

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 1805 to 4350 calories; employes would vary from 90 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 I 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 a chemical standpoint but fail utterly to nourish a body in which functions are not normal.

By careful analysis the chemist has discovered the amount of each of the nutritive elements that is present in the various articles used as food, and prolonged experiments have settled pretty definitely the amount of each required by the human body under various conditions to supply the demands of growth and tissue repair and to maintain the individual in a normal and healthy condition. Scientific investigation has further proved that the changes which food undergoes in the body is one of oxidization, or combustion. Heat and energy are convertible terms, so that the amount of heat produced by the combustion of food gives the value of the food as a producer of vital energy. The standard of heat production in the body is called the calorie; that is, the amount of heat required to raise one pound of water four degrees Fahrenheit. To supply the various demands of the body requires the daily consumption of from seventy-five to one hundred and fifty grams of nitrogenous food, or proteids, two hundred and fifty to five hundred grams of carbohydrates, or starch and sugar, and forty-five to one hundred and fifty grams of fat. The food eaten should contain sufficient potential energy or be able to produce heat amounting to from nineteen hundred to four thousand calories. These figures are minimum and maximum. The actual amount of nutritive material required per individual depends, of course, upon age, sex, and amount and character of work performed. It is to be borne in mind that proteids are a source of vital energy as well as the other food elements. In fact, man could live on proteids alone, but these nitrogenous compounds burn up very quickly in the system and consequently are not an economical food when used alone. The carbohydrates burn much more slowly, and the fats the most slowly of all. These two compounds have a peculiar effect when associated with proteids in that they save the latter from being too rapidly consumed, from which fact they are called proteid preservers. In order to accomplish this result and allow the proteids to be used at just the rate best suited to the bodily requirements, they must be present in certain proportions. Authorities differ as to the correct proportions, dietary tables ranging from one part fat to three parts of carbohydrates to one to ten.

It is unnecessary in a paper of this character to go into the question of nutritive ratio, balanced ration, etc., to any extent. These questions have been practically settled by scientific experiment and the results incorporated in the various dietary tables, which are to be found in any reliable book of dietetics. In making out a dietary for an institution we need simply to bear in mind that the experience of ages has proved that the proper diet is a mixed diet; that the food must not be too concentrated because a certain amount of bulk or waste matter is necessary to stimulate the peristaltic action of the intestines, that the food may be kept in motion during the process of digestion, in order to be properly acted upon by the digestive fluids; and that the inmate who does no work requires less food than one who is engaged most of the day in some form of manual labor. Disregard of this last point in making out our dietaries

is the cause, I believe, of a great deal of the ill health among our inmates, and is responsible, together with our failure to impress upon the minds of the employes that water in large quantities is a very necessary and important food material, for a large percentage of the deaths from kidney troubles.

By consulting reliable dietary tables we learn that a man doing a moderate amount of work requires every twenty-four hours approximately one-half pound of beef, one pound of potatoes, one pound of bread, and three ounces of butter. In order to make use of this in blocking out a general dietary this had best be stated in nutritive values; that is, every inmate who is doing a fair amount of manual labor should receive during the three daily meals twenty-eight one-hundredths pounds of proteids and one and one-quarter pounds of carbohydrates and fat, in proportion not to exceed three to one; and the amount of food taken should show a potential energy of thirty-five hundred calories.

At the institutions maintaining large farms the character and quality of the food served depends largely upon the farm products, so that the dietary problem is not so difficult of solution as in those institutions where all the food supplies have to be purchased. In all cases, however, it would be as well to start with some general plan. I would therefore suggest, to begin with, that a list be made of all articles to be used for food, arranging them under such headings as meats, vegetables, bread and cereals, fat, fruit, etc. Beans and peas should be classed with the meats as they contain a large amount of proteids and can therefore be used in the place of meat. Against each item can then be placed the amount of nutritive elements it furnishes and the cost per pound. From this table a dietary can easily be planned to suit the needs of the majority of inmates in any institution, and, without sacrificing variety, articles of diet that fluctuate in price can be made use of only at such times as the cost warrants.

