

cough. Remember that the cough of a consumptive patient is often one that he does not seem to hear himself, while those around him know it well. The cough results in expectoration, and it is your duty to examine the sputum. I would remind you that recent researches seem to show that the tubercle bacillus by itself is probably responsible for very nearly all, if not all, the symptoms of consumption, and that other organisms are of minor importance. The pyrexia of consumption is a symptom upon which much work has been done at this hospital. It still remains a great mystery. When the clinical thermometer was first introduced into this hospital the observations were taken but twice a day, at 10 in the morning and at 10 at night. We now know that the best times for observations are between 8 in the morning and 8 at night. From this you will realise that the earlier observations missed some of the principal phenomena. By taking hourly records for 24 hours, and repeating after a few days' interval, we were able to arrive at certain generalisations with regard to the course of the temperature in this disease. Low temperatures may have quite as bad an import as high. The lowest observation that I made recorded a temperature of 91.7° F. at 6 in the morning. By 8 o'clock that night the patient's temperature had risen to 103°. But such extreme variations as these are exceptional. High fever is unusual; the temperature seldom reaches 104°. The rise of temperature usually begins somewhere between noon and 2 P.M., and the maximum is generally reached between 5 and 8 P.M. With regard to loss of colour and loss of flesh, remember that they are not constant accompaniments of the disease. If the patient be fed well there may be actual gain of weight, although the disease is progressive.

There are two chief pathological conditions giving rise to hæmoptysis. The tuberculous process may invade the wall of a small vessel and destroy it. In my work on consumption you will find a picture showing a caseating tuberculous nodule invading the walls of a blood-vessel and encroaching upon its lumen. The second form of hæmoptysis results from the rupture of an ectasia or aneurysm of a larger branch of the pulmonary artery which has been left exposed and still pervious in a cavity in the lung. There is a famous specimen in the museum of this hospital where there are as many, I believe, as 36 such aneurysms, each in its little cavity. If such an aneurysm bursts it is not possible to do anything in the way of treatment. The outlook is most serious. When I suspect such a condition to be present I warn my patients not to exert themselves to climb hills or to lift heavy weights. Time does not permit me to draw your attention to some of the physical signs which indicate consolidation of the lung tissue, and those which indicate that the disease is spreading, that there is softening and excavation, that cavities are increasing or contracting, but I trust that in the course for which you have entered you will have demonstrated to you examples of all these processes.

THE INDIVIDUAL TREATMENT OF DIABETES.

BY S. A. ARANY, M.D.

THERE is no other disease in the treatment of which so little is individualised as in diabetes, and there is also no doubt that in no other ailment can proper treatment do so much to improve the patient's condition and to prolong his life than in diabetes. Very much wrong can be done in this respect *intra et extra muros*—viz., by specialist and general practitioner, the former sticking very often too rigidly to his own narrow-minded view of the ailment, and the latter neglecting to combine the advances of science with his own experience. For it is of no use to adopt a certain authority's treatment on account of his having obtained good results in his cases, and to stick to it through thick and thin, but it is our most important duty to accommodate our treatment to each individual case.

When treating a diabetic patient our principal aim should be to make him free from sugar, or if we cannot obtain this result we must endeavour to reduce the amount of sugar passed to as great an extent as possible. This we can obtain by one means only—i.e., by a suitable diet. All the

other therapeutical agents, such as medicinal and spa treatment, are only useful adjuvants, and cannot by themselves produce any appreciable effect upon the ailment. It is not at all easy to explain what is meant by a suitable diet, and if we offer the following seemingly pleonastic explanation, that a diet is suitable if it suits the individual case, we only want to emphasise the fact that it is a grave mistake to speak of a diabetic diet, as the diet suiting diabetic A may be detrimental to diabetic B. Everybody who has had a great number of diabetic patients under his care will admit that the nature of the disease is manifold, and almost every case is different from the other. To illustrate the truth of this statement, I may mention a case in which the ingestion of sweet fruit did not produce sugar, whereas even the smallest amount of potatoes was instrumental in producing glycosuria. In spite of the great variation of the cases I consider myself justified in distinguishing the following three types of diabetes:—

1. To the first category belong those cases in which the restriction and sometimes only the regulation of carbohydrates makes the patient free from sugar.

