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# QUARTERLY CONFERENCE

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# Executive Officers of State Institutions

WITH THE

# STATE BOARD OF CONTROL

February 2, 1909

## SUGGESTED PLAN FOR STANDARDIZING THE DIETARY OF THE STATE INSTITUTIONS OF MINNESOTA.

BY GWENDOLYN STEWART, DIETITIAN UNIVERSITY OF ILLINOIS.

Dr. Rogers has asked me to outline for you a plan for establishing" a standard dietary table for some of the state institutions of Minnesota, somewhat on the plan of the Austin Flint tables in New York. This .-seems at first a very difficult task, as diets should, as a rule, be adapted to the age, activity, nativity, etc., of the consumers; yet here we have consumers of all ages, nativity, and present and previous conditions of health. Perhaps, if we may truly regard all people who have transgressed the laws of the state as being not in normal health, we may at least class all these consumers as patients; and yet in the same institutions are the employes and staff who are in general considered as being in normal health. Fortunately, however, some previous studies have been made in which the difference has been allowed for. It will no doubt be well for us first to briefly review some of the work that has been done toward standardizing the diet in institutions, even though wc may be sure that some of you arc quite familiar with these studies.

In the preparation for this discussion two investigations have been brought to my attention, both of which have been undertaken by the United States government through the work of the office of experiment stations. The first, already referred to. was an investigation of the New York Asylums for the Insane, begun in 1897. The other was made at the United States Government Hospital in Washington, D. C., in 1902-3. Both of these

studies were under the immediate direction of Dr. Atwater, at that time chief of nutrition investigations of the United States government. The results of these investigations may be secured as follows:

Annual reports of the New York State Commission of Lunacy for the years 1897-1898, 1898-1899, and 1899-1900. By application to the State Commissioner of Lunacy, Albany, N. Y.

United States Department of Agriculture, Office of Experiment Stations Bulletin No. 150. By applying to the Superintendent of Documents, Union Building, Washington, D. C, and inclosing 15c for cost of the publication.

These publications are of very great interest and contain many helpful suggestions with regard to institution management irrespective of directions for making similar studies. Dr. Atwater was intensely interested in the work, and had gathered about him a most earnest and loyal band of workers, many of whom are still active in nutrition investigations, though the appropriation lor similar extensive work has been recently denied to the department.

to Dr. Atwater there were two great gains to be made from such study. First, through learning the needs and tastes and requirements of the different classes of patients, better physiological gains could be made in the care of the patients. Second, the expense of feeding the patients and maintaining the dietary department could be very materially lessened through the intelligent and scientific administration of affairs. It was found, in general, that the food actually consumed by the patients was not far from the standard already established for such class of consumers, but it was also found, on the other hand, that the amounts provided were in many cases quite far in excess of the amount required, thus entailing a much greater expense in the commissary department than necessary. Another source of waste to the management was brought to their attention through these studies, and that was the small use made of materials which had been prepared in excess of the need at any one meal. This latter defect was in part remedied when it was suggested that a greater variety might be gained by the use of these "left overs." The first defect was also in a measure overcome upon the recommendation that more care should be used in apportioning and in serving the food in the dining rooms or wards. These studies were undertaken • in a most helpful spirit, Dr. Atwater repeatedly expressing himself as not being in any way a critic of the methods employed, but merely an interested co-worker who was devoting his energies to bringing the attention of all classes of people to "the value and nutritive cost of foods."

As Dr. Atwater has said, the main points to bear in mind in providing for the diet of institutions are as follows:

New York State Commission of Lunacy, Eleventh Annual Report, 1898-1899. Chapter 9, Page 190. Report on Dietaries, Atwater.

]. More definite information as to the actual requirements of such a population for nutriment. Basis of a dietary standard.



2. Improvement in the methods of selecting, cooking and serving the food. Improvement must be gradual; not only in the improvement of the dietary from the standpoint of the welfare of the hospital population, but also to the lowering of the pecuniary cost. Study of amounts of food actually eaten by the hospital population and a comparison with the amounts purchased and with those served on the table. Amounts provided exceed the amounts required.

1. The physiological demand for nourishment, which should be the basis of a dietary standard for the hospital dietary, can be found out only by actual observation and experiment.