One important point to bear in mind is the dietary habits of our inmates. People who have always eaten certain kinds of food will not be satisfied or get along as well if any radical change is made in their diet. Consequently, a general dietary must not be too rigid along theoretical lines. For the same reason *one* form of dietary for all institutions would not be practicable, for a diet schedule that exactly met the needs of one might not be suitable for any other institution. Several years ago the fruit-for-breakfast fad was tried at Fergus Falls, with the result that seventy-five per cent of the fruit sent to the dining rooms went into the swill barrel. The same fruit served at supper resulted in practically no waste. When we first began to serve lettuce and celery on the tables the patients would often speak of the enjoyment it gave them to see the pretty bouquets, but it was some years before they learned to enjoy them internally. We should, then, adapt a dietary to the habits and customs of those for whom it is prepared. By those who have been accustomed to plain, simple living, only plain, simple food will be relished and appre-

ciated, and anything beyond this is a wasteful and unwarranted expenditure of money.

In my opinion a dietary should not be based upon the per capita cost of food material, especially as we can maintain a true economy in a better way. It has been my experience that in institutions where expenditures were considered solely from a per capita point of view, parsimony was the rule and a false economy the result. I am happy to say that this has never been the case in the State of Minnesota. The keeping down of expenses is a matter of vital importance, but care in the selection and use of material has more to do with the solution of this problem than any limitation in the purchase of supplies. It is the duty of superintendents, while providing sufficient variety, to eliminate unnecessary items, to take advantage of the market by substituting cheaper articles of diet for more expensive when the former meet requirements just as well, to prevent unnecessary waste of food by employes, and, especially, to adapt the dietary to the habits and needs of the inmates, neglect of which causes the greatest waste of all, for not only does the food prepared have to be thrown away, but the well being of the inmates suffers and the aim of the institution is sacrificed. Our institutions are established for definite ends: To provide homes for those whose infirmities are of such a nature that they cannot live in the outside world, to segregate those who are a menace to the welfare of society, and, most important of all, to restore every inmate possible to a condition in which he is able to become again self-supporting and thus relieve the state from the burden of his maintenance. In the hospitals we are striving to restore to a normal, mental and physical condition every patient in whom there is a chance of recovery. In the custodial and reformatory institutions we are trying to impress anew upon the diseased or warped mind the laws of social life, that a quick return to the outside world may be possible. To accomplish this the inmates must be kept contented and happy and brought to a condition of physical health, without which no permanent improvement or reform is possible, and here the food question becomes one of great importance, for if parsimony rules and efforts are directed mainly towards reduction in per capita cost, the results will be disastrous to the main end for which our institutions were established. The superintendent who faithfully watches the distribution and use of supplies need have no hesitancy in comparing the results gained in his institution with those shown by any other in which a per capita cost alone governs the expense account.

Dr. H. A. Tomlinson. St. Peter State Hospital: Mr. Chairman: I have been asked by Dr. Kilbourne to open the discussion of this paper in his stead; and while I have been listening to the very full and able presentation of the subject-matter of the paper, I have been recalling my own experience and observation.

I am in a measure familiar with the data presented, and I have watched with considerable interest the work of the men referred to. Miss Stewart presents to us an ideal which we would all be only too glad to see realized.

This subject has been always one that interested me greatly; not only on account of its practical bearing upon the economy of our institutions, but because of its importance to the welfare of the people in our charge; but those of us who have to meet the conditions under which we work, in our public institutions, know how far we are from the realization of the ideal presented.

In all of the investigations referred to in the paper, the training and fitness of the employes who handle and prepare the food is not considered; or, rather, it is taken for granted that they are experts, both competent and willing. I have made it a matter of careful inquiry whenever the opportunity offered, and I have talked with the men in charge of the institutions referred to in the paper; and when the proper questions are asked, they admit that the success of all such efforts depends upon the character and qualifications of the employe.

As I recall, this factor was not considered by the men who made the investigations referred to by Miss Stewart; or, if it was considered, the qualification of the kitchen and dining room employes was implied: Whereas, it is the human element which makes for the uncertainty of results, and often futility, in our efforts to prepare food wholesomely, serve it attractively, and use it economically. Indeed, the very statements in the paper we have just heard admit the necessity of trained and intelligent help, and the writer recommends that such help be provided as an antecedent to the carrying out of her recommendations.

My practical efforts to accomplish reform in the preparation and distribution of food make me sympathize with the dictum of Sydney Smith to the effect that: "The Lord made the food, but the Devil made the cooks." In our large institutions, where the patients help with the domestic work, only the most demented and incompetent can be induced to work in the kitchen; while, because there is so much to do, a great deal of the work that requires skill and intelligence must be left to them; so there is the tendency to reduce the character of the work done to the level of the capacity of the demented patient. I know it is presumed that the superintendent should enter as a factor in this, as well as the other departments of institution work; but his time, as well as his capacity, is limited, and he can, to a small extent only, supplement the lack of intelligence and training on the part of his kitchen employes.

