has now extended to the following nine countries and Alaska: Iran, Pakistan, Korea, Philippines, Turkey, Libya, Spain, Ethiopia, and Peru. In Peru, with excellent cooperation, the team led by Drs. L. A. Maynard, R. E. Shank, and Philip L. White, has examined some six thousand people including children, pregnant and lactating women, as well as military personnel.

Future plans include surveys in Ecuador (July), Viet-Nam and possibly Laos.

The follow-up on these surveys is perhaps the most important phase of the program. Iran has established a National Institute of Nutrition, and the Seventh International Medical Congress in Iran was devoted to nutrition. An international congress on nutrition is planned in Pakistan to include representatives from member countries of the erstwhile Bagdad Pact countries. Follow-up in the Philippines, Libya, and Ethiopia is proceeding.

The survey reports are processed for publication as time allows and, in addition, the manual on survey procedures is being prepared on methods of food analysis and on methods of preservation practices for countries outside the United States.

Relations of the ICNND Program to the Department of State

Mr. Walter M. Rudolph of the Office of Science Adviser in the Department of State reported that the ICNND program made six major contributions in support of the Department's foreign policy programs: (1) the work extends scientific information (2) the survey teams demonstrate effective ways of international cooperation (3) technical assistance aid is extended since the laboratory equipment is usually left in the country surveyed (4) the training program is notable when local doctors, chemists, and technologists work together with our own experts (5) the survey is a "people-to-people" project, the results are

directly observable by the people examined, and are applied directly observable by the people examined, and are applied directly to the people who need help (6) the program is very much a part of the national defense program in developing the health and vigor of friendly countries. In all of these senses, the ICNND is helping in the achievement of the foreign policy objectives of the United States.

The procedures for initiation of surveys, in themselves, serve to bring the attention of many people to nutrition problems. The request must come from a foreign country through diplomatic channels. A request through our embassy in the country includes not only the embassy proper but also the ICA missions, military advisors, U. S. Information Service, and all the foreign mission "family." Many people have to get acquainted with the purpose, methods, and personnel of the survey. When the request reaches the Department of State, again many people are involved. The dispatch is duplicated and gets wide distribution in various offices. The request then goes to the ICNND and back again to the State Department for reply to the requesting government. This involves more people and more channels. After the preliminaries are complete, the State Department cooperates in the implementation, e.g., getting equipment through customs and keeping embassy doors open.

After the preliminary report has been prepared by the survey team and reviewed by the ICNND, the State Department studies it critically from the standpoint of wording that might be offensive or contrary to customs of the country. Then the approved report is transmitted for distribution to ministers of defense, health, agriculture, and education in the country surveyed. The recommendations serve as a guide for local policies. As the local policies are worked out in the foreign country, they impinge upon the work of the ICA missions abroad and upon ICA here

Relations of the ICNND program to the International Cooperation Program

Dr. E. P. Campbell pointed out that the multi-discipline nature of the ICA which covers agriculture, education, community development, industry, etc., made it difficult to establish a uniform viewpoint in an agency so diverse. However, in relation to the ICNND, the scientific approach has provided the ICA operating branches with good guidelines for future developments.

In any one year, assistance by the United States toward alleviating famines, epidemics, and disasters abroad is quite a substantial figure. ICA's non-emergency program makes both regular and special contributions to many of the international organizations--the World Health Organization, the Pan-American Health Organization, the Food and Agriculture Organization, and others, for their work. Nutrition receives financial assistance and assistance in the field through ICA's contributions to the various international organizations.

In the ICA's community development program, programs in food culture and use have improved the nutritional status of many people in quite a number of countries, as has ICA's extensive program in agriculture. Combined with

improvements in technology and extension work in the agricultural field, the resulting improved nutritional status is marked. The Educational Division of ICA has more than eighty home economists distributed around the world in more than thirty countries. They are full-time members of the ICA family who are teaching the elements of home economics in various places in the world.

Dr. Arthur C. Curtis was called on to supplement the remarks of Dr. Campbell. He noted that the Public Health Division of the ICA could help the survey teams through the U. S. Operation Missions (ICA Missions) by contacting officials, recruiting local personnel, and especially in the follow-up program. In Libya and Ethiopia, for example, the ICA missions are recruiting local personnel and planning continuing local nutrition programs. In Ethiopia, ICA has a direct control in the public health college and training center. The results of the survey will provide good teaching material which Ethiopia can use for years to come. In the recent Peru survey, Dr. Philip White met with the ICA personnel to describe the objectives and methods of the survey.