2. The actual food supply must be in excess of this physiological demand, the difference between the two being found in the inevitable shrinkage and waste in the store room, kitchen and dining room.

3. The actual shrinkage and waste are much larger than commonly supposed. They can be reduced by improved methods, especially in those of cooking and serving the food. (In modern growth since then many improvements have everywhere taken place—in the manufacture of foods with a smaller share of waste, in the adoption of machinery in preparation, as the potato-paring machine, etc.)

4. In like manner the food may be made more attractive to the eye and the taste, more nutritious, and better adapted to the special wants of patients of different classes. (This is an important point and one in which more satisfaction may be given and at the same time less expense incurred. Some classes of people do not care for large quantities of heavy foods and would be happier with a light varied diet of the cheaper cereals and fruits.) Not a complaint against present management, but merely a general rule of procedure. (Atwater emphasized this point very much—not condemnation but merely helpful criticism.)

Having seen in this brief sketch the value of definite scientific methods applied to the study of the dietaries of institutions, we may consider how you may in the State of Minnesota profit from these studies. When the second study was made on the insane in Washington comparisons with the results previously obtained in New York were most valuable, and in the same way studies on the institutions of Minnesota would gain much by comparing results with those in New York and Washington.

In the effort to really bring you some definite scheme of procedure I have outlined the following plan:

Place in each institution, or at least in each town containing institutions, a trained, intelligent dietitian, one who is a graduate of one of the best technical training schools in Domestic Science; as Pratt Institute, Brooklyn, New York; Simmons College, Boston, Massachusetts; University of Illinois, etc. Pratt Institute and Simmons College both make a specialty of training workers for just such work. As your institutions are large, with varied classes of patients, I would suggest securing dietitians who have already had experience in this work. Perhaps the best material might be secured from the Department of Public Charities, New York City,

where a special department of dietitians is maintained, with Miss Florence Corbett as head dietitian. In the Metropolitan Hospital of New York and the other public charitable institutions pupil dietitians who have had thorough training in Domestic Science are taken on probation for one year. They are required to pass a civil service examination before securing permanent positions. While this will add an expense to each institution of from one thousand to perhaps fifteen or sixteen hundred dollars a year, and while I have noticed in looking over the last biennial report of the State Board of Control that each institution has many crying needs from which each humbly petitions to be relieved every two years, still I firmly believe that the additional expense would soon be covered by the saving in waste through the intelligent supervision and minute attention which such an officer would be able to give. Like Dr. Atwater, I would not want this to be taken in any sense as a criticism, for, as you know, I know nothing about the institutions here except so far as 1 have read the reports in the biennial report for 1904 which Dr. Rogers kindly sent me. 1 am speaking merely on general principles and on the light and strength of observations and experiences elsewhere. I noticed that in the report on the investigations in the hospital for the insane in Washington the work of the dietitians there is spoken of in high terms, and that it is mentioned that the food was served more attractively and that more attention was paid to seasoning and palatibility than in most institutions of that kind. As the institutions for the blind and the deaf are in the same town, one dietitian would do for both.

Having provided each institution with a dietitian who can give individual, intelligent, scientific attention to, the dietary needs of each institution, the next step would be to form a definite plan for deciding on the standard dietary table desired. As emphasized so often by Dr. Atwater, the great and first principle of dietary tables is to find the physiological needs of the body of people to be supplied, and then to adopt them to the pecuniary standard of the institution and to the personal idiosyncrasies, as far as practical, of the consumers. As the physiological needs—using the term in the largest meaning to include the physical and psychological needs, as well as the strictly physiological needs, of the consumers differ in some cases markedly in different parts of the country, and as the inmates of the Minnesota institutions must, on the face of it, differ largely from those found in New York or Washington institutions—for instance, the foreign element in New York would be drawn more largely from the central and southern parts of Europe, and that in Minnesota from the northern parts of Europe, sections having largely different tastes and customs in the matter of diet—it would be more desirable and even necessary for Minnesota to first undertake a series of investigations similar to those reported in New York and Washington in the hospitals for the insane and the Craig Colony for Epileptics in New York, and for the other institutions similar to those carried on in Europe, as in Scotland in the prison dietaries.



