data are as generally applicable in the detection of feigned diseases as are physical signs and symptoms in the diagnosis of real disease; and hence it is chiefly in the *management* of feigned cases that the circumstances of the patient take effect. It is true the prison surgeon possesses facilities for enforcing strict observation, and the carrying out of his instructions, that are not at the disposal of those engaged in general practice, but he is none the less bound to obey those dictates of humanity which secure to the suspected schemer the "benefit of the doubt," and to the undoubted schemer protection from any kind of medical treatment bordering on the cruel or barbarous.

ARTICLE VIII. — *On the Treatment of Diabetes by Lactic Acid (Cantani's method).* By GEORGE WILLIAM BALFOUR, M.D., F.R.C.P.E., Physician to the Royal Infirmary, Edinburgh.

(Read to the Medico-Chirurgical Society of Edinburgh, 15th November 1871.)

TOWARDS the end of last century (1796) John Rollo first propounded the theory that diabetes mellitus consisted essentially in some morbid change in the functions of digestion and assimilation, and conceived the idea of remedying this abnormal condition by cutting off from the food the supply of starchy matter from which he believed the sugar to be chiefly formed, employing also emetics, narcotics, and tonics. Rollo thus laid the foundation of that system of treating diabetes which still prevails, which, mainly dietetic, consists also largely in the administration of tonics and narcotics. In France this theory and treatment were adopted by M. Bouchardat (1841), who further showed that, for the complete conversion of starch into sugar, from seven to eight times its weight of water is required; thus accounting for the terrible and irresistible thirst of diabetic patients wholly irrespective of their excessive urination, which may be regarded as produced by the excessive ingestion of fluids rather than as its result.

The more important variations in the dietetic treatment of diabetes in recent times have been—1st, The use of alkalies, chiefly the carbonated alkalies, which is based upon Mialhe's theory (1843), that the sugar formed from the starchy articles of food in a healthy body is destroyed by the natural alkalinity of the blood, a property he supposed to be defective in diabetic patients. This theory has been shown to be wrong in every point, yet the treatment founded upon it has had a considerable amount of success. 2d, We have Reynoso's theory (1853), that the sugar in the blood of a healthy subject is burned in the lungs, and that it only appeared in the urine because of defective respiration; he therefore recommended a stimulating

plan of treatment to increase the respiratory function; and the employment of the peroxide of hydrogen in modern times, as well as that of the permanganate of potass, is based upon this view of the origin of diabetes, which, although accurate enough in the fact that sugar does frequently appear in the urine of those whose respiration is impeded, is yet in so far defective that the development of grape sugar into lactic acid, the first stage of its combustion, requires no oxygen. 3d, Claude Bernard's remarkable experiments (1848)—which seemed to prove the nervous origin of this disease, but which Schiff showed could not act without a liver, and acted mainly, apparently, by producing hyperæmia of that organ—gave a considerable impulse to the use of narcotics and nerve sedatives, especially such as opium, codeia, and bromide of potassium, which so act upon the vaso-motor nerves as to reduce hyperæmia, all of which give considerable relief, and have had a certain amount of success. 4th, We have a modern return to the more purely dietetic treatment of diabetes in the employment of skim-milk as the sole article of food, a method of treatment which has been lately extolled by Dr Donkin of Sunderland.

Now, without entering more at large into the pathology of diabetes, it is obvious that these various modes of treating it are all underlain by one common fact—viz., that in diabetics the natural glycogenic function is discharged in a morbid manner, and that this morbid discharge of function may be importantly modified in two modes; 1st, by depriving the organism of that pabulum from which the glucose is mainly derived, and, 2d, by employing such remedies as are capable of altering the nervous energy of the organs at fault: practically it has been hitherto found of importance to conjoin these two methods.

The chemical treatment of diabetes by the attempted burning the sugar by artificially induced hyperoxygenation of the blood, has not been found more successful than the simple dietetic plan without this addition, and for the chemical reason stated this could not be otherwise. While the basis of the other chemical treatment, that by alkalies, has been shown to be erroneous, the blood of diabetic patients being not less alkaline than that of others on the one hand, while on the other, a fluid even more alkaline than blood cannot decompose glucose, so that if the alkaline treatment have really proved more successful than the simple dietetic plan, that must have depended on its exercising some modifying power over the function at fault—a modifying power, however, of so doubtful a character that it has not been able to prevent this method of treatment from falling, in this country at least, into comparative desuetude.