Thus the surveys are a very valuable tool and contribute helpfully to development of the countries' resources, both human and material.

Relations of the ICNND Program to the Department of Defense

Dr. John B. Youmans, Technical Director of Research for the Surgeon General of the Army, discussed the responsibility of the Armed Forces of the United States for the nutritional health of the Armed Forces in allied countries. Cooperation goes on in peace time and more direct responsibility would occur in time of war. Insofar as civilian populations may come under the control of the military, our Armed Forces may have a definite responsibility for the nutritional health of the civilian populations as well.

Among the direct relationships of the Department of Defense and the Offices of the Surgeons General of the three services to the ICNND are (1) direct financial support of the Interdepartmental Committee, (2) personnel supplied by the armed services, (3) military assistance groups abroad, and (4) support for the survey teams and assistance in the follow-up after the surveys.

The services, in turn, gain indirectly by the epidemiological research being done and by the experience of the survey teams in training personnel.

As to follow-up, the military e ncourages establishment of nutrition programs on the local level abroad in medicine and food production, and assists by consultation and by providing limited amounts of supplies and equipment to help the countries continue nutrition work.

Since the backbone of the military is the general population, the armed services have a continuing interest in civilian health as well as in the military forces in countries friendly to the United States. Transfer of information goes on in many ways. For example, in Iran, the Director of

Medical Nutrition Laboratory is growing chickens in order to show the local people how to grow healthy chickens which the Army, in turn, can buy.

* * *

Dr. Sebrell commented that private groups, in particular, the Williams-Waterman Fund, have also worked with the ICNND in successful efforts to supplement government activities in helping people to help themselves. The Williams-Waterman Fund last summer did a study in Haiti in cooperation with the Interdepartmental Committee. Private foundations could also work with volunteer agencies and health departments in making an attack on malnutrition from a different viewpoint in needy areas of no military interest.

U. S. NATIONAL COMMITTEE OF THE INTERNATIONAL UNION OF NUTRITIONAL SCIENCES -- R. W. Engel

All U. S. National Committees of international scientific unions adhere to their respective unions through the National Academy of Sciences. The U. S. National Committee for Nutritional Sciences was organized in 1957, with assistance from the Academy's Office of International Relations, in order to comply with the Constitution of the International Union of Nutritional Sciences which specifies that each country adhere through its National Committee. Impetus for organizing the National Committee was the Vth International Congress on Nutrition to be held in Washington in 1960. The National Committee is helping to plan for the Congress and will serve as co-host with the American Institute of Nutrition at the time of the Congress. The organizing committee for the Congress was established by the American Institute of Nutrition in 1955.

The U. S. National Committee is composed of sixteen members, nine of these appointed by the National Academy of Sciences from nominations submitted by the Council of the American Institute of Nutrition. Three members are ex officio voting members: the Chairman of the Food and Nutrition Board, the President of the AIN, and the President of the Fifth International Congress. Four ex officio members are liaison members with the Academy, and Dr. Elmer V. McCollum, Honorary President of the Vth International Congress is also a member.

The U. S. National Committee has met twice -- last spring with the Organizing Committee for the Congress, and last fall at the time of the meeting of the Food and Nutrition Board.

The International Union of Nutritional Sciences is presently affiliated with the Council of International Organizations in the Medical Sciences. The U. S. National Committee has as one of its objectives affiliation with the International Council of Scientific Unions, since nutrition deals as much with agriculture as with the medical sciences. Thirteen international scientific unions are affiliated with ICSU. The U. S. National Committee feels it should seek membership in ICSU in order to have nutrition truly represented in the International Council.

Relation of the U. S. National Committee for Nutritional Sciences to the NAS-NRC Office of International Relations

Dr. Andre C. Simonpietri of the Office of International Relations described the activities of OIR in assisting in the advance work necessary to the creation of a national committee in cooperation with appropriate Divisions of the National Research Council and appropriate scientific associations.

Several national committees in addition to the one for nutrition are not affiliated with ICSU, for example the National Committee of the International Union Against Cancer. An unusual combination in which biology and agriculture are also interested is the International Institute of Refrigeration. This is an intergovernmental body. The U. S. Government felt it was not prepared to seek membership officially as a Government, but was prepared to say that the Academy-Research Council was the proper organization to represent the scientific and technical aspects of refrigeration in the United States for an international body. Along with twenty some countries represented by their Governments in the International Institute of Refrigeration, the National Academy of Sciences, through its National Committee of the IIR, also adheres to that body, even though the Academy is non-government and non-profit.

