

I should like, also, to express my thanks to all those with whom I have been closely associated during my Presidentship, for their untiring courtesy, kindly forbearance and never failing help on all occasions.

Yours sincerely,
JANET FRANKLIN.

This seems to be a month of leave takings as we also regretfully part with Miss Griffin and Miss Graham who sail for home early this month. All T.N.A.I. members know them so well that we feel we are losing two old friends. Many of us know them personally, all of us know them through their faithful contributions to the Journal.

Miss Griffin did much for the Association during the time she was Honorary Secretary and her advice has always been valued by the Executive Committee. Miss Graham has given us very many valuable hints in her cookery notes in the Journal. Those of us who had the privilege of being present at the Delhi Conference were much interested in the work of the Health School which they have built up there, and we were fortunate in having our meetings in the hall of that school and enjoying the hospitality of Miss Griffin and Miss Graham. The good wishes of the Association are with them as they go home and we hope they will have good health to enjoy many happy years of retirement.

DIET IN DIABETES

By PROFESSOR V. H. MOTTRAM

Professor of Physiology in the University of London, King's College for Women (Household and Social Science Department).

Diabetes mellitus is a disease in which the body loses, either in part or completely, its power of dealing with glucose, and therefore with every digestible carbohydrate of the food. These carbohydrates are digested satisfactorily, but once inside the blood stream they are incapable of being turned into glycogen or burnt to carbon dioxide and water.

The disease is partly hereditary, but there is no need to worry too much about that aspect; it occurs frequently among Jews, among races which eat much rice, and in the more highly strung nations, such as the Americans; and usually attacks the better nourished and perhaps obese people. It shows itself to the average physician by the presence of glucose in the urine, though the absolute test is the way in which the blood-sugar behaves after a dose of glucose given by the mouth. In the normal person the fasting level of glucose in blood is 0.1 per cent; rises

to 0.15 per cent at about $1\frac{1}{2}$ hours after a carbohydrate meal and falls again, even below normal, within the next hour and a half. In the diabetic the glucose level is often higher; after a meal it shoots up perhaps even to 0.25 per cent, and comes down from the peak but slowly.

NOTEWORTHY SYMPTOMS

The excess of sugar in the blood is excreted as rapidly as possible by the kidneys, and this necessitates a large flow of urine. A person notices that he has to get up several times in the night. This urine output produces thirst (a noteworthy symptom), and the loss of the fuel value of the sugar produces hunger. Incapacity to utilise glucose produces acetone bodies (see Lecture IV.), and these, when present in large amounts, produce the coma with which the disease so often terminates.

The sugar in the blood comes partly from the protein, over half of the amino acids of which travel by the carbohydrate path, in very small amount from the glycerine of the fat; and mainly from the carbohydrates of the food. The sugar in the urine represents the excess of the sugar in the blood over the percentage at which the kidney allows it to leak away. In diabetes the leak point of the kidney is often raised, so that the patient may have diabetes though he is but rarely passing sugar in the urine.

The acetone bodies in the urine are excreted by the kidneys from the blood. Probably acetoacetic acid is the important acid while betahydroxybutyric acid and acetone (the other two acetone bodies) arise from it. They come as the result of incomplete combustion of the fat in the food (Lecture IV.), and arise mainly from the fatty acid of the fats, but also in part from protein. Some amino acids choose the path of fat when utilised by the body.

Before a clear conception of the disease was obtained it was customary to cut all carbohydrates out of the diet, with the result that the fat in the food gave rise to acetone bodies and killed the patient. Now we realise that you can treat mild cases by diet alone and the severe cases by diet and insulin—a substance which enables the body to combust its glucose in the normal way.

MILD DIABETES

Qualitative treatment of mild diabetes.—In the middle-aged and old it is often satisfactory simply to cut down the amount of food and to put certain foods on the forbidden list. These foods are the foods which contain much carbohydrate, such as the cereals, bread, potatoes and anything made from them such as puddings, pies, tarts, etc., and sugar and things sweetened with sugar. The only things which might catch a sane nurse napping are sausages, which contain bread; custard and blanc-manges made with cornflour and thick soups. Milk, because it contains

milk sugar, must be limited. A really mild diabetic may be allowed a little of the forbidden foods under the physician's orders.

Here is a diet for a mild diabetic suggested by Dr. R. D. Lawrence, a foremost specialist on diabetes :—

Breakfast.—Tea or coffee and a little *milk* ; one egg and one rasher of bacon and fried tomato, or fish ; *half-slice bread or toast* : sugarless marmalade ; butter.