In order that this work may be done with the greatest profit and with not too much delay, I would suggest the appointment of an expert in nutrition, who should have the work for the entire state in charge and who would be able to direct and to co-operate with each of the dietitians in each of the institutions concerned. Such a person, if possible to secure, should be someone who has already had experience in this work in order that expense might be saved by quick and accurate methods in calculation. This expert need not be employed as a permanent employe, but be engaged simply for this investigation. In looking for such an officer 1 should judge that the best material might be secured through the Nutrition Department at Washington. If they are not able to supply one for this special work, I would suggest applying to the Schools of Civics and Philanthropy in Boston, New York, Chicago, and St. Louis. The students in these schools are trained in carrying on just such investigational and statistical work. Dr. Graham Taylor, of the Chicago school, in recent addresses at the University of Illinois stated that the United States government was drawing on their school in Chicago for trained investigators to carry on special work in Washington. Information of this school can be secured by writing to the Chicago School of Civics and Philanthropy, 47 Adams Street, Chicago. No doubt many of you are already familiar with the school and its graduates. While this work would require an expert investigator, it should also be some one who is familiar with the work in dietetics. It may be that a graduate of one of the technical schools mentioned may have also taken the work in one of these schools of civics and philanthropy, with possibly some practical work as a dietitian. Such training would be ideal for the work required; but if, as 1 believe the demand at present is greater than the supply, no one can be secured with such training, then one of the dietitians who has had some work in similar institutions no doubt would be able to undertake the work with great satisfaction.

Having now secured an efficient corps of workers, and having secured the hearty co-operation and interest of each superintendent and all other officers who would be more or less connected with the work and who would, I am sure, lend their hearty aid in every way possible, investigations could be readily carried on, as they were in the institutions referred to, until it is determined just what the present status of the patients is; and, in comparison with what they seem to want and what they actually eat with relish and what is provided, it will be possible to make an intelligent adjustment, if any is necessary, between the food consumed and the food provided; and if there are any leakages the holes can be discovered and stopped up by the most approved methods. According to Friedenwald and Ruhrah, after the investigation in the Washington Hospital, the expense of feeding the population of the hospital was reduced $2.19 per capita, notwithstanding the rising price of food. The patients are better fed and the diet is such as is best suited to their condition and surroundings. If we have time, perhaps you may be interested in hearing in detail just

how such an investigation might be carried on, though those interested are probably familiar with the work, and others can learn all the details in the publications mentioned above.

Food, as you understand, is eaten for two purposes; first, to build, up and restore the tissues of the body; and second, to supply the fuel with which to run the body machine. Food is made up of animal and vegetable tissue. These tissues are divided into five classes of nutriments: Water, mineral, protein, carbohydrates, and fats. The chemical elements contained within them all are C.H.O. and minerals, and, in addition ,the proteins contain N. This fact sets the proteins in a distinct class, for it is the food-containing. N that can alone build up and restore tissue. It is important, therefore, that the proper amount of protein should be supplied in order that the first great function of the body may be maintained. An investigation to find the physiological needs must therefore contain an estimate of the amount of protein contained in all the food. Certain foods, particularly the animal foods, are richest in the content of N. By knowing the chemical composition of the foods the amount of N consumed can be roughly estimated and controlled. The fuel is furnished in the greatest part by the C and O. These elements are most abundantly furnished by the starch}' foods and sugars, classified as the carbohydrates, and by the fats.

In order to find how much food is consumed, the total amount of food purchased must be estimated and divided into its nutritive elements as expressed by the protein, carbohydrates and fats. The amount of loss in preparation and cooking and serving is recorded. The difference betvveen the amount served and that actually consumed is also estimated. In Washington all food was classified and weighed between the kitchen and the dining room.

To estimate the fuel value of a food the power of the food to give heat is expressed in calories. For each gram of fat 0.3 calorics are allowed For each gram of carbohydrates 4.1 calories are allowed; and for each gram of protein 4.1 calories are allowed. The total gives the total number of calories or fuel value of the food. A calorie is the amount of heat required to raise one pound of water through 4 degrees Fahrenheit.