The standard pattern, however, in international scientific cooperation is through the U. S. National Committees adhering to ICSU, and Dr. Simonpietri offered the services of the OIR in assisting the U. S. National Committee for Nutritional Sciences in its efforts to become affiliated with the ICSU.

PLANS FOR THE VTH INTERNATIONAL CONGRESS ON NUTRITION -- C. G. King

Dr. C. G. King, President for the Fifth Congress, reported that the committees are actively preparing for the congress. Committee chairman are: Program, Dr. W. H. Sebrell, Jr.; Organizing Committee, Dr. Paul Gyögy; Finance, Dr. E. L. Severinghaus; Hospitality, F. S. Daft; Lectureships, Dr. W. J. Darby; Publications, Dr. H. Stiebeling; Exhibits, Dr. H. E. Robinson; Public Information, Dr. LeRoy Voris; Women's Hospitality Committee, Mrs. C. G. King and Mrs. E. M. Nelson. The next meeting scheduled is a joint meeting of the U. S. National Committee for Nutrition and the Organizing Committee for the congress. The Finance Committee is working to raise the $250,000 considered the minimum needed to conduct the congress properly.

The second announcement to go out to scientific personnel over the world is in press and will be ready for distribution in about two weeks. The office of the secretary of the Federation of American Societies for Experimental Biology will handle the mailing because the secretary, Dr. Milton O. Lee, is secretary for the congress. Twenty-five hundred copies will go to individuals in foreign countries, and packets of announcements will be sent as requested by nutrition associations abroad to their memberships. This procedure is thought to be the most effective way of reaching most of the scientists professionally interested in nutrition in other countries. In the United States, the announcement will be sent to the complete mailing lists of the American Federation of Societies for Experimental Biology, the Society

of Biological Chemists, and to many members of the physiological and medical societies, as well as to a list selected by the American Dietetic Association.

The final mailing of application forms for titles of papers, abstracts, and registration will go out in about October. After responses are received, the final program will be arranged.

As with any large program, many details have to be worked out to keep the planning moving forward. Limited fellowship money is available to assist younger scientists from other countries in their travel expenses. Dr. Darby will have the task of distributing the money among as many applicants as possible.

The scientific program is being centered on panels in which prepared papers will be distributed to be read in advance by those attending the congress. The panel meetings will be used for discussion which, it is hoped, will bring out current thinking and problems in the field of nutrition. There will be simultaneous translation in four languages during the panel sessions. Panel topics are: evaluation of the nutritional status in man, the effects of processing and additives on the nutritional values of food, lipids in health and disease, animal nutrition and food production, maternal and infant nutrition, and proteins and amino acids in human nutrition, and finally, a quick survey of new developments and possibilities in nutrition research.

In addition to the panel discussions, a group of formal papers will be presented on the preservation of foods by ionizing radiation, metabolism of fission products, the use of radioisotopes in nutrition research, nutritional physiology of ruminants, new aspects of carbohydrate metabolism, micronutrients in plant and animal nutrition, and the function and role of the vitamin. Simultaneous translation will also be available for this group of papers.

The final day of the congress will be taken for a worldwide survey of food needs and resources. This should be a topnotch international program--the highlight of the entire week's conference. The topics will be (1) a consideration of the world's increasing population in terms of food problems and the implications for food requirements (2) comprehensive and intensive reviews of the world's limitations in soil and water resources, (3) prospects and programs which look most promising for increasing world production and distribution of foods, (4) identification of the major nutrition problems facing the world today, (5) the socio-economic factors that limit production and consumption of foods, (6) prospects of meeting the protein needs of the world, and (7) food and the protection of public health from a worldwide point of view.

* * *

Dr. Sebrell noted that the panel technique mentioned by Dr. King for the congress is to be tried experimentally at the April Meetings of the American Federation of Societies for Experimental Biology. Papers for one session of the American Institute of Nutrition will be distributed beforehand. During the session, panel members will give summaries of their papers and then discuss questions of interest to the audience.