2. To the second variety belong those cases in which only the total withdrawal of the carbohydrates stops the glycosuria.

3. Finally, the third kind represent those cases in which the total withdrawal of the carbohydrates only reduces the amount of sugar passed by the patient, or has no appreciable effect upon the same.

It does not come within the scope of my present paper to investigate whether these three kinds of cases represent various stages of one and the same disease produced by one and the same noxious influence. Let us consider the dietetic measures which we are to take in the three kinds of cases.

When a diabetic patient comes under our observation we cannot tell at once to which category he belongs, and in order to establish this we must investigate his assimilative power, or, as the German authors say, his tolerance for carbohydrates. This is best done by putting the patient first on a diet as nearly free from carbohydrates as possible. I do not use the colloquial term of carbohydrate-free diet, on account of its being illusory in the true sense of the word, as almost every article of food contains a small amount of carbohydrates. This diet, as it is intended, as a starting diet for all kinds of cases may be laid down in the following formula.

Breakfast.—Tea, with lemon, or a few drops of cream sweetened with saccharin, or black coffee with the yolk of an egg; eggs in any shape; ham or bacon, preferably of a fat quality; almond bread with butter.

Mid-day dinner.—Clear soup with an egg in it, fish or meat of any kind (with exception of liver); if not prepared with flour, one or two of the following vegetables—French beans, cauliflower, spinach, sauerkraut, asparagus, chicory, celery, rhubarb, Brussels sprouts, artichokes, cabbage, sorrel, savoy, white beet, lettuce, tomato, endive, cress, dandelion, purslane, cucumber, mushrooms; plain omelette; cheese and butter, specially prepared biscuits; half pint of claret or hock if required, or mineral water.

At 5 p.m.—Tea, sour or buttermilk.

At 7.30 p.m.—Light supper, consisting of hot or cold meat, one of above vegetables, cheese and butter with almond bread, half a pint of wine, black coffee.

If this diet is strictly observed patients belonging to the first kind of cases will entirely lose their sugar in the course of a few days, and will also have regained some of their assimilative power of carbohydrates. At this point it has to be decided whether the time has yet arrived to add any carbohydrates to the patient's diet. It is always advisable to postpone this till the patient has been free from sugar for a fortnight, and only then to start to establish the patient's tolerance for carbohydrates. For this purpose we may commence to add small quantities of bread to the patient's diet, as it is always found that it is this article of food the patient lacks most. It is advisable to start with as small a quantity of bread as 50 grammes per day, and even this quantity is to be divided between each meal. Should this amount not produce glycosuria we can safely increase the quantity of bread by 50 grammes until the limit of the patient's tolerance is reached, which latter must by no means be over-balanced. If the patient is able to assimilate an appreciable amount of bread, other kinds of carbohydrates may be tested, and for this purpose a certain amount of the bread may be replaced by potatoes, rice, or oatmeal, although it will be found that a

greater amount of carbohydrates is tolerated if only one kind is consumed by the patient, whereas if various kinds of cereals are used the limit of the assimilative power gets much lower. This is a very striking and important feature in diabetes to which allusion will have to be made when dealing with the so-called oatmeal treatment. Patients belonging to the first class of cases may regain their assimilative power to such an extent that they are able to assimilate an unlimited amount of carbohydrates, and only the ingestion of sugar and that of the sweeter kinds of fruit are apt to produce glycosuria with them. In these cases the glycosuria *ex amylo* has been reduced to glycosuria *e saccharo*, which is regarded by most physicians as the smallest kind of failure of the assimilative power, although there are cases, as mentioned above, in which the assimilation of the sugar is normal, or almost normal, and that of the starchy food is impaired. This circumstance admits an assumption which I have already discussed elsewhere, that the different kinds of carbohydrates are differently utilised by the system.