It is not necessary to estimate the chemical contents of each food as this has been done by the United States government and published in Bulletin 28, which can be secured for five cents. Indeed, it would not be necessary to even calculate the value of certain dishes as this has been done in the New York report, and many of the same dishes could be used with advantage. Not only are the estimates for the dishes given, but recipes are published by the Lunacy Commission which could be used in the preparation of the diet and thus save further calculation so that when the amounts are known the calculation can be easily made. Certain standards have been made through former investigations as to the amount of protein necessary and the amount of calories per day—per man in certain classes of activity—and the relation that this standard man bears to other men, women and children, as follows:



Method: Determination of kinds, amounts and nutritive values of food material consumed by a person or a given number of persons during a certain number of days.

Ratios:

| | | |
|---|---|---|
| Man at ordinary muscular work | Standard | |
| Man at heavy muscular work | 1.2 | times as much |
| Man at light muscular work | .8 | times as much |
| Woman moderatively active | .8 | times as much |
| Children | .3-.8 | times as much |

Reduce all to the man at ordinary muscular work. "Per man per day."

Observations: Advantageous to make observations of several classes of patients and employes at the same time, when, as is usually the case, they all receive their food from the same kitchen.

Weighing, recording, calculating, tabulating: Table 1. Appendix. Dietary Standard, page 191).

The physiological demands of the different classes of the population must be known. When we know the average demand per person of each of these classes and the number of persons in each class in the whole population to be fed, we can compute the average demand per person of that population. A proper allowance for the food supply should provide for this demand and, in addition, an amount would represent the dietary standard upon which estimates and purchases should be based.

Shrinkage: Loss in vegetables by torage, decay, loss in nutriment, etc..

Waste and Refuse: Refuse, unusable material, bones, gristle, egg shells. Waste, food prepared but not eaten, left on plate.

Kitchen Waste: Carelessness in preparation.

Dining Room Waste: Lack of fitting portions to individual appetites and tastes. When food is well cooked and tastefully served is it much more apt to be economically eaten and well digested than when the cooking and serving are defective.

I quote from the New York report on Lunacy: "A large part of the pecuniary economy of food and nutrition depends upon the way the food is handled in the kitchen and the dining room. I trust it may not savor too much of criticism if I venture to inquire whether the failure of the food to fit the consumer may not at times be due, at least in part, to lack of skill and care in cooking and serving."

Physiological demands of the insane for nutriment:

1. Kinds and amounts of food should be adapted to the actual physiological demands.

2. These demands differ with different classes of people.

Distinction between patients and employes and a classification of patients according to physiological demands are therefore desirable.

Test: Compare food eaten with the amount excreted. Folin-Waverly. (The doctors probably know more a1)out this now than when Dr. Atwater

Food should be nourishing, rich in assimilable phosphorus, an element that these subjects lose abundantly.

Articles to be avoided: Cabbage, pork, veal, fried oysters, lobster, crabs, salmon. Rich cakes, puddings or pies. Fruits with small seeds. If a non-uric acid-diet be necessary, exclude all meats, poultry, eggs, fish, shell fish, coffee and tea, salt and condiments.

Diet for Epileptics—Craig Colony, New York. Friedenwald & Ruhrah. Page 575.

Sunday—Breakfast: Eggs, coffee, bread, butter. Dinner: Soup, roast beef, vegetables, cornstarch pudding, custard sauce, bread. Supper: Tea, cookies, apple sauce, bread, butter.

Monday—Breakfast: Rolled oats, coffee, bread, butter. Dinner: Soup, mutton, potatoes, rice pudding, bread. Supper: Eggs Or baked potato, tea, prunes, bread, butter.

Tuesday—Breakfast: Stewed potatoes, coffee, bread, butter. Dinner: Meat stew, potatoes, vegetables, sago pudding, bread. Supper: Corn bread or mush with syrup, tea, bread, butter, apple sauce.

Wednesday—Breakfast: Rolled oats, coffee, bread, butter. Dinner: Soup, roast beef, mashed potatoes, vegetables, bread. Supper: Boiled rice, crackers, cheese, tea, butter.

Thursday—Breakfast: Eggs, coffee, bread, butter. Dinner: Soup, beef hash, boiled potatoes, bread pudding, bread.