INTERNATIONAL PROGRAMS IN THE NATIONAL INSTITUTES OF HEALTH -- J. M. Hundley

Dr. Hundley discussed the international programs supported and administered by the National Institutes of Health. Nutrition is a part of several of these programs. The international programs of the NIH total about five million dollars. Moneywise, these programs are about one and one-half percent of the total NIH program.

Dr. Hundley reviewed the more important programs and procedures through which research is being supported internationally. One is research grants which can be made to foreign investigators. In practice, however, a rather restrictive policy has been employed to qualify a foreign investigator for a grant. Either the investigator must be unusually outstanding and talented, or he must be in a situation where he has unique economic facilities or unique material to study. The total grant program overseas is presently about 1.8 million dollars--123 grants in thirty countries. Of these, eight grants in six countries are for nutrition research. Financially, this comes to about ten percent of the total grants overseas, which is perhaps a respectable percentage if one considers all the areas in which the NIH is interested.

One special grant of $300,000 was made to the World Health Organization last May to permit planning an expanded program of medical and health research. Under this grant, WHO has elected, among some ten to fifteen fields, to include nutrition. WHO has convened an expert group to lay out an expanded nutrition research program.

NIH has a program for supporting foreign research fellows for research in the United States. The program was initiated last year and supported sixteen fellows from eleven European countries. This year the program will support fifty-five fellows from thirty countries. These people are picked by national committees in each country. Each committee forwards four nominees and NIH screened from them, strictly according to merit and not according to program or scientific field.

Another program works in reverse, i.e., a U. S. scientist may study in foreign laboratories on a research training basis. In the current year ninety-two Americans are studying in some fourteen countries. A little more than half of these are in England.

NIH also has a visiting scientists program whereby a foreign scientist can be brought to the NIH to do research. Currently there are 108 of these from thirty-one countries. Some of these are in nutrition.

Grants are made to support international conferences. For example, three of the Institutes have made grants to assist in supporting the forthcoming International Congress on Nutrition.

A series of mission exchanges is being supported with Russia. The U. S. Public Health Service is committed to eight of these, and in six of the eight, the NIH is providing the financial backing. One exchange has a metabolic disease mission which includes two nutritionists, one medical and one biochemical.

NIH also has provision for sending its staff abroad, and people who receive our grants here in the United States may use the travel fund portion of their grants to travel to foreign meetings and to visit foreign institutions. This aspect has recently been liberalized. Formerly, even though a grantee had the available travel funds, he had to get permission from NIH before he could travel abroad. This has now been changed, whereby if he has the travel funds, he may, within the policies of his own institution, use these to travel abroad, and all he has to do is to notify NIH that he has done so.

Lastly, the NIH supports a program of translating selected literature from Soviet Russia. Some journals are translated in full; others are abstracted. In addition, editors of some twenty journals select specific articles they would like to have translated. These are translated and mailed free to about four hundred medical and other institutional libraries, and are also available for purchase.

Basic legislation for the National Institutes of Health does not specify whether the institutes can or cannot operate overseas, or whether they should. Consequently the overseas aspect of the program has been minor. The Hill-Fogarty Bill would change this by creating an Institute for International Health Research with an appropriation authorization of fifty million a year. This legislation is pending in Congress. If the legislation passes with its present provisions essentially retained, a truly significant international program would develop for the support of research training, of an international communication in health and medical sciences, for direct research operations, for broad surveys of disease, and many other measures.

NAS-NRC SURVEY OF TROPICAL MEDICINE -- W. H. Wright

Any survey of the needs in the field of tropical medicine must include nutrition. It was decided the NAS-NRC Survey should consider the infectious and nutritional diseases, tropical physiology and climatology, environmental hygiene, and zoonoses and other diseases of domestic animals--the last because of their impact on nutritional problems in the tropics. The main and most difficult problem will be in gaging the impact of the non-notifiable infectious diseases and the nutritional diseases in the tropics on the general health picture.

Dr. Wright gave a brief history of the origin of the survey, its objectives, and the general geographic areas to be studied. In 1953, when researches on tropical medicine were very lean, Dr. Frederick J. Brady, then President of the American Society of Tropical Medicine and Hygiene, appointed a committee to consider the general problems of needs and support for the field. Dr. Albert Sabin, the committee's first chairman, and the committee members

interested several agencies in the project, and last year Dr. R. Keith Cannan, Chairman of the Division of Medical Sciences of the Academy-Research Council, was instrumental in securing support for the survey from the Rockefeller Foundation, the National Institutes of Health, and from the Armed Forces Research and Development Board.