It is an almost general custom with medical men to give their patient a list of foods containing articles of diet which they may, and such as they must not, consume. With this list the patient is left at large, and runs away with the idea that he may consume an indiscriminate amount of the food-stuffs on the list. This gives rise in the majority of the cases to polyphagia, which is a pathological symptom as long as the patient's state is not compensated, but which can easily become a habit even if the patient is in perfect compensation, and is very often instrumental in aggravating his condition. It is, therefore, very important to regulate the patient's diet, not only as far as the carbohydrates are concerned, but also with regard to the other foodstuffs, and we must bear in mind that the patient must not consume more than is required to make up the Calories demanded by his system. These amount, according to present-day conception, to from 35 to 40 Calories for each kilo of body weight, which is, however, very often misinterpreted, as a short, stout man, having the weight of a tall and ordinarily fed individual, ought not to take the amount of food which would correspond with the amount of Calories required by each kilo of body weight. It will, therefore, be useful to give an instance as to what a diabetic weighing 60 kilos and measuring 5 ft. 9 in., and whose assimilative power tolerates 200 grammes of carbohydrates, should take during 24 hours:—

Amount of food.	Calories.
4 eggs	300
25 grammes of bacon	220
250 „ beef	250
200 „ veal or fowl	150
200 „ fish	120
25 „ butter	200
50 „ cheese	240
200 „ spinach	70
200 „ lettuce	40
200 „ milk, corresponding to 50 grammes of white bread	140
60 „ potatoes = 20 grammes of white bread... ..	50
120 „ apples = 20 „ „ „ ..	60
40 „ porridge = 20 „ „ „ ..	210
100 „ white bread	270
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The *second category* of cases represents such patients as are not able to assimilate even the smallest amount of carbohydrates, and who after the ingestion of such pass a smaller or larger amount of sugar. The procedure to be taken in these cases will depend upon the amount of sugar the patient is passing, and if it is found that it does not exceed 1 per cent. after the ingestion of an amount of carbohydrates satisfying the patient's need, I think we are justified in giving him this amount of carbohydrates for a certain length of time, after which the carbohydrates can be withdrawn for a fortnight to produce a sugar-free state. It is of the utmost importance to make the patient free from sugar from time to time, as this condition increases his tolerance for carbohydrates, whereas if the glycosuria is left to its fate it rapidly increases in intensity. On the other hand, on the constant withdrawal of carbohydrates ensues the most feared symptom of acidosis, which is as a rule accompanied by loss of bodily weight. I think that most physicians will agree with me that diabetics suffer less by passing a certain

amount of glucose than by passing even traces of acetone bodies. For this reason I add to this kind of patient's diet such an amount of carbohydrates as is able to stop the acidosis, and usually find that, although this procedure is followed by an increase of sugar, it is also instrumental in stopping the acidosis and in increasing the patient's bodily weight.

In the *third category* of cases we find that even the total withdrawal of carbohydrates is not followed by a sugar-free state, which shows that the disease has developed into a state in which proteids and fat are the source of the glycosuria. In some of these cases it will be found that the glycosuria is the result of over-eating, and it will soon be reduced, and sometimes even checked, by giving the patient the proper amount of food. In other cases the reduction of the food ingested will not produce any appreciable change; moreover, it will increase the acidosis, which is an almost constant accompaniment of these cases. Then some carbohydrates must be added to the diet by which not only will the acidosis be decreased, but in the majority of the cases no increase of the glycosuria will be noticeable—i.e., the patient will pass the same amount of sugar as he passed before the addition of the carbohydrates to his diet.

With the increasing intensity of the disease the formation of sugar, proteids and fat as well as the acidosis increase to such an extent as to imperil the patient's life, at which stage it becomes necessary to put the patient for from two to eight days on a diet nearly free from animal food, as already Bouchardat has found that proteids contained in vegetables are better tolerated by most diabetics than those contained in animal food. The formula I employ runs thus:—

Breakfast.—Tea with cream, or black coffee, poached egg and 25 grammes of bacon; almond bread and 20 grammes of butter.

Dinner.—Beef-tea with an egg in it, spinach with (25 grammes) fat and two eggs in it; asparagus with (25 grammes) butter, coffee with cream.

At 5 p.m.—Tea with cream.

Supper.—Cauliflower with 25 grammes butter, salad with 20 grammes oil, two hard-boiled eggs or omelette.