Friday—Breakfast: Rolled oats, coffee, bread, butter. Dinner: Soup, fresh fish (baked) or codfish, boiled potatoes, stewed tomatoes, gelatin pudding, bread. Supper: Macaroni and cheese, tea, bread, butter, dried peaches.

Saturday—Breakfast: Stewed potatoes, eggs, coffee, bread, butter. Dinner: Irish stew, apple sauce, bread. Supper: Hot corn bread, tea, baked potatoes, dried peaches, butter.

Vegetables to be used: Potatoes, beets, beans, peas, parsnips, celery, onions, corn, spinach, carrots, tomatoes, oyster plant. In case of emergency the cook may substitute one article of diet for another, subject to the approval of the matron, physician, steward, or supervisor in charge of the division.

Criticism: Should have some other hot beverage beside coffee for supper, as coffee should be used sparingly. Meat soups should be excluded on account of extractives. Cookies, sweets, should be given at dinner. Syrup should not be given at night, especially not raw. Macaroni and cheese should not be given at night. Salt codfish should not be used Might substitute puddings for supper and have more sweet dishes at noon; cookies, plain cakes, dates and figs. Good points: No cabbage, no corned beef, no pork, no veal, no fried food, no rich puddings.

I should judge that one gain in a standard dietary would be that the whole supplies bought for all the state institutions would be more uniform in variety and quality. As far as the patients are concerned, I should not think that any of them would miss very much the articles which are eliminated from the epileptic diet; for instance, cabbage, pork, veal, fried foods.



With steam apparatus in the kitchens and a good supply of ovens it would very materially lessen the labor of preparation if no frying were done, besides eliminating the danger of indigestibility.

Corned Beef: In the experiments at Washington corned beef was one of the articles which was very largely rejected by the patients and consequently wasted. Why give it at all? It is an expensive meat. When served hot with vegetables it does not go very far. I found that it took about one-quarter of a pound per capita at a cost of two cents per capita for students at the rate of eight cents per pound. Of course, the institutions may corn their own beef from the coarser cuts, but then all cuts can be utilized fresh, and corning only makes additional labor.

The feeble-minded would be the next class of patients to be considered. I have not found many references to the diet of the feeble-minded. I presume that in many minds they are not much separated from the epileptics. Barr says: "Food, given liberally in a form that may be easily masticated and digested, should be rich in oleaginous and phosphatic constituents and should contain a fair amount of nitrogenous elements. Green vegetables and fruit are especially wholesome, as there is generally more or less tendency to scrofula. Simple desserts, candy, or other sweets, are, it is needless to say, best given at midday. If necessary at all between meals, food should be of the simplest; milk and bread, or a bun or fruit, always being best. In view of the fact that malnutrition, often through successive generations, is frequently at the root of the trouble, the importance of this continual building up by means of a liberal and varied dietary becomes self-evident."

The diet of the insane would have the next consideration. While there are some classes which would not need such a restricted diet as the epileptics, still, perhaps it would be just as well for the insane to do without corned beef; particularly as most of them do not eat what is provided; at least, according to the Washington investigations. The cabbage also might be well eliminated unless some are engaged in hard labor. Of course, I realize that many of the insane are apparently well and strong and do engage in heavy muscular labor. I will quote some general statements from Friedenwald and Ruhrah.

"Feeding constitutes a very important part of the treatment of the insane. All insane patients who are below the standard of nutrition should be built up and an earnest effort made to increase the weight of the patient. One of the English alienists was wont to speak of the 'gospel of fatness.' This is best accomplished by the system of feeding somewhat similar to that outlined in the rest treatment, the rest being prescribed or omitted, as the case may be. It should always be remembered that an insane person may contract other diseases besides his mental disorder, and these should be carefully sought for and properly treated. This is true especially of stomach and intestinal disorders, which may give rise to delusions regarding the taking of food.

"Children of nervous parents and those whose constitutions arc of the nervous type require careful dietetic supervision, and the child should be trained to like the plain, wholesome varieties of food and never be given rich, highly-seasoned dishes that so often disturb the digestion. Milk should form the basis of the diet, and eggs and meat should be given in moderate quantities along with cereals and the wholesome vegetables. As a rule infants should be kept on a milk diet longer than other children, and the change to a general diet should be made with caution. Tea and coffee, as well as alcohol, should always be forbidden. Every effort should be made to nourish the child, and to have him lead a wholesome, quiet, out-of-door life."