Lunch.—Clear soup ; fish, fowl, or meat (moderate helping) ; any green vegetable or salad as desired ; one *small potato*, cheese, butter, celery, perhaps a small *cracker biscuit*.

Tea.—Tea and a little *milk*, saccharin if desired ; reliable diabetic bread or biscuit in strict moderation ; sugarless jam and butter ; watercress, tomato or lettuce, if desired.

Dinner.—As lunch, omitting potato ; add one small *orange* or *half apple* : a cream made with egg, cream and gelatin or similar “sweet” ; coffee with cream and saccharin. (NOTE :—The dangerous carbohydrate foods are italicised.)

A WEIGHED DIET

If such a diet does not keep the patient sugar-free, or if his blood sugar remains obstinately high a quantitative diet must be adopted. This necessitates weighing the amounts for every meal so as to be sure that the patient is not getting too large a quantity of food and too much sugar-producing food.

The physician will order so many “rations” or “lines” per day. (The patient's normal naked weight is divided by 16·5, and this for an ordinary weight man will give the number of rations—*e.g.*, 10 per day.) From a table of the “Line-Ration” system, published by H. K. Lewis and Co., Gower Street, London, W. C. I., we can choose the meals for such a patient. Suppose we allot three rations for breakfast, three for lunch, three for supper and one for tea ; then for breakfast we can choose for him from the table grape fruit in skin 4 oz., one egg and $\frac{1}{4}$ oz. butter, 2 oz. bacon and 10 oz. tomatoes. This equals three rations and he may add bran biscuit and sugarless marmalade to the list. (Each ration contains $7\frac{1}{2}$ gm. protein, 15 gm. fat, and 5 gm. carbohydrate, and yields 190 great calories.) Other meals are quite as simple to work out from the cards.

Another method is the five-gram diet scheme. The physician instructs that the patient is to have (say) 100 gm protein, 160 fat, and 100 carbohydrate per day given in four meals per day—*i.e.*, 25 gm. protein, 40 fat and 25 carbohydrate per meal. Choose first from food tables published by Skinner and Co., Denmark Hill, London, S. E. 5, the foods to give 25 gm. carbohydrate for breakfast—*e.g.*, $\frac{3}{4}$ oz raw oatmeal (to be

cooked in the usual way) plus $3\frac{1}{2}$ oz. milk plus 8 oz. boiled cabbage give 25 gm. carbohydrate. These foods the tables show us give 8 gm. protein, so there is 17 gm. left to be given. One egg will give 6 gm. protein and 2 oz. fried bacon will give 10 gm. which is near enough to the 17. Incidentally, we have given 3 gm. fat in the oatmeal, $3\frac{1}{2}$ in the milk, 30 in the bacon and $5\frac{1}{2}$ in the egg. Total equals 42. We have thus given a meal containing 24 gm. protein, 42 gm. fat, and 25 gm. carbohydrate represented as porridge, milk, cabbage, bacon and egg, and the result is near enough to the prescribed.

DIET AND INSULIN

It may be that even quantitative dieting will not free the urine from sugar, in which case the physician will prescribe insulin in addition. The dietetic treatment is the same. The physician will order a diet containing (say) 68 gm. protein, 83 gm. fat, and 56 gm. carbohydrate per day, and give doses of insulin of 10 and 5 units, before breakfast and before supper respectively.

Suppose that we choose for breakfast to give 24 gm. protein, 27 gm. fat and 20 carbohydrate, we proceed as before from the 5 gm. table of foods, and arrange the breakfast thus:—

Grape Fruit	... 4 oz. = 5 gm.	Carbohydrate $\frac{1}{2}$ gm.	Protein 0 gm.	Fat
Cabbage (once boiled).	8 " = 5 "	" $1\frac{1}{2}$ "	" 0 "	"
Boiled oatmeal	... 3 " = 10 "	" 1 "	" 1 "	"
Bacon (fried)	... 1 " = 0 "	" 5 "	" 15 "	"
Egg	... 1 " = 0 "	" 6 "	" $5\frac{1}{2}$ "	"
Sole steamed	... 2 " = 0 "	" 10 "	" 0 "	"
Cream	... 1 " = 0 "	" 0 "	" 5 "	"
Total ...	20	24	$26\frac{1}{2}$ "	"

This is close enough to the prescription, though if we wish to be painstakingly accurate we must remember that we have $\frac{1}{2}$ gm. of fat to add to one of the other meals.

The nurse in charge of a diabetic case must understand the utilisation of protein, fat and carbohydrate by the body, and be able to translate, by the help of tables published, the prescription of the physician of so much protein, fat and carbohydrate per day, into ounces of fish, meat, butter and other foods.