This diet, owing to its richness of fat, amounts to about 2000 Calories, if from 600 to 700 grammes of vegetables are consumed per day, and will not prove insupportable for a few days. By means of this diet I have very often reduced the sugar to *nil* in a day or two, and then replaced part of the vegetables and fat stuffs by small quantities of meat and still smaller quantities of carbohydrates, and found that the patient's tolerance for these latter, too, has increased under the influence of the vegetable *régime*. In other cases it will be necessary to continue this *régime* for five or six days; but whatever the result be it will not be advisable to go on with it for more than eight days (even if we find that the patient's tolerance for animal food has increased up to the normal standard) should the limit of Calories required by his system be exceeded. As mentioned before, the vegetable *régime* improves not only the assimilation of animal proteids but also increases the patient's tolerance for carbohydrates, and it will be seen that a patient who before the vegetarian diet was passing sugar on an entirely carbohydrate-free diet, will become able, after a few days' vegetarian diet, to assimilate not only a normal amount of animal food but also a small amount of carbohydrates.

For how many days the vegetarian *régime* is to be continued entirely depends upon the nature of the case, and so does the effect produced by the *régime*. In some cases it will have improved the patient's tolerance for months, in others for a few weeks only, and it will be the medical adviser's duty to ascertain how often the patient is to be put on a few days' vegetarian *régime*. Noorden¹ and some other German authors ordered the vegetarian days to be followed by the so-called oatmeal treatment.

Oatmeal treatment.—This consists in giving the patient for a few days an oatmeal dish very much like porridge, but prepared with plenty of butter, the daily amount of oatmeal averaging between 150 and 250 grammes. This is fairly well tolerated by a number of patients on account of their improved assimilative power, owing to the preceding vegetarian *régime*, but no special quality or healing power must be ascribed to the oatmeal, as patients who are able to tolerate this latter can also assimilate a corresponding

¹ Noorden: Handbuch der Stoffwechselkrankheiten.

amount of another cereal, especially if only one kind be given.

It will be seen from all this how much harm can be done by prescribing an unsuitable diet to a diabetic patient, and how much discrimination must be used in the quality and quantity of the food we recommend to the patient. Even in one and the same case the diet has to be changed as often as alteration takes place in the patient's condition, as the tolerance for carbohydrates as well as for proteids cannot be established for an unlimited period. Even the season of the year is not without an influence upon the patient's condition, and I² was the first to call attention to the fact that the glycosuria as well as the elimination of acetone-bodies increase during the colder part of the year.

Concluding the dietary question, let us discuss some of the most important articles of food recommended to diabetic patients.

Liquids.—Bouillon possesses no nutritive value at all, but it satisfies the diabetic's so-called "stomach-hunger" and is a very good carrier of eggs. The nutritive value of tea and coffee does not exceed very much that of bouillon, but if taken with fat cream either is a welcome addition to the diabetic's diet. The nutritive value of alcohol is denied by most authors, but even if the case be such I gladly avail myself of it in patients who are in the habit of taking a moderate amount of wine, the more so as the diabetic's diet is, owing to its richness in fat, hard to digest, and that the moderate use of wine is helpful to the digestion cannot be denied even by the greatest foe of alcohol.

Meat, and especially its fatter kinds, such as beef, pork, and goose, are the diabetic's principal source of proteids; veal, venison, and fish make the diet more varied, but their nutritive value does not rank so high as that of the former.

Fats play a most important part in the nutrition of the diabetic, as they are most readily assimilated and contain a large amount of Calories in a concentrated state. They are very well tolerated in the shape of bacon and butter, and as an addition to other foodstuffs.

Eggs, owing to their richness in proteids, rank as highly as meat, their greatest advantage being that they are gladly taken by the patient, and can be prepared in various ways. They are also excellent carriers of fat.

Vegetables should be the diabetic's principal article of food, (1) on account of their proteids being better tolerated by the patient than those of animal food; (2) because they are very good carriers of fat; and (3) owing to their filling the patient's stomach up, whereby the diabetic's stomach-hunger gets more satisfaction than if an amount of meat, corresponding with the Calories of the vegetables, were ingested by him.

Fruit.—Only the sour kinds of fruit can come into consideration, and even these must not be recommended to patients of the third category.

Milk and its products.—Sweet milk contains from 4 to 5 per cent. of milk-sugar, and is fairly well tolerated by patients belonging to the first and second category if given in moderation. Cream contains less sugar and more fat than milk, and is therefore preferable in patients of the third category, if not used too generously. Sour milk contains, of course, less sugar than fresh milk and may be used more freely, and is a very useful addition to the grave diabetic's diet. Butter should be consumed in large quantities, and the same refers to cheese, especially to its fatter kinds.