One of the most striking results of the New York and Washington studies was to find that in general the patients were eating voluntarily about the average standards of protein and calories, according to their activity. The loss was on the part of the institution in providing and serving too liberally, with consequently a great waste of food.

In the tuberculous ward of one of the New York hospitals the food cooked is estimated so many ounces per person, but in serving no attempt is made to measure, it being left entirely to the haphazard judgment of whoever may be serving, and the servers are often patients helping out. I would suggest that it might be well to have graduated measures for each dish or some dishes on the plan of an ice-cream spoon so that the amounts would be more uniform, especially tor mashed potatoes, cereals, etc.

From the dietaries provided for the insane in the New York hospitals the only articles which would have to be eliminated on an epileptic diet would be as follows: Corned beef, veal, pork, liver and bacon, sausage, salt salmon, codfish, clam chowder, and all tried foods. Surely only the laboring insane would object to the elimination of most of these.

The training schools, alter the hospitals for the insane, would require attention next. While in the majority of cases these may not be classed as defectives, still investigation is showing more and more clearly that this class of youth is more or less defective in physical as well as mental being. At the recent meeting in Chicago to consider the children of the nation, it was definitely stated that from the findings of the juvenile court probation officers, etc., the juvenile offenders were in one or more ways physically defective and that sooner or later the greater number of them would be state dependents in one way or another; hence we might have the same care in eliminating indigestible foods or foods digested with difficult}' or having constituents which are apt to cause complications, and they might well thrive on the same diet as the epileptics, varying in quantities, of course. It would be well to exclude foods containing much added salt, as salt tends to increase the thirst, and these patients do not always find water readily accessible. Fried foods certainly increase the kitchen labor in preparation and in cleansing of equipment and utensils, so it would be well to eliminate them for all classes.



1 have not seen any special discussion of the diet for the blind in these general books, though no doubt there are discussions in the special magazines and books devoted to the welfare of the blind, but I have not had time to investigate. However, these may be classed as school children in a large measure and should have the simple, wholesome, nourishing diet of children, so that this basis would do for them also.

School for the Deal: For these I may say the same as for the blind.

Inmates of reformatories: Same as mental defectives.

The inmates of prisons have received more attention, investigations having been carried on in England, Scot land and Europe. Those confined in cells certainly need some attention and a different diet from those who are laboring out-of-doors or from those who are working indoors. Prison dietaries are discussed in Friedenwald and Ruhrah, page 552, giving reports of the English, Scotch. French and Prussian systems with reference to the American standard as devised by' Atwater.

| Persons in Health Under Moderate Conditions. | | | Protein. | Calories. |
|---|---|---|---|---|
| (e) Man at hard muscular work | Atwater | (d) | 150 | 4350 |
| (e) Man at moderate active muscular work... | Atwater | (c) | 125 | 3400 |
| (c) Man at light muscular work | Atwater | | 112 | 3050 |
| (c) Man with sedentary work | Atwater | | 100 | 2700 |
| Inmates of prisons, hospital for insane | Atwater | (d) | 90 | 2450 |
| (c) Male convicts at hard work | Dunlop | (e) | 150 | 3800 |
| Ordinary male convicts | Dunlop | (e) | 120 | 3020 |
| Prisoners and inmates of house of correction | Richards | (f) | 103 | 2765 |
| Inmates of reformatories (male) | Richards | (f) | 111 | 3000 |
| (c) Unemployed male prisoners | Dunlop | (e) | 90 | 23S5 |
| Inmates of almshouses | Richards | (f) | 83 | -2435 |
| Punitive diet short duration | Dunlop | (e) | G4 | 1805 |
| Punitive diet long duration | Dunlop | (e) | 90 | 2385 |
| The insane per person | Richards | (f) | 110 | 3015 |
| The insane per person | Atwater | (d) | 78 | 2450 |

(c) Corresponding values for a woman, .08 as much.

(d) Figures represent physiological demands.

(e) Figures represent practically physiological demand, there being an extremely small allowance for waste.

(f) Figures represent ration allowance, with margin for waste of about 10 per cent.