It is a matter of daily observation, that morbid alterations of function are frequently only to be permanently remedied by a restoration of the body to its normal standard, the great difficulty of promoting a cure in such cases being the impossibility of giving

perfect rest to one organ while endeavouring to build up the frame, the skill of the physician being shown by the manner in which he solves this complicated problem, giving as much rest as possible to the organ at fault, while at the same time improving the general nutrition, and thus restoring the healthy tone to the constitution. It is in this respect that all the treatments hitherto propounded for diabetes have failed; they may have given rest to the organ at fault, but they have too often depressed the general health, and, while giving temporary relief, have possibly in many cases hastened the end; and even when a tonic treatment has been mainly relied on it has failed for want of physiological adaptation. It is in this respect that Cantani's treatment is pre-eminently useful; it relieves without depressing, it gives as nearly as possible perfect rest to the organ at fault, and at the same time builds up the body by an artificial adaptation of physiological means, and restores the healthy tone to the constitution, thus enabling it to return to healthy action. It is by no means put forth as a perfect cure for all cases of diabetes; it is a means of relief to all, but only a cure for some; yet it seems to act curatively in a larger proportion of cases than any other mode of treatment hitherto devised, while the relief to all is more perfect.

Professor Alnaldo Cantani of Naples agrees so far with Reynoso in believing that in diabetes the question is not so much one of increased production of sugar as of defective combustion; this he conceives to be proved by the small number of respirations made by diabetic patients and by their average low temperature, ranging, according to him, from 95° to 96°·8 F. in uncomplicated cases; the temperature, of course, rising with any complication—such as tuberculosis—giving rise to pyrexia, but always remaining below the normal of such pyrexia. This defective combustion he believes to depend upon the production of a morbid form of glucose, which he has termed *paragluco**se*; this is incapable of being transformed into lactic acid, and therefore cannot be burned; it is consequently passed unchanged in the urine. The result of this is, that the sugar and starch of the food being transformed into this incombustible *paragluco**se*, the heat of the body is in so far maintained at the expense of the albuminates and fats, and from the combustion of the former we have that excess of urea which adds so greatly to the density in many cases of diabetes, while, as the albuminates and fats which the patient receives as food are insufficient for his requirements, those of his own tissues are also employed, and hence his rapid emaciation.

In the early stages of diabetes the quantity of sugar passed in the urine oscillates with the diet, and with an exclusively animal diet is much lessened in twenty-four hours, and may entirely disappear in a few days; in the later stages, when sugar persists in the urine even after the withdrawal of all amylaceous food, Cantani believes that not only the inosite of the muscles may be transform-

ed into paraglucoſe, but alſo that the gelatinous tiſſues, which Baedeker ſucceeded in transforming into ſugar apart from the ſystem, may in this anormal pathological condition become transformed into paraglucoſe, and thus account for the perſiſtence of ſugar in the urine of thoſe fed excluſively on an animal diet apart altogether from the queſtion of the albuminates themſelves being transformed into diabetic ſugar. Thus, though all diabetics are to a certain extent autophagic, we may yet have this abnormality developed to exceſs, and may thus have three ſteps in this diſeaſe: firſt, that in which the ſugar oſcillates with the quantity of amylaceous food ſupplied; ſecond, that in which the inoſite and gelatinous matter of the animal food are transformed into diabetic ſugar; and, third, when not only theſe but alſo the inoſite and gelatinous matters of the body of the patient himſelf are ſo transformed—a moſt ſevere and hopeleſs form of autophagia. Cantani, with moſt modern pathologiſts, recogniſes the liver as the organ mainly at fault in theſe caſes; but whatever the organ may be, he propoſes to give it as complete a reſt as poſſible, by depriving it of its pabulum in ſubjecting the patient to a rigorous meat diet, thus reducing to a minimum the introduction into the ſystem of the ſugar-producing ſubſtances. But as that is only a temporary expedient, having reference to only one element of this diſeaſe, and incapable of arreſting the waſte and ultimate complete degradation of the body, he further propoſes to prevent this waſte by ſupplying a combuſtible agent in a quantity ſufficient for the wants of the body, ſo that the fats and albuminates may continue to be ſtored, and the body thus gradually reſtored to its normal ſtandard; and he hopes that this reſtoration of the healthy ſtandard of the conſtitution, coupled with the prolonged functional reſt to the organ affected, may ſuffice to prevent any relapſe into its morbid condition even after a return to the ordinary dietetic conditions of modern civilized life. The reſult of Cantani's experiments have to a large extent proved the correctness of his views. The combuſtible agent which Cantani has ſelected is lactic acid, and it has been wiſely choſen, inasmuch as it is in all probability that agent employed in the normal conditions of nutrition, repreſenting as it does the intermediate ſtage between glucoſe and carbonic acid,¹ ſo that not only is a complete reſt given to the organ at fault, but that very agent is ſupplied to the ſystem which would have been normally preſent had the organ at fault been doing its duty after a normal faſhion, ſo that while as complete a relief as poſſible is afforded to the organ at fault, there is in no reſpect any anormal ſtrain put upon the ſystem. The organ at fault is for the time being merely thrown out of gear, but all the other functions proceed in a natural manner, ſo that, when the normal tone of the organ has been re-acquired, it