The question of *bread* is the greatest importance. The patient usually desires more of it than the doctor can possibly grant him. This situation can be helped if the ordinary bread is replaced by a larger amount of aleuronat bread, containing only half the amount of flour of ordinary bread, the other half being replaced by aleuron, a vegetable proteid. It must be emphasised that some preparations sold under this heading are unreliable.

Medicinal and spa treatment.—Although the number of drugs recommended year by year is legion, our therapeutical knowledge stands much where it stood a hundred years ago, and we are compelled to avail ourselves principally of opium in cases in which the dietary measures do not prove sufficient. Especially cases belonging to the third category require this drug from time to time, and it will be found that only large doses produce a somewhat mitigating effect upon the polyuria and sometimes also upon the glycosuria, but

no effect whatever upon the acidosis. As a preventive of the last-named, the alkali treatment comes into consideration, and it is advisable to use a combination of different alkaline salts in large doses. This accounts for the efficaciousness of the alkaline mineral waters, containing different kind of alkali in readily assimilable doses. The efficacy of these waters is increased by their hot temperature, which accelerates their reaching and neutralising the blood. It is also a well-known fact that patients who cannot get rid of their glucose by dietary measures, sooner lose their sugar if the dietary treatment is from time to time combined with a course of alkaline waters. Besides, it must not be forgotten that the diabetic's diet is rather hard to digest, and very frequently digestive disorders of various kinds ensue, which may be effectively treated by alkaline waters. It is, therefore, advisable to prescribe in such cases once or twice a year a three or four weeks' course of mineral water treatment, for which purpose from two to three tumblerfuls of the warmed Karlsbad Mühlbrunn at intervals of 15 minutes will be found the most efficacious. It cannot be denied that these waters are less efficacious in a bottled condition than if taken on the spot, but it is equally true that they do not lose the whole of their value by the transport, and it is a good deal better to take them at home than not to take them at all.

With regard to health resort treatment, it goes without saying that the spas having alkaline springs are to be considered in the first place, but before sending a patient anywhere we must make sure that the dietary conditions of the spa we select are suitable for a diabetic patient. In this respect the Austrian spas are quite reliable. Not quite so good are these conditions in Germany; and in the French health resort the patient is almost left at large. Mountain climbing and mountain air are very useful adjuvants of the spa treatment, and are not infrequently instrumental in improving the patient's assimilation.

Carlsbad.

Clinical Notes :

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF FOREIGN BODY IN THE OESOPHAGUS.

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A BOY presented himself at the Seamen's Hospital, Greenwich, with the history that one day previous to his attending he had swallowed a piece of rabbit bone, and that attempts had been made to remove it with a probang. As a result of this treatment he had suffered very acute pain, and when seen was quite unable to swallow even water. No swelling could be detected in the neck on palpation, although the patient complained that the object seemed to be impacted at a point about an inch below the cricoid cartilage. He was given a general anæsthetic, and I examined him by direct oesophagoscopy.

At a point about an inch below the cricoid cartilage a fairly large swelling, which was covered with acutely inflamed mucous membrane, was seen upon the posterior wall of the oesophagus. On pressure about 1 drachm of pus was expelled from this swelling, when a small white object was seen projecting through the opening from which the pus had escaped. This was seized with forceps, and on being removed proved to be a piece of rabbit bone one inch long and pointed at both ends. During the extraction the abscess cavity was opened quite freely, so that there was no need to incise it in order to provide free drainage. No food was given by the mouth for four or five days, the patient being fed rectally. Bismuth emulsion in 1 drachm doses was given three times a day (bismuth carb., 30 gr.; lanoline, 1 drachm; ol. petroli, ad 1 oz.). For six days the patient progressed quite satisfactorily, but on the seventh his temperature shot up to 105° F., and was accompanied by a certain amount of dyspnoea and dysphagia.

On examination the resident medical officer, Mr. A. Gibson, found that there was a slight swelling present

² S. A. Arany: Some Points in Diabetes, THE LANCET, Feb. 23rd, 1907, p. 521.