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CASES OF DIABETES,
ILLUSTRATING THE
EFFECTS OF CERTAIN MODES OF TREATMENT
ON SOME OF THE
SYMPTOMS OF THE DISEASE.

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CASES OF DIABETES, &c.

It is proposed in the following essay to examine the effects of some medicines frequently employed in diabetes, by means of an analysis of the cases where they have been employed. Such an object requires no long preface; it will be requisite, however, before entering on these cases, to explain the mode of calculation which is employed throughout them, and to prefix to the whole those observations of which the reader would otherwise have to be reminded in each case.

With regard to the amount of food and drink taken daily by the patients, it has been thought advisable not to pretend to greater accuracy than the observation really possesses; so although in several of the cases the actual amount of fluid and solid matters daily consumed had been calculated, it was thought better to present this amount generally as food and drink according to the common mode of speaking, where at least the whole amount is not far from accurate, than to speak of decimal parts of ounces where there were grounds for doubting the correctness of the integers. The aggregate amount is tolerably correct, and though the division into food and drink, here adopted for the above reasons, does not coincide with the exact division of fluid and solid, yet an approximation can be made where desirable, from the data prefixed to any change of diet;—the tables appear forbidding enough in their present form without the long daily dietary with which the original notes are encumbered.

Suspicion attaches to the accuracy of the estimate of the daily quantity of urine from the frequent recurrence of whole numbers;—may be the small quantity which remained at last after measuring was put on to the next day's account; at all events, the same frequent recurrence of round numbers is noticeable in the cases that were most carefully taken. The round numbers in the daily estimate of drink, result of course from the quantity of drink being regulated. The specific gravity was generally taken by the

common hydrometer at 60° Fahrenheit, or at the temperature of the ward, the specimen examined being not taken by chance, but out of a large quantity, so as to insure a fair average. From this and the amount passed, the daily amount of solids was calculated according to the formula given by Dr Christison. (Lib. Med. vol. iv. p. 248.*)

The frequency of the pulse was noticed, perhaps erroneously, as the most easily ascertained single fact by which the state of the constitution from day to day could be registered.

While the lengthened details of the tables, and especially in the first case, require some apology, another is yet more needed, for the facts that are not given relative to the history of the patients while under other observation, again especially in the first case, But it is hoped that the cases may be useful, since they are now published in the same view with which they were collected, namely, to illustrate the effects of some medicines on the most obvious symptoms of the disease; of the imperfections none can be more fully aware than the author, the inaccuracies, which cannot but exist in the single observations, he would hope to be diminished, where not excluded by the averages.

And lastly, should the conclusions seem weak and unworthy of the pains that have been taken to establish them, the facts on which they are founded are here presented to the reader, which possibly, by the aid of more extended observation, may give origin to more numerous and more certain inferences. The subject of diabetes is already in far too able hands for the author to hope to throw any light on the pathology of the disease. The present paper merely relates the history of some patients with diabetes, stating what was done for their relief, and endeavouring to ascertain with what result; a humble contribution in the field where, among so many observers, the talent and industry of Dr Percy† of Birmingham are so conspicuous.

Diabetes treated by Creasote, St Bartholomew's Hospital.

CASE I.—William Bell, February 1843, under Dr Roupell, a middle aged man, of an ordinary sized frame of body, but thin, and with a cachectic look, much increased by the loss of the bones of his nose; a gold chaser, exposed to great heat, and to the fumes of carbonic acid in his trade; has always enjoyed remarkably good health till last August. At that time his digestion was impaired, and his bowels confined; his tongue used always to

* The correctness of this formula has been shown by Dr Day, *Lancet*, 1841. Vol. i. p. 369.

† Not to have quoted these authors must not be interpreted into any disparagement of their labours on my part. A very full recent bibliography of diabetes is subjoined to Dr Bell's Essay on that disease, translated by Mr Markwick. 12mo. London, 1842.

have a broad brown streak as if he had been chewing tobacco, as he says, and he had a sudden aversion to eating fat, to which he had before been very partial. He had thirst and frequent calls to pass his urine, and a white stain appeared on his clothes where ever it might have chanced to fall, which parts, by exposure to heat in the exercise of his trade, became rotten and brittle.

He was admitted February 15, but no account of his symptoms has been preserved beyond the daily record in the accompanying tables. There is no reason to think that he was much different from the condition in which he is reported to have been on the 3d of July, the date of this note.