I believe from my own experience and observation that the methods described by Miss Stewart could be successfully carried out in our institutions, but they cannot be carried out by unintelligent or untrained employes. I am glad to note that Miss Stewart referred to the importance of having in every institution a dietitian who had received training in food values, food economy, and economy in distribution. That kind of training can not be obtained in a farm house or a country hotel. I believe, too, that the temporary employment of a general expert, with practical experience, would be of great advantage, but she must be a real expert, whose efficiency is the result of thorough training.

I have found by experience that sameness in the dietary is not so much the result of lack of materials as lack of time in which to prepare them. Every variation from the routine takes time, and that is why we have meat and potatoes so often. Another factor enters here, which I find very important as affecting the training of nurses in sick-diet cooking. Most of them look upon the work in the diet kitchen as manual labor merely, to be done mechanically and put out of the way as soon as possible. They have neither pride nor pleasure in the result.

There is another difficulty which we have experienced, which is the limitation of supplies in accordance with our income. In order to provide for variety in our meals, it is necessary to have a sufficient quantity of a great many things on hand at the same time so that changes may be easily, quickly, and economically made. We know that in all large undertakings those most successful are the ones who have the greatest variety in sufficient amount to draw upon to meet emergencies.

We are told that the average housewife in France would make a palatable meal from what the American housewife throws away, and I believe that this tendency goes a long way toward explaining food waste in public institutions. I have been often criticized by the relatives of patients whose dietary was limited for medical reasons, and even my own nurses revolted at one time because I wanted to substitute a wholesome nourishing soup and porridge for solid food which the class of patients involved did not appreciate and bolted without chewing. Where a great many of them eat together it is impossible to control the mentally defective, either as to the amount of food they take or as to the way they eat it. I have often, in going about the dining rooms during meal time, found one patient not eating and his food being taken by the patient next to him, or else a feeble patient having his share taken away by his stronger neighbor.

When it comes to the preparation and the serving of food to the sick, I believe that general rules do not apply. The method of cooking and the manner of serving are as important as the provision of the food: and they must be individual.

My experience has been practically the same as that of Dr. Welch with regard to the serving of food in our large dining rooms. You can't teach old dogs new tricks! Persons come to us with fixed habits and tastes, and, when they are no longer physically ill, they will revert to the ways of eating which they had at home.

While I am just as much interested in this subject as I ever was, and appreciate even more fully the importance as well as the advantage of a properly balanced dietary, I have found out by experience that if a thing is to be well done there must be some one who knows how to do it. I attend every year a considerable number of gatherings of different kinds, national and local, and I have found, both from observation and the statements of others, that results that are worth while are obtained by those only who know how. I believe it to be equally true that in the

selection of a dietary, the preparation and serving of food, and its economical distribution, it is essential that the person who is supervising this work should have been thoroughly trained, and have had experience in the training of others. In private enterprises, carried out on as large a scale as are our public institutions, work requiring skill and judgment is not put into the hands of or in the charge of unskilled laborers. It is always difficult to appreciate indirect cost, and it is hard to realize, until you have had the opportunity to see for yourself, the lack of economy in the preparation and distribution of food by untrained help.

Dr. A. E. Kilbourne, Rochester State Hospital: The one great need is some thoroughly competent person to visit the institutions and show our very willing cooks how to cook and serve food. It is not a question of inability of our cooks to properly cook and serve the food. They are able to do all that, but they have come up from the ranks, from helpers to head cook in the institution in which they have served for many years, never having been outside of the institution, and all they need is to be shown how to properly cook. They have the brains and the ability, and there is no one so competent to carry on the department as one you have yourself trained in your own institution. It would be a saving of food if we could get the proper person; it would be beneficial to the health of the patients.

Those of our institutions that have sick wards where food is served for the sick are especially in need of such service, of good service, and the nurses, while willing, don't know how to serve the food, and I am going to send a woman down onto that ward to see that food is properly and invitingly served. They are all willing to learn; they are all capable; but they simply need teaching; and I think it would be a great step to have a competent person to go around to the different institutions and take up that work.

Miss Stewart: I understand that, instead of having a dietitian in each institution, you would have just one who would go around to all institutions in the state.