In Miami last November, Dr. Sabin's committee met during the meeting of the American Society of Tropical Medicine and Hygiene to outline the survey's objectives. The objectives chosen were: to survey the present status of disease in the tropics and its impact on the health, well-being, and economy; to determine the support now available for research, medical care, and control of disease in the tropics; to project future needs and evaluate the amount of additional support required to meet these needs.

FOOD AND AGRICULTURE ORGANIZATION -- J. W. McNaughton

There have been two recent organizational changes in the Food and Agriculture Organization of the United Nations. Dr. Norman Wright has been appointed Deputy Director-General. Before his appointment he was head of the Scientific Advisors Division of the Ministry of Agriculture, Fisheries, and Food of the United Kingdom. He has served on many FAO committees. Now for the first time, in Dr. Wright, FAO has someone at the top policy level with a close interest and background in nutrition.

The second organizational change is the creation of a Technical Department headed by Dr. Frank Parker of the United States. Dr. Parker is an agriculturalist formerly with the International Cooperation Administration in India. The Technical Department was formed by grouping together the various technical divisions in FAO.

As part of the reorganization, the Nutrition Division now consists of four branches. They are Food Processing and Preparation, Nutrition Services, Food Consumption and Planning, and Home Economics.

FAO is setting up a regional office for Africa south of the Sahara with headquarters in Ghana, and it is proposed to open the office in June. Some staff appointments have already been made. There will be a nutrition officer in Ghana.

Dr. Wendell H. Griffith of the Food and Nutrition Board is serving with the Food and Agriculture Organization in India this year while on sabbatical leave from the University of California. A food technologist has been appointed to the regional office in Santiago. These are examples of part of a program for strengthening the regional offices, especially those in the developing countries.

There is to be a seminar on food and nutrition problems in the Belgian Congo in May. This is a follow-up of training courses held for people working in nutrition in Africa since 1952. The seminar will be a joint FAO-WHO activity. The thirty participants will be selected in cooperation with FAO and WHO from people who have attended the previous training courses.

Another activity in Africa was a meeting on legumes held last November. This meeting served, in part, to intensify FAO's interest in considering the nutritional values and the possibilities for using legumes as a source of vegetable protein.

Dr. Verz Goddard of the U. S. Department of Agriculture is working in FAO's Food Consumption and Planning Branch on a study of fat consump tion data from a number of countries. Funds for the study are provided by the National Health Institute, and office space is provided by FAO in its headquarters in Rome. FAO and WHO are interested in the study from the standpoint of possible effects of dietary fat on coronary diseases.

Two recent FAO publications are the report on milk and milk products in human nutrition, written by Dr. S. K. Kon, and the report of the meeting on irradiation preservation of foods held in the United Kingdom last year.

The Food and Agriculture Organization, with the International Atomic Energy Commission, is planning a training course on the use of radioisotope techniques in agricultural research which will be held at Cornell University from July 20 to September 10, 1959.

* * *

Dr. Hundley gave an example of cooperation between agriculturalists and nutritionists in work reported during the FAO conference on legumes in Africa. The agriculturalists picked out the most promising species of beans from their standpoint, and the nutritionists chose the most promising species from the standpoint of nutritional value. Then twenty species of beans were chosen which were promising from both sides to be grown and actively studied.

WORLD HEALTH ORGANIZATION -- W. J. Darby

A brief summary of the World Health Organization's interest in nutrition may be found in a small volume entitled, "The First Ten Years," which contains a chapter on nutrition written by Dr. R. C. Burgess, Chief of WHO's Nutrition Section. In this chapter, Dr. Burgess outlines the development of the interest of WHO, FAO, and other agencies in protein malnutrition and WHO's establishment of the Protein Advisory Group, the work on development of a method of iodation of crude salt as a control measure for endemic goiter, and recognition of the continuing and sometimes changing problems of such diseases as infantile beriberi. WHO's efforts to stimulate interest in cereal enrichment for control of pellagra are reported, as is the organization's interest in and recognition of need for control measures and better understanding of widespread anemia in various parts of the world.

About four years ago, Dr. Richard W. Vilter did a study for WHO of pellagra and anemias in Egypt. Last fall in Geneva WHO convened a study group on anemias with Dr. Vilter as chairman. At the end of the session a smaller group worked to outline a research program in the field of anemias which it felt WHO might encourage. This program is now underway.