¹ "What we have to do is to convert diabetic ſugar—*i.e.*, glucoſe—into lactic acid."—Headland on the Actions of Medicine, 1867, p. 218.

may again be replaced in the natural cycle without the harmony of the natural sequence of the functions being in any way interrupted either by the cessation or the restoration of its function. The quantity of lactic acid which Cantani administers is from 77 to 154 grains daily, diluted in from 8 to 10 fluid ounces of water, and taken during the day. His exclusively meat diet means rigorously one of plain meat, roast or boiled, without any sauces of milk or eggs, and certainly without any bread, flour, or any vegetable matter whatever, the only seasoning permitted being salt, oil, and a little vinegar. For drink he allows water, either plain or with a little of the purest alcohol; coffee, tea, and wine being prohibited. His results have been somewhat surprising. In recent cases the cure is stated to be almost certain and speedy; and even where an exclusively meat diet is not persisted in, life is apparently prolonged, and many of the unfavourable results of diabetes are prevented, though the mellituria is not arrested. Dr Sammut of Naples, from whose report I quote,¹ states that he has seen an army lieutenant enter the hospital emaciated, weak, and impotent, with polyuria, thirst, and extraordinary hunger. In twelve days the last trace of sugar had disappeared from the urine, and in six weeks the patient had gained nine pounds. He left the hospital in excellent condition—florid, strong, without thirst or hunger; he continued the treatment for two months more at home, and then resumed mixed diet, and after the lapse of eight months he was in excellent health, and weighed twenty-one pounds more than when he entered hospital, being also without a trace of sugar in the urine, though eating indiscriminately of all that came before him. A tailor from Naples was admitted in a desperate condition. He left florid and robust. Since then, for more than seven months, he has been eating promiscuously, and is more fat, rubicund, vigorous, and energetic than before his attack. Dr Sammut also states that he saw in Cantani's clinic several other diabetics—he mentions five—all much improved, and several believing themselves to be perfectly cured.

These results are certainly very remarkable, and being a continuous series following the employment of a treatment based on rational considerations, are sufficient to claim the attention of every medical man interested in the progress of therapeutics. And I may remark that the latest treatment of diabetes propounded in this country—that by skim-milk—bears out Cantani's views in so far that it is a strictly animal diet, free from amylaceous matter, and containing three to six per cent. of lactic acid, which, under the influence of the caseous matter, becomes transformed into lactic acid. This treatment is therefore an approach, but a very meagre one, to Cantani's apparently more perfect system; and I may add that the results of the two systems in my own practice have fully convinced me of the greater applicability and more perfect success, so far as time allows me to judge, of Cantani's method.

¹ *Vide* British Medical Journal, February 25, 1871, p. 208.

The first case in which I employed it was not a favourable one. The patient had been formerly much benefited by the conjunction of opium in large doses with the dietetic treatment. He returned two years afterwards with commencing phthisis, and though benefited somewhat by the lactic acid treatment, yet he died, as was naturally to be expected. His urine fell in five days from an average of about 250 ounces to 70 ounces in the day, the specific gravity remaining about the same—1.030; this high specific gravity being apparently due to the amount of urea and uric acid present, a condition of matters usual in this treatment. The deposit of red oxide of copper following the application of Trommer's, which had been copious, ceased entirely, and was replaced by a brownish discoloration due to the excess of uric acid present. No change took place on boiling with liquor potassæ (Moore's test). The poor man therefore lost the main symptom of his disease, but he died exhausted after about three months' treatment.