Dr. Kilbourne: I should prefer one who would go around rather than have her in the house constantly. If my own people are trained they will get along better. Let them depend upon themselves to carry it out. I propose to train my cook to be the dietitian. If we can get a dietitian for all the institutions and can't get one for each, we will take the one. It is a poor cook that can't be taught by that dietitian what to do. A good cook can learn all that is needed from that dietitian, and if he has any brains there is no reason why he should not learn and be just as capable as to have a dietitian constantly present. If he can't do that, he doesn't amount to much. He has to do the cooking, anyhow, and if he doesn't do it right, the dietitian simply calls attention to the fact that he has spoiled a lot of food. Her presence won't prevent it. If he is going to spoil food, he will spoil it, whether she is there or not.

Miss Stewart: The trouble is that the cook is in the kitchen and stays there and doesn't know what happens in the serving room. The dietitian will have very little to do with the cook. Much of the trouble is in the serving. It requires one person to look about and see the whole thing.

Dr. Kilbourne: If you want an overseer it would be proper, then, to have some one ill the institution constantly. It is something that the institutions need very much. The food is not properly served.

Dr. A. C. Rogers, Faribault School for Feeble-Minded: I have been very much interested in the whole dietary problem for some time because we are just in the stage of transition from the preparation of food by a great number of rather indifferent cooks to its preparation by one head cook.

The dietary work of today involves two classes of experts: One who knows how to combine and cook food elements—that is, is able to do it; and one who knows theoretically how it ought to be done. The latter knows the food and heat values; the former knows how to please the palate, but may or may not give a full equivalent in food value for the cost. That is where an expert dietitian has a field in our institutions, even though the latter may not be a practical cook.

In our own work we have for some time had a dietitian whose special function has been to prepare bills of fare, to see that the food as served was in proper condition, and to make report on same. That work in itself involves one person's time completely, and we have found that it has helped out the situation immensely. If any of the food is very improperly prepared, we find it out at once. If there has been issued any food of improper quality when it came from the storeroom, which fact has been overlooked by the steward, the dietitian is the one to learn of it first, and to see that the mistake is not repeated.

This matter of the waste and rejection of particular articles by inmates is one of the most important things that has been brought out this morning. This is another field for useful work for a dietitian. I think a dietitian should perhaps put in a third of her time at the tables, getting acquainted with the peculiarities of inmates, learning what they select and reject, etc.

I have had some experience similar to that of Dr. Tomlinson, where greedy patients would deprive two or three others of their allowance. All these things deserve close attention.

WORKING OF THE PURE FOOD LAW OF MINNESOTA.

BY MR. E. K. SLATER, EX-DAIRY AND FOOD COMMISSIONER.

Mr. Chairman, Ladies and Gentlemen: I don't know where to begin and much less where to stop in discussing this question. If I could talk cow or creamery to you I should feel a little more at home than in the discussion of this subject this afternoon. This is a sort of an echo of the past, so far as I am concerned.

With your indulgence I will try to call your attention to the work of the Department, and in doing this I want to refer from time to time to the several samples of adulterated food that I have here on the table. Let me emphasize this, I shall not try to make my talk a scientific one; I couldn't do so if I would. My work, as you all know, has simply been of an executive nature, and while I have had to become more or less familiar with the composition of foods, that feature of the work is looked after in the laboratory by our chemists, and I have not felt called upon to try to go into it very far.

My purpose in arranging this exhibit is merely to show the necessity for the doing of this kind of work by a slate department and for the purpose of explaining the work. I am going to deal with the subject much the same as I would, or have, in my work of addressing different organizations over the state on this subject. I want to simply show the necessity for the work being done and to convert the public mind, if it needs converting at this time, to the fact that the chemists know what they are talking about when they publish certain findings upon analyses of food samples.

You will note that on the larger number of these samples we have the name of the manufacturer as well as the name of the article. This collection here is a very small part of a large collection that we have in the laboratory in the Old Capitol and in the office in this building. It is simply a representative exhibit. We have, I should judge, two thousand samples of this kind, and the majority of them bear the name of the manufacturer upon the package. We have exhibited them at different places, and you will agree with me that if the findings of the chemist were not correct we should have heard from the manufacturers long before this. In fact, we have heard from some of them who did not feel that the chemist was right, but in every case his findings have been proved correct. With this brief explanation I will try to outline the work of the Department.

All laws of this kind are police laws, and all prosecutions brought under them are brought in the criminal courts, so that in the enforcement of dairy and food laws the Department is dependent upon public sentiment