WHO, with the Food and Agriculture Organization, established a program on food additives. Originally placed in the Pharmacological Section of WHO, the study has been transferred to the Nutrition Section.

Unlike FAO, which is centrally operated with direct relationships between Rome and activities in the various countries, WHO operates on a regional basis. WHO's central staff in Geneva is advisory or expert, while the operating offices are regional in level. WHO hopes to place nutritionists in regional offices where there are now no nutritionists.

As an outgrowth of the $300,000 grant from the National Institutes of Health, WHO has held two meetings to outline general guidelines for research planning and to define the role of WHO in research. WHO has also convened groups to deal with smaller facets of research identifiable as a particular interest. For example, when the Protein Advisory Group met in Geneva in March, all present for that meeting also served as a portion of a continuing group which worked for several days to formulate guidelines for nutrition research in WHO. The report from the nutrition group will be brought together with the reports of the other groups in other fields. These reports are to serve to define the role which WHO should or may serve in research in the respective subject areas, and thereby provide the basis for planning a research program within WHO. It is believed the program which will evolve will have to do largely with administration, with coordination, stimulation of work, and perhaps deal with problems where standardization is especially important. The nutrition group felt WHO, as a worldwide organization under the United Nations, could provide a peculiarly helpful role in standardizing methods, techniques, and terminology in order to better compare research results.

WHO has in preparation a monograph on goiter. A major part of this has been published recently in the WHO Bulletin.

There are plans for a special study conference, like the Princeton and Jamaica conferences, to be held in Mexico at the time of the Fifth International Congress. The study conference will be sponsored by WHO, FAO, and the Macy Foundation. This conference is to deal with the question of how to change food habits and promises to be one of the more important developments in translating research findings into practice. The proceedings will be published.

* * *

Dr. Louis Verhoestraete, Chief of the Health Promotion Branch of the Pan-American Sanitary Bureau, recognized the interest of the Board and participation by many of its members in affairs of the World Health Organization and of the Pan-American Health Organization. Dr. Verhoestraete commended also the interest and assistance to WHO from the National Institutes of Health and the International Cooperation Administration.

The Pan-American Health Organization is the regional organization for WHO and the Pan-American Sanitary Bureau, established in 1902, is the executive arm for WHO in the region of the Americas.

The developing practical research fields in WHO will be coordinated with programs of FAO and the United Nations Children's Fund (UNICEF). More consultants will be sent to the regions.

The region of the Americas is fortunate in having had a nutritional advisor for many years, Dr. Nevin S. Scrimshaw, Director of the Institute of Nutrition of Central America and Panama. In another two years this region will have three or four additional consultants in nutrition. Fifteen countries in the Americas have integrated health projects which help the countries develop basic health services. Nutrition is to become a stronger component in these projects with emphasis on maternal and child health, the latter in terms of infant and child nutrition. WHO's expanding program and the Pan-American Health Organization's program should be able to do a tremendous job because of the endless possibilities to go fast and far in demonstrating some of the phases of nutrition. Other agencies will also be working in the same region so the next five years should show great progress in the Americas.

Dr. Richard Vilter was asked to describe work on the problem of nutritional anemias. He said the delegates meeting in Geneva from most of the underdeveloped areas where nutritional anemias constitute one of the major public health problems were excellently informed on the subject. A summary of recent pertinent literature was available for the meeting.

At the meeting the group pointed out that blood-loss anemias are of major importance, the others minor. It noted indices which should be followed in the various areas in order to determine the extent of the problem. Methods were discussed that should or could be used in the field for investigation of the problem, and methods that were at present available to overcome it, and the group emphasized the need for enrichment of cereal products with iron in various forms. Finally, from what is known, the committee attempted to point out areas which might be investigated further because more information is needed. For example, in the tropical regions it appears that diets may contain as much as 30 to 45 milligrams of iron and yet, even in areas where hookworm is not a major problem, iron deficiency anemia may exist to a considerable extent. The reasons for this are not known, though there are theories.

In areas where hookworm anemia is prevalent, six milligrams iron supplementation per day in a cereal product will raise the average hemoglobin level of the population in a six to nine months period from six and one-half to seven grams up to ten and one-half to eleven grams without doing anything to the hookworm at all. Without a great deal of additional iron, this is an appreciable accomplishment.