CASE 2.—David Hume, an engineer, aged 53, was admitted into Ward V. on July 14, 1871, complaining of great thirst, debility, and polyuria. Three years ago he suffered from a stroke of paralysis which affected the right arm and leg. He was able to resume work three months subsequently, but still complains of weakness in the right leg and dulness of hearing in the right ear. His integuments are rather dry, his joints normal, but his limbs are much emaciated, and he sleeps badly at night. Sensation and intelligence normal, but motion much impaired from his great exhaustion, having had to rest frequently in coming upstairs to the ward. He measures 5 ft. 7 in., and weighs only 8 st. 8 lbs. His tongue is dry in the centre, moist and clammy at the tip and edges, red, and glazed. His mouth and fauces dry. He has a constant bad taste in his mouth. His teeth are decayed. His digestion good, but his bowels usually constipated. His arteries are atheromatous, but the circulatory and respiratory systems otherwise normal. He calculates his total drink at 100 ounces daily, but he passes between 300 and 400 ounces of a pale-coloured urine daily, spec. grav. 1.030, and showing a large amount of sugar by the ordinary tests. He states that he has been under medical treatment for upwards of a year, but has nevertheless been gradually getting worse, and he dates the commencement of this illness between three and four years ago. Up to the 15th of August he received only ordinary diet and no special treatment, but this day he was placed upon a strict meat diet, consisting of 2 lbs. of boiled meat and 2 lbs. of steak in the twenty-four hours, which was the quantity he found to be sufficient. He was also ordered one teaspoonful of lactic acid in a tumblerful of water, to be taken in quantities sufficient to assuage his thirst. On the 29th of August his urine still contained sugar, was reduced, however, to 86 oz. in the twenty-four hours, his total drink being now stated to be 78 oz. This day he was ordered a bottle of diabetic koumiss in the day. Of this he, however, only drank about half a

bottle daily. On September 1—his total drink being 48 oz.—he passed 48 oz. of urine rather deeper in colour, of spec. grav. 1·025, and containing no sugar. On October 1, the patient, having continued to improve uninterruptedly, was permitted to add to his diet four so-called bran biscuits, which contain, however, a large amount of starch,¹ and a cabbage. He takes his acid regularly. His total drink is now 36 oz., his total urine passed 40 oz., spec. grav. 1·025, and no trace of sugar. On October 20, two additional bran biscuits were granted to him; and on October 25 he was permitted to breakfast on porridge and skim-milk,² the bran biscuits being stopped, and his meat reduced to 2 lbs. daily, which is found sufficient. His weight is now 10 st. 7 lbs., and his urine keeps free from sugar. He was now put under surgical treatment for a stricture of the urethra, the lactic acid being continued, and bran biscuits gradually added to his porridge and skim-milk and meat diet, till he took six biscuits in the day. His drink and urine both averaged about 40 oz. in the twenty-four hours, the urine keeping free from sugar. On November 14, his weight was 11 st. in his drawers alone, and, feeling quite well, he was discharged. He was shown at the Medico-Chirurgical Society on the evening of November 15, and has orders to report himself occasionally, so that his further progress may be ascertained.

CASE 3.—Mary A. Early, a millworker, aged 15, admitted into Ward XIII., July 18, 1871, complaining of weakness, general malaise, polyuria, and diarrhoea, states that her present illness dates only from four weeks ago, when she was seized with headache, which lasted all day, nausea, great thirst, and diarrhoea. Her appetite being unimpaired, her previous health was good, and her family history unimportant. On admission her skin was hot and dry, limbs much emaciated, height 4 ft. 8 $\frac{3}{4}$ in., weight 4 st. 11 lbs. Complains of headache and great thirst. Her tongue is covered with a slight brown fur, moderately moist. Her bowels loose, several stools being passed daily. Her urine is pale, spec. grav. 1·030, and contains a large amount of sugar; its quantity is much increased, but cannot be measured on account of the diarrhoea present. Other symptoms normal. The diarrhoea was treated with chalk and opium mixture, and ceased in a few days. Her drink was now found to vary from 100 to 170 oz. daily, and the quantity of urine passed from 120 to 180 oz. On July 27, she weighed 4 st. 7 lbs., and was placed upon an *ad libitum* allowance of meat, of which she managed to consume about 2 lbs. daily, no extras. She had a bottle of soda-water daily, and two teaspoonfuls of lactic acid in a tumblerful of water as often as desired. The very next day her total drink sank to 32 oz., and her total urine passed to 22 oz. daily; and on July 29 all trace of sugar ceased to be discoverable, spec. grav. of urine remaining at 1·030, but containing a large quan-

¹ Weighing on an average 1 $\frac{1}{2}$ oz. each.