On that day, which is taken as a fair average of his general condition, he was cheerful, taking great interest in his complaint, and rendering great assistance in the construction of the table annexed. Tongue clean and moist; bowels habitually costive. From time to time *confervæ* have been noticed with the evacuations from his bowels. He sweats a good deal on taking food or drink of any kind. His thirst still remains; his appetite is good; and he has no pain in his stomach or difficulty of digestion. He is liable to swelling of his feet at evening, his legs are thin, but his strength is much increased since admission, so that he can walk up stairs without difficulty.

It is noted on August 15, that some of his sweat was examined without any sugar being found in it.

He was treated by creasote, gradually increased from four minims to eight or ten minims twice a-day.

His weight increased from 106 lbs. to 121 lbs. during the time that he was under observation.

His diet consisted of bread, 4 ounces; meat, 32 ounces daily, which he continued all along; milk, 40 ounces, for half of which 20 ounces of beer were substituted on April 18th, with variable quantities of tea and water.

To those who take a special interest in the pathology and treatment of diabetes, and it is to be feared that none others will look into the following rows of figures, it is needless to point out the imperfections of the account of the patient here preserved. But with all its imperfections, it is presented as giving some idea of the nature of the patient on whom the observations were made.

Besides the general remarks on the accompanying tables, this particular series requires a few comments. For the data from which the table is made, I am much indebted to Dr Roupell's clinical clerk, and in the early part especially to my friend Mr Pooley. The specific gravity was taken uniformly at a temperature of 60° Fahrenheit. The number of the pulse was always taken under nearly uniform circumstances, about 11 A. M. and in the upright position.

Date.	Food in ounces.		Urine in ounces.			Pulse.
	Fluids.	Solids.	Fluids.	Solids.	Sp. gravity.	
Feb. 16	120	36	150 <i>c.</i>	13.9 <i>e.</i>	1040 <i>g.</i>	94
17	100	—	110	9.7	38	86
18	90	—	120	10.6	38	90
19	110	—	120	10.6	38	90
20	100	—	130	10.8	36	94
21	140	—	80 <i>d.</i>	6.1 <i>f.</i>	33 <i>h.</i>	104
22	130	—	120	8.9	32 <i>h.</i>	104
23	130	—	120	9.5	34	96
24	130	—	80 <i>d.</i>	7.2 <i>f.</i>	39 <i>g.</i>	112
25	110	—	80 <i>d.</i>	6.9 <i>f.</i>	37	98
26	140	—	40 <i>d.</i>	3.1 <i>f.</i>	34	112
27	140	—	70 <i>d.</i>	5.7 <i>f.</i>	35	96
28	120	—	50 <i>d.</i>	4.1 <i>f.</i>	36	100
March 1	130	—	120	10.3	37	98
2	120	—	140 <i>c.</i>	12.0 <i>e.</i>	37	96
3	120	—	120	10.0	36	90
4	110	—	123	10.3	36	94
5	130	—	130	11.2	37	96
6	110	—	110	8.7	34	88
7	110	—	110	9.2	36	144
8	120	—	110	9.9	39 <i>g.</i>	96
9	110	—	110	8.9	35	100
10	120	—	130	10.8	6	96
11	120	—	130	10.8	6	90
12	130	—	122	10.2	6	98
13	120	—	110	8.9	35	90
14	130	—	122	9.6	4	90
15	140	—	140 <i>c.</i>	11.4	35	98
16	120	—	120	10.	36	96
17	100	—	103	8.6	36	100
18	120	—	110	9.2	36	102
19	110	—	90 <i>d.</i>	7.9 <i>f.</i>	38	102
20	110	—	140 <i>c.</i>	12.0 <i>e.</i>	37	96
21	110	—	80 <i>d.</i>	6.9 <i>f.</i>	1037	90
22	140	—	90 <i>d.</i>	6.8 <i>f.</i>	33 <i>h.</i>	96
23	100	—	110	9.9	39 <i>g.</i>	96
24	120	—	80 <i>d.</i>	6.6 <i>f.</i>	6	104
25	110	—	80	×	×	96
26	120	—	80	×	×	94
27	120	—	90	×	×	94
28	120	—	122	10.5	1038	96
29	130	—	80 <i>d.</i>	6.9 <i>f.</i>	37	92
30	140	—	140 <i>c.</i>	11.4	35	98
31	110	—	80 <i>d.</i>	7.2 <i>f.</i>	39 <i>g.</i>	90
April 1	110	—	60 <i>d.</i>	5.5 <i>f.</i>	40 <i>g.</i>	100
2	120	—	110	9.4	37	102
3	110	—	100	8.6	37	96
4	120	—	110	9.7	38	104
5	110	—	100	9.0	39 <i>g.</i>	100
6	120	—	100	8.8	38	98
7	120	—	100	9.0	39 <i>g.</i>	96
8	140	—	120	10.0	36	98
9	120	—	120	10.3	37	90
10	140	—	130	10.8	36	94