Dr. Vilter's comments brought to a close the reports on nutrition in international programs.

REPORT ON ACTIVITIES OF THE COUNCIL ON FOODS AND NUTRITION, AMA — E. H. Stevenson

Dr. Philip L. White, Secretary of the Council on Foods and Nutrition, is in Peru on one of the ICNND's nutritional surveys. Dr. C. A. Elvehjem has resigned from Council membership since the fall meeting of the Food and Nutrition Board, and Dr. Robert Olson has been appointed in his place.

The Council's statement about the use of "Vitamin Preparations as Dietary Supplements and as Therapeutic Agents," was published in the January 3, 1959 issue of the Journal of the American Medical Association.

Ten fellows have been selected for the second year of fellowships awarded in clinical nutrition. This activity is sponsored in cooperation with the Nutrition Foundation. The Goldberger Award in clinical nutrition is also given in cooperation with the Nutrition Foundation. The recipient has been selected and the award will be presented at the Atlantic City meeting of the AMA in June.

Three symposia are in the offing. On May 8, the Council is conducting, with Vanderbilt University, a symposium on the overall topic of nutrition in medicine. Next fall is the symposium on infant nutrition to be presented in cooperation with Cornell University's School of Medicine. In a forthcoming issue of the AMA's Journal there will be a written symposium on the significance of lowering blood cholesterol levels. The Council has invited five persons with differing viewpoints to write on this subject. These viewpoints will be presented for the information of the physician, but no conclusions are attempted.

* * *

DINNER MEETING, FRIDAY, APRIL 3

At the dinner meeting, Dr. William J. Darby reported to the Board and its guests on the survey in Ethiopia, one of the ten surveys to date sponsored by the ICNND. Dr. Darby showed color slides of the topography and people in Ethiopia, work by the team, and deficiency diseases prevalent in Ethiopia. Dr. William J. McGanity of Vanderbilt University, and Dr. Les J. Teply of the Wisconsin Alumni Research Foundation, members of the Ethiopia survey team, commented on their part in the survey.

* * *

The meeting reconvened on April 4, with Dr. Grace A. Goldsmith, Chairman of the Board, presiding.

Dr. A. E. Schaefer, a member of the Office of Civil Defense Mobilization Ad Hoc Advisory Group on Research and Development for Food for Shelters, had circulated among Board members for comment proposed nutritional standards

for shelter feeding for (1) bare survival of 2 to 8 weeks, (2) austere rations, and (3) near-normal allowances. With acceptable nutritional guide lines, suitable foods for longterm storage might be stockpiled and plans established for space, equipment, and facilities in shelters to feed the occupants.

Discussion centered around the question as to the adequacy of 1500 calories suggested for survival. Dr. Schaefer explained that the 1500 value was minimum for survival and actually, 2000 calories was the goal. The allowance provides for proportionate distribution according to need among a normally healthy representative population grouping of men, women, and children. Special provision would be made for pregnant and lactating women and infants, and for sick or injured individuals. The practicality of food and water storage in minimum space together with conditions of waste disposal and physical conditions had to be considered. While sentiment favored pressing for a higher calorie allowance, there was also noted the sedentary nature of confinement and the possible tranquilizing effect of insufficient energy. Dr. Darby considered provision of more vitamin C to be needed. Note was taken that provision of extra vitamin A was not required for the short-time period.

The question of quality of protein in cereal products was mentioned, as was the possibility that stockpiling could relieve current agricultural surpluses. In consideration of ingredients of rations, Dr. King cautioned against including items, such as soybean products, which develop revulsion upon extended consumption.

Pursuant to the discussion a motion was APPROVED to the effect that:

The Board gives preliminary approval to the proposed Standards of Nutrition for Shelter Feeding as set forth in Dr. Schaefer's memorandum of March 18, 1959. Insofar as possible, the plans should aim at levels higher than the bare survival allowances. The proposed upper levels for "austere" or "near-normal" allowances are satisfactory. The minimal 1500 calorie level should presuppose a situation where there is no demand for physical activity or extra energy expenditure and should not be extended beyond a few weeks.