² 1 $\frac{1}{2}$ pint of porridge made from 4 $\frac{1}{2}$ oz. oatmeal, and 1 pint of milk.

tity of uric acid and crystals of oxalate of lime; total quantity passed 20 oz., total drink 40 oz., in the twenty-four hours. After this she continued to drink with almost unvarying regularity 40 oz. in the day, passing from 28 to 40 oz. of urine, averaging 33·5 oz. daily for the three months, August, September, and October. On August 7, she weighed 4 st. 6 lb., having lost 1 lb. since being put upon her restricted diet, and on the 12th her weight remained the same. She says she feels quite well, but is unable to walk much or even stand long from a feeling of weakness across her loins. August 19.—Patient weighs now 4 st. 7 lbs., spec. grav. of urine 1·030, no sugar. On August 12, she was offered cabbage or green vegetables, which she declined, and was then allowed to get half a slice of toast in the day; but this was stopped on the 20th, on account of a slight trace of sugar which was found in the urine on that day. On August 25, the patient weighed 4 st. 8½ lbs., and was permitted to have some diabetic koumiss for drink. She did not like it, however, and only managed to drink three bottles of it between this date and October 3, when it was stopped. On September 17, patient weighed 5 st., and sugar having remained absent from the urine from August 12, she was allowed to have half a slice of brown bread daily. On September 30, patient weighed 5 st. 5 lb., a marked quantity of sugar was found in her urine, but as it was distinctly traced to her having eaten a slice of white bread and jelly which she had got from another of the patients, she was permitted to continue the brown bread. October 9.—Weighed 5 st. 7 lb. Brown bread stopped on account of slight discoloration of the urine when boiled with liquor potassæ. October 14.—Patient weighs 5 st. 9 lbs., and on 14th November 5 st. 10 lb., her height being 4 ft. 8¾ in. October 17.—The urine keeping free of sugar, the patient was allowed to have four bran biscuits in the day, which contain a notable quantity of starch; and on the 27th these were stopped, and porridge and skim-milk ordered for breakfast.¹ About the end of a week, however, a trace of sugar reappearing in the urine, the porridge was stopped, and for another week she was relegated to her meat diet, of which she takes about two pounds daily. After doing penance for one week she was again permitted to have her four bran biscuits, which she has continued to this date. November 16.—Her urine keeping free from sugar, 36 oz. in quantity, and spec. grav. 1·030.² Obviously this girl is far from being in the same satisfactory condition as Hume, but, considering her youth and the well-known obstinacy of diabetes in youthful patients, I think there is every reason to be thankful for the improvement she has made, and also strong grounds for hope that a more prolonged treatment will ultimately result in her restoration to health.

CASE 4.—U. M., æt. 25, an out-patient at the Infirmary, states

¹ Of this she only took about half a pint in all daily.

² Cases 2 and 3 have been condensed from the reports of A. J. M. Bentley, Esq., M.B., the resident physician.

that he has laboured under diabetes, so far as he knows, for three or four years, and has been frequently under treatment, without much benefit. There was a large quantity of sugar in his urine: he was ordered strict meat diet, with lactic acid and water for drink; to take not less than three, or more than four, teaspoonfuls of the acid in the day. Within a week he had gained two pounds in weight, and the sugar had sunk to a mere trace. The following week his weight remained the same; but he was fresh and hearty, the sugar a mere trace; his thirst had disappeared at once. He has been little more than two weeks under treatment; so all that can be said of him is that his case is hopeful. His stationary weight was probably due to his taking a considerable amount of exercise, at the same time restricting himself to only two pounds of meat in the day. He was ordered to take any quantity of meat he could consume; but as his time for calling has not yet come round, the result is not known.

CASE 5.—A. L., admitted into Ward V. on 19th October 1871; says he has only laboured under diabetes for nine months, but is nevertheless greatly emaciated. The lactic acid treatment in this case certainly benefited the patient—the sugar entirely disappearing in a few days. He could not, however, be prevented from breaking through the rules and indulging in bread and other forbidden luxuries, and he was therefore dismissed on 17th November.

CASE 6.—M. W., a girl aged 17, an out-patient of the Royal Infirmary, came under treatment, first, on the 3d November 1871; states that she has been ill about five months, and that she has been under treatment for three or four months, but has been getting gradually worse. She measures 4 ft. 8 $\frac{3}{4}$ in., and weighs 5 st. 2 lbs. Her urine is of a pale straw colour, and quantity large but unknown, spec. grav. 1·045, giving, with Trommer's test, a copious deposit of the red oxide of copper, and becoming of a dark mahogany colour when boiled with liquor potassæ. She was ordered a strictly meat diet, with a cupful of skim-milk for breakfast, and no other drink but water: three or four teaspoonfuls of lactic acid to be taken during the day. Nov. 11.—Urine same colour as formerly, spec. grav. 1·045; deep yellow discoloration with Trommer's test; no deposit; yellowish brown with the liquor potassæ. Has lost one pound in weight, but has had diarrhoea, more or less constantly, during the week, which may account for it. Thirst greatly lessened, and feels better. Nov. 18.—Weighs now 5 st. 5 lbs., having gained 3 lbs.; has a good appetite, and eats sometimes as much as 3 lbs. of meat during the day, and always 2 $\frac{1}{2}$ lbs., besides a cup of skim-milk for breakfast; has now no thirst, and feels and looks fresh and well. Her urine is of a pale yellowish colour, acid, spec. grav. 1·030, giving a yellowish colour, and no deposit, with Trommer's test, and only a pale straw coloration with liquor potassæ. This girl, considering her youth, is obviously progressing favourably,

and I hope to be able to give a good account of her at a future period.

CASE 7.—R. A., æt. 35, has suffered from polyuria for at least nine months, and has gone down from 10 st. to 8 st. 11 lb., his height being 5 ft. 10 in. He has such intense thirst that his tongue cleaves to the roof of his mouth, and the more he drinks the thirstier he gets; voracious appetite, and digests well; bowels costive, skin dry, and feels always chilly. Has no sexual desire, and has great languor both of body and mind. For the last three months has been subject to repeated attacks of an epileptiform character; his eyes seeming to go out of focus, and consciousness to be partially lost for a second or two; these attacks occur on the street occasionally, but most frequently on getting out of bed in the morning, or just after taking a cold bath. October 14.—Urine pale-coloured, quantity large but unknown; spec. grav. 1.040; contains a large amount of sugar. Ordered a strict meat diet, with beef-tea or plain soup if desired; three to four teaspoonfuls of lactic acid in water during the day, a little whisky and water at night, with claret during the day if desired, and also a bottle of diabetic koumiss, or as much of it as can be taken. The stimulants were permitted as the patient had a good deal of moving about before him, and his condition obviously required them. Within a week he felt much better, his thirst quite gone—in fact, he complained of having, as he thought, too much to drink; and he had gained two pounds in weight. On the 27th of October he weighed 9 st. 3 lb., was free from thirst, his drink amounting to 56 oz.; his urine was 66 oz., spec. grav. 1.028; and, on being boiled with liquor potassæ, its colour closely resembled No. 4 of Vogel's table of urinary colours. He was now permitted to add fowls, fish, and eggs to his diet, which had been hitherto strictly limited to beef and mutton, boiled or roast. On the 10th of November, his weight was 9 st. 5½ lb.; and the average amount of urine passed during the fortnight averaged 56 oz., of an average spec. grav. of 1.033. On 14th November, however, he passed 30 oz. of urine at once in the morning, double his ordinary quantity; and on the 15th it was found to be of a pale amber colour, acid, spec. grav. 1.032, and gave a slight trace of sugar with Trommer's test, and a slightly darker tint than on the last occasion with the liquor potassæ. Obviously, some article in his diet was disagreeing; he was inclined to blame the koumiss, or perhaps the eggs, of which he had taken eight in one day; while I suspected he had got flour of some sort accidentally introduced into his food at some hotel. Be that as it may, however, he was at once again placed on a rigid meat diet, and already his urine has gone down one half. He looks and feels well, and is now almost free from his nervous symptoms, having only once had a slight threatening since coming under treatment.

These cases are very imperfect, and are only published on account of the importance and novelty of this mode of treating this

hitherto so intractable disease, in the hope of enlisting others in the same inquiry, and thus more speedily determining its real value. This treatment is simple, physiological, and its results—viewing them as an unselected and continuous series—are certainly sufficiently remarkable to demand attention, being far before anything I have hitherto been able to attain by any other method whatever.

The lactic acid I have employed has been that obtained from the druggists, fluid, not syrupy, of a spec. grav. of 1.027, and with the ordinary musty smell of sour milk. Three to four drachms in the day seem to be quite sufficient for all practical purposes; yet much more may be taken without detriment,¹ cases 2 and 3 occasionally taking as much as eight or nine fluid drachms in the day. The remedy is, however, as yet rather too expensive to be employed in larger doses than are absolutely necessary, as it costs ten shillings a pound; a more extended application will, of course, speedily cheapen its production.

The great advantage of this treatment is the prospect which it holds out of a comparatively speedy restoration to ordinary mixed diet, with persisting absence of sugar from the urine—of rapidity of cure, in short; and this rapidity is in itself a great encouragement to such patients steadily to persevere, in spite of the irksomeness of a diet rigidly restricted to meat, which seems certainly to be required for two or three weeks at least, after which, fish, fowl, and green vegetables may be added, and other relaxations gradually and cautiously permitted, provided the case progresses favourably. I fancied that the koumiss was of considerable benefit in Hume's case, and if its composition be correctly stated, it ought to be a useful diet for diabetics, but a rigid analysis is still requisite. It is prepared by Chapman of Duke Street, London, and is said to consist of milk, fermented in a warm place by the addition of a small quantity of very sour milk; it effervesces slightly, and is pleasant to the taste, being apparently composed of the caseous matter in a state of extremely fine division, lactic acid, and a certain amount of alcohol, besides the fatty matter and salts ordinarily present in milk. The only apparent drawback to it is the statement that in cold weather it may act as a diuretic—an action which is certainly not required in diabetes.

Bonthron's diabetic biscuits are perfectly palatable, and I fancied they might prove a welcome addition to the very limited dietary permissible under Cantani's treatment. They are said to be prepared from finely-ground bran, washed as free from starch as possible, and mixed with albumen and butter. I procured some of these biscuits, and had them analyzed by Dr Stevenson Macadam, of Edinburgh; and the analysis, which I append, shows them to be wholly inadmissible in the early stages of this treatment, while,

¹ In particular, I have never seen any rheumatic pains produced; and if the acid be kept within proper physiological limits, it is impossible that they ever can be, otherwise we would all be rheumatic.

after a certain stage has been reached, they are not required, the ordinary bran biscuits of the shops, which are much more palatable, being perfectly sufficient, and forming an admirable introduction to more mixed dietary.

*Analysis of Sample of Bonthron's Diabetic Biscuits, received from
Dr G. W. Balfour.*

Moisture,	.	.	.	18.84
Oil,	.	.	.	6.06
Albuminous compounds,	.	.	.	35.56
Starch, with some gum	}	dextrin	}	34.58
and sugar,				
Woody fibre,	.	.	.	3.84
Ash,	.	.	.	1.12
				<hr/>
				100.00

Nitrogen, 5.69

Phosphoric acid in ash equal to
ordinary bone phosphate, 0.78

(Signed) STEVENSON MACADAM, Ph.D.

ANALYTICAL LABORATORY, SURGEONS' HALL,
Edinburgh, 16th Nov. 1871.

These biscuits, therefore, contain practically one-third of their weight of starch.

ARTICLE IX.—*On the Local Effects of Crude Paraffin.* By ALEX. OGSTON, M.D., Aberdeen.

THE Messrs Miller's Chemical Works at Aberdeen have afforded the opportunity for collecting the following information concerning the appearances produced on the skin of those engaged in the manufacture of paraffin, which seems of sufficient interest to warrant being recorded :—

The workmen engaged in this manufacture have the skin over portions of their bodies, more especially of the hands and arms, but also of the feet and legs, brought daily for many hours at a time into contact with the paraffin shale, and with the oily matters mixed up with it, the result being an eruption of nodules and pimples on the skin so exposed, speedily breaking out on those who are for the first time engaged in it, lasting for a few weeks or months, and then generally diminishing or disappearing. In a few exceptional individuals the eruption does not disappear, but, assuming a chronic