An investigation in Minnesota would probably show that variations would have to be made on account of the climate. From the basic dietary the greatest changes would probably be additions in quantities and in meats, according to the activity of groups of each class. In each of the institutions, especially in the hospitals, there would be wide variations of certain classes, according to their state of health, age and activity. This would be especially true of the epileptics and insane.

We would then have these eight different classes of institutions to provide for on our basic diet for the epileptics, adding to it in the case of the insane a more liberal diet, especially in the case of the tuberculous

patients; planning for a liberal but simple and wholesome diet in the training school; in the case of the blind and the deaf, being for the most part intelligent, active, trained, growing youths, a rather normal diet, suitable for any well regulated boarding school; in the case of the blind giving, as far as practicable, foods easily handled and of agreeable consistency and flavor. In the reformatory would be eliminated all exciting and irritating foods, such as meat, soups, condiments, fried foods, and fatty or fermentable foods difficult of digestion and likely to cause disturbances. The prisoners, many of whom are probably in prison because of some condition of malnutrition which has twisted and warped their sensations until they have thought it was right and justifiable to break the state's laws, would need special dietetic consideration, especially those who are confined in the cells and are deprived of an unlimited amount of oxygen, which is essential for the digestion of certain foods. Their diet would vary from 64 grams protein to 150 grams, and from 1S05 to 4350 calories; employes would vary from 00 grams to 150 grams protein, and from 2450 to 4350 calories, according to their occupation and hours of duty and labor.

As has been emphasized and followed out, especially in the Washington report on the insane, each institution must have several classes of patients requiring special diets and special diet standards. The officers, staff and employes also require special attention. All these modifications must come in, and this is where the intelligence and skill on the part of the expert nutrition investigator will be valuable. The studies must be carried on, moreover, in such a manner as not to interfere with the smooth running of the machine of the institution, nor with the immediate welfare, and happiness of the patient, nor with the comfort and general satisfaction of the employes. As Dr. Atwater cautions, "All change must be gradual," and very gradual at that. Mrs. Richards quotes Mark Twain as saying. "You cannot throw Habit out of the window; it must be coaxed down stairs one step at a time."



## THE PER CAPITA BASIS FOR FOOD ESTIMATE FOR STATE INSTITUTIONS.

DR. G. O. WELCH, SUPERINTENDENT FERGUS FALLS STATE HOSPITAL.

Food is required by the body for two main purposes: To provide for the growth and repair of the various structures that make up the human organism, and to furnish vital energy for the work to be performed. Certain chemical combinations containing nitrogen, known as the nitrogenous foods, or proteids, with the assistance of some mineral matters, salts and water, furnish material for both purposes, but more especially for new-growth and repair of tissue, while other chemical compounds composed of carbon, hydrogen and oxygen, provide the material from which the vital energy is principally elaborated. These latter compounds are starch and sugar, known as the carbohydrates and fat.

It needs to be borne in mind that the digestive apparatus is not simply a chemical machine that will grind up and turn into food whatever material is offered it. The digestive tract is a tube open only at the two ends. It matters not the amount of bulk put into this tube; every substance eaten must contain at least one of the chemical compounds mentioned in the preceding paragraph, and this must be so combined with the material in which it is found that the digestive secretions can extract and liquify it before it can pass through the walls of the tube and enter the body itself, and there serve the purposes for which it is intended. The most ideal food material may, however, in many cases prove valueless, for if any portion of the digestive tract, on account of injury or disease, fails to perform its part in the digestive process, the nutritive elements may not be extracted or properly acted upon by the intestinal secretions so that they can be taken into the system, in which case they simply become waste matter and are eliminated from the digestive tube as such. Individual peculiarities may frequently have the same effect upon the food eaten, and individual taste must often be consulted, especially with the sick, or the nutritive elements may not be absorbed from the digestive tube in sufficient quantities to furnish the required nourishment. Although these points are applicable to a special rather than a general dietary. I mention them here because 1 think that in planning a dietary for an institution we are too apt to overlook individual needs, and, as a result, find from time to time that some of the inmates are wasting away, apparently for no good reason, but in reality because they are not receiving just the kind of food they are able to digest and assimilate. The diet may be ideal from ft chemical standpoint but fail utterly to nourish a body in which functions are not normal. •