* * *

At the last meeting of the Board (Proceedings, Volume XVIII, page 46), the Chairman was instructed to explore how the Board could best participate in planning and guiding international programs in nutrition. This matter had been further discussed by the Executive Committee. Dr. King summarized by indicating that in view of the broad responsibility under NAS-NRC representing scientists in international affairs, a Board committee might be helpful in working with both national agencies and international organizations on international programs involving food and nutrition. Dr. Maynard noted that many Board members are already serving in various international programs and organizations, and that a Board committee could well serve to strengthen this service. Dr. Sebrell cited yesterday's program as an example of the developing

appreciation of all the ramifications of nutrition centered in many different government agencies. The best possible basic knowledge is needed in the area in order to arrive at sound judgment and effective programs. Dr. György counseled for close liaison with the U. S. National Committee adherent to the International Union of Nutritional Sciences. Pursuant to the discussion, the Board APPROVED authorizing the Chairman to nominate a committee for appointment by Academy-Research Council officials.

(NOTE: Dr. Goldsmith, upon advice of the Executive Committee, submitted the following names for appointments to the Committee on International Nutrition Programs: L. A. Maynard, Chairman; members, Drs. W. J. Darby, C. G. King, W. J. McGanity, F. J. Stare, L. J. Teply, and W. G. Unglaub. Liaison with government agencies were to include: J. M. Hundley, NIH; A. C. Curtis, ICA; G. E. Hilbert, USDA; A. E. Schaefer, ICNND; and J. B. Youmans, DOD.)

* * *

A letter from Dr. E. J. Lease, member of the Board's Committee on Cereals, was cited suggesting that if bill S. 651 for enrichment of rice distributed under the School Lunch Program passed, the Chairman of the Board might write to encourage the President to sign it. Dr. Sebrell suggested the letter, if sent, be signed by Dr. Detlev W. Bronk, President of the National Academy of Sciences. Dr. King suggested calling attention to the Board's resolution which established the principle on which the bill is based (Proceedings, Volume XVIII, page 36). The Chairman of the Board and the Chairman of the Committee on Cereals were authorized to follow up on this matter.

* * *

Although the revision of the recommended dietary allowances will take several years, the immediate need to begin a re-evaluation of calcium allowances was recognized. The Board therefore APPROVED a recommendation of the Executive Committee that a Subcommittee on Calcium Allowances under the Committee on Dietary Allowances be established with Dr. R. E. Shank as chairman.

* * *

It was suggested the Board should give attention to ill-effects, if any, of excessive protein consumption. The question was referred to the Committee on Amino Acids for consideration.

* * *

In regard to the nutritional studies at Elgin State Hospital, the Board authorized the Chairman to send the following letter to Dr. Daniel Haffron, Superintendent of the Hospital:

FOOD AND NUTRITION BOARD

Volume XIX, page 35

April 6, 1959

Dear Dr. Haffron:

The Food and Nutrition Board at its meeting April 3, 1959, heard about the most recent results of the Nutritional Studies at the Elgin State Hospital from Dr. M. K. Horwitt. It had also a report from its committee which met with you January 18, 1959.

The progress that has been made in these studies is most gratifying. Basic information, particularly in regard to the metabolism of fatty acids and viatmin E, has been obtained which is of great importance for a clearer understanding of the impact of dietary factors on health. This information has particular significance for mental health and normal brain function, since fats and fatty acids are major constituents of the brain.

The Food and Nutrition Board is gratified with the current accomplishments and wishes to thank you for all the help you have given Dr. Horwitt and his associates. It is looking forward to even more fundamental results in the future.

Sincerely yours,
Grace A. Goldsmith, Chairman
Food and Nutrition Board

* * *

A question, originating from the National Institutes of Health, was put to the Board as to whether, if funds were provided, the Board could serve to arrange for procurement and distribution of pure fatty acids for research work. Various kinds of fatty acids were being prepared in many places throughout the world and the need for a central procurement and distribution center was clearly indicated. The problem was thoroughly discussed, but in view of the lack of staff and facilities to certify samples, prepare aliquots, and select competent research centers or personnel, the difficulties as a NAS-NRC activity were recognized. A motion was APPROVED to the effect that the Board urges continued exploration of ways to implement the program, and that the Board is willing to assist in any way it can, but because of the operational problems, the Board believes it can best serve in an advisory function. There are organizations with laboratories and staff facilities that perhaps could be engaged for this purpose and, if necessary, the Academy-Research Council might serve as an intermediate contractor.

October 30, 1959 was agreed upon for the next meeting of the Board. The present meeting adjourned at 11:30 A.M.

Grace A. Goldsmith, Chairman
LeRoy Voris, Executive Secretary