Date.	Food in ounces.		Urine in ounces.			Pulse.
	Fluids.	Solids.	Fluids.	Solids.	Sp. gravity.	
11	150 <i>a.</i>	36	140 <i>c.</i>	11.4	35	96
12	130	—	120	10.3	37	96
13	140	—	130	10.8	36	98
14	150 <i>a.</i>	—	140 <i>c.</i>	11.4	35	90
15	150 <i>a.</i>	—	140 <i>c.</i>	11.0	34	96
16	160	—	150 <i>c.</i>	11.9	34	100
17	130	—	140 <i>c.</i>	11.0	34	96
18	140	—	110	9.4	37	98
19	130	—	123	10.5	37	94
20	160	—	140 <i>c.</i>	12.3 <i>e.</i>	38	96
21	150 <i>a.</i>	—	140 <i>c.</i>	10.7	33 <i>h.</i>	98
22	130	—	110	8.9	35	92
23	150 <i>a.</i>	—	140 <i>c.</i>	11.0	34	98
24	150	—	130	9.6	1032	100
25	130	—	104	8.9	37	90
26	140	—	120	9.5	34	98
27	150 <i>a.</i>	—	80 <i>d.</i>	6.1 <i>f.</i>	34	102
28	140	—	120	9.2	33 <i>h.</i>	100
29	140	—	130	10.5	35	92
30	150 <i>a.</i>	—	130	10.8	36	100
May 1	150	—	124	10.6	37	108
2	150 <i>a.</i>	—	130	11.5	38	100
3	150 <i>a.</i>	—	140 <i>c.</i>	11.7	36	104
4	140	—	120	10.3	37	92
5	140	—	120	10.6	38	94
6	150 <i>a.</i>	—	140 <i>c.</i>	12.3 <i>e.</i>	38	88
7	130	—	110	9.9	39 <i>g.</i>	92
8	120	—	130	10.5	35	96
9	130	—	120	9.7	35	100
10	130	—	120	10.3	37	96
11	130	—	120	11.1	40 <i>g.</i>	100
12	140	—	124	10.6	37	92
13	130	—	120	10.0	36	104
14	140	—	130	10.8	36	104
15	140	—	120	9.7	35	100
16	150 <i>a.</i>	—	150 <i>c.</i>	12.9 <i>e.</i>	37	100
17	140	—	140 <i>c.</i>	11.4	35	104
18	120	—	120	10.6	38	108
19	130	—	125	10.1	35	100
20	120	—	110	9.2	36	104
21	120	—	120	10.0	36	104
22	130	—	120	10.0	36	100
23	150 <i>a.</i>	—	140 <i>c.</i>	11.4	35	112
24	150 <i>a.</i>	—	150 <i>c.</i>	11.9	34	108
25	150 <i>a.</i>	—	140 <i>c.</i>	11.4	35	112
26	130	—	120	10.0	36	104
27	140	—	140 <i>c.</i>	11.4	35	108
28	130	—	130	10.5	1035	100
29	130	—	130	10.8	36	104
30	130	—	140	11.4	35	100
31	150 <i>a.</i>	—	140	11.4	35	108
June 1	130	—	130	10.2	34	96
2	130	—	140 <i>c.</i>	11.0	34	112
3	150 <i>a.</i>	—	140 <i>c.</i>	11.0	34	108

Date.	Food in ounces.		Urine in ounces.			Pulse.
	Fluids.	Solids.	Fluids.	Solids.	Sp. gravity.	
June 4	150 a.	36	140 c.	11.4	35	104
5	130	—	110	8.7	34	96
6	150 a.	—	140 c.	10.7	33 h.	108
7	150 a.	—	140 c.	11.4	35	112
8	150 a.	—	150 c.	12.2 e.	35	112
9	140	—	150 c.	12.5 e	36	100
10	160 a.	—	145 c.	11.8	35	104
11	120	—	140 c.	11.0	34	116
12	120	—	140 c.	11.4	35	112
13	140	—	140 c.	11.4	35	108
14	140	—	140 c.	10.7	33 h.	116
15	150 a.	—	135	10.0	32 h.	116
16	130	—	140 c.	10.7	33 h.	120
17	140	—	140 c.	11.4	35	116
18	140	—	100	8.1	35	102
19	90 a.	—	90 d.	7.4 f.	36	116
20	130	—	140 c.	10.7	33 h.	120
21	140	—	120	9.7	35	106
22	130	—	110	8.9	35	100
23	120	—	110	8.9	35	112
24	130	—	110	8.7	34	108
25	110	—	110	8.9	35	116
26	120	—	100	8.3	36	104
27	120	—	105	8.7	36	120
28	120	—	115	9.6	36	112
29	110	—	100	8.3	36	112
30	120	—	110	8.9	35	116
July 1	100	—	95 d.	8.1	1037	120
2	110	—	100	8.3	36	112
3	100	—	90 d.	7.9 f.	38	112
4	120	—	110	9.7	38	116
5	120	—	110	9.4	37	118
6	120	—	120	9.7	35	116
7	120	—	115	9.3	35	112
8	120	—	120	10.0	36	16
9	120	—	110	9.7	38	112
10	110	—	95 d	8.1	37	116
11	120	—	110	8.9	35	108
12	140	—	130	10.8	36	116
13	130	—	120	10.0	36	108
14	120	—	105	9.0	37	120
15	120	—	110	9.2	36	108
16	130	—	120	10.3	37	112
17	130	—	120	10.6	38	100
18	140	—	110	8.9	35	116
19	120	—	90 d.	7.7 f.	37	120
20	90 a.	—	80 d.	7.2 j.	39 g.	112
21	90 a.	—	80 d.	6.4 f.	35	112
22	90 a.	—	90 d.	7.9 f.	38	110
23	100	—	100	8.3	36	96
24	100	—	100	8.8	38	110
25	110	—	105	8.7	36	120
26	110	—	100	8.6	37	116
27	110	—	90 d.	7.7 f.	37	112

Date.	Food in ounces.		Food in ounces.			Pulse.
	Fluids.	Solids.	Fluids.	Solids.	Sp. gravity.	
July 28	110	36	100	9.0	39 g.	96
29	120	—	110	9.4	37	116
30	110	—	110	9.4	37	116
31	120	—	110	9.4	37	120
Aug. 1	100	—	110	9.4	37	118
2	110	—	110	9.7	38	110
3	120	—	110	7.6 f.	30 h.	114
4	100	—	100	8.3	1036	102
5	110	—	110	9.4	37	92
6	110	—	90 d.	7.9	38	92
7	100	—	120	10.0	36	100
8	100	—	100	8.8	38	102
9	110	—	110	9.9	39 g.	106
10	120	—	120	9.7	35	92
11	110	—	110	9.4	37	116
12	120	—	110	9.4	37	92
13	120	—	100	8.6	37	92
14	120	—	110	9.4	37	92
15	130	—	110	8.9	35	92
16	130	—	110	8.9	37	96
17	130	—	115	9.6	36	102
18	120	—	95 d.	8.4	38	100
19	130	—	110	9.7	38	100
20	120	—	100	8.8	38	100
21	130	—	110	9.7	38	100
22	120	—	110	9.7	38	100
23	120	—	110	8.9	35	94
24	130	—	110	9.7	38	112
25	130	—	130	10.8	36	110
26	140	—	140 c.	11.4	35	80
27	100	—	100	8.8	38	100
28	110	—	110	9.7	38	100
29	120	—	100	8.8	38	100
30	130	—	110	9.4	37	100
31	130	—	120	9.7	35	102
Sept. 1	120	—	110	9.4	37	100
2	130	—	100	8.6	37	100
3	130	—	100	8.6	37	100
4	120	—	90 d.	7.9 f.	38	104
5	110	—	100	8.6	37	100
6	120	—	100	8.3	36	100
7	120	—	110	9.2	1036	108
8	90 b.	—	100	8.3	36	100
9	110	—	100	8.6	37	116
10	120	—	120	10.0	36	100
11	120	—	110	9.4	37	116
12	110	—	100	8.8	38	112
13	110	—	110	9.4	37	100
14	120	—	110	9.7	38	100
15	120	—	110	9.4	37	100
16	120	—	110	9.4	37	116

For the sake of a more accurate comparison of his condition on admission, and when discharged, the mean of the observations made on the first and last 20 days of his stay in the hospital is here presented.

	Food.		Urine.			Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Sp. grav.	
First 20 days,.....	119.5	36	101.1	8.9	1036	99.1
Last 20 days,.....	118.0	36	106	9	1036.9	103.7

From this comparison it is clear that the disease had advanced. The quantity of fluid drunk is certainly smaller in the last series of observations, but the quantity of urine passed bears a larger ratio to it; and while the quantity of solids and the specific gravity are also higher, the greater frequency of the pulse would appear to denote that the action of which the results are here recorded was felt hurtfully by the system at large. It may be questioned whether the creasote had done anything towards checking the disease; it had certainly done nothing towards curing it.

But it would be unjust to conclude from the examination of this part of the table only; for although we do not know what was the habitual standard of the fluids drunk or secreted before the creasote was employed, yet the averages are so much lower at the beginning than at any later period in the table, that it may be suspected that the regimen, if not the creasote, produced a sudden temporary amelioration, which it would be very unfair to regard as a sample of his condition at the worst. And if we select a later period, when the immediate effects of this regimen might have worn off, we find a much more striking contrast between that and the last 20 days. Taking for this purpose from April 8 to April 27, both inclusive, we have,

	Food.		Urine.			Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Sp. grav.	
Second 20 days,.....	142	36	126.3	10.2	1035.2	100.5
Last 20 days,	118	36	106.0	9	1036.9	103.7

which would give a rather higher idea of the powers of creasote in checking diabetes. But remembering Huxham's suggestion, that "surely what we use by ounces and pounds cannot but considerably affect us, as well as what we take by grains and scruples," (Preface, p. xiii.) it is but fair to state also the converse view of the case, that the creasote might have produced a sudden effect which afterwards wore off, while the diet produced a steady amendment.

Which of these two views be correct there is not evidence to show in the present case.

This period has not been selected only as displaying to the eye a high average in the solid contents of the urine, but as illustrating a point in treatment; for after April 18, the middle of this period, 20 ounces of common beer were substituted for 20 ounces of milk, with what result the accompanying summary shows.

	Food.		Urine.			Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Sp. grav.	
Mean of the first half,	141	36	133	10·8	1035·4	104·4
... .. second,	143	36	119·7	9·6	1035·1	96·6

But an important source of error lies in the difference of the external temperature when the patient was discharged, from what it was on his admission. On this question another series of observations may throw some light; for the present, we can only conclude that the effect of creasote, added to careful regimen, was at the most but palliative, and that the disease, though rapidly amended, and after a relapse, again, perhaps, alleviated by the steady use of the same regimen, could not be said in September to be materially altered for the better from what it was in February; rather the other way, judging from the amount of the urine passed daily.

A case like the above, submitted for so long a time to the same circumstances, presents a favourable opportunity for studying the relation which excess or defect in any of the particulars which have been registered in the tables bear to each other.

Taking the mean of 23 observations, (marked *a*,) when the quantity of fluid drunk was 150 ounces or upwards, none of which, it will be observed, occurred after June 16, and comparing it with the mean of five observations (marked *b*) when the quantity drunk was not more than 90 ounces, which observations, it will be seen, are chiefly made during the later periods, we have

	Food.		Urine.			Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Sp. grav.	
<i>a</i> . 150 ounces and more, ..	150·4	36	137·3	11·2	1034·7	98·9
<i>b</i> . Not more than 90 ounces.	90	36	88·0	7·4	1036·8	110

The amount of fluid drunk lost by exhalation, or anyhow which does not appear as urine, is nearly the same in both cases, but the slightly higher ratio that the solid contents of the urine bear to the amount of fluid, the greater specific gravity, and the increased frequency of the pulse, incline to the belief, that the diminution

in the quantity of fluid drunk was owing to no essential amendment of the disease.

The next point to examine is the relation of a rise or fall in the amount of urine passed to the other particulars. Here there are thirty-six observations (*c*) occurring chiefly about the middle period of the time that the patient continued under notice, when the quantity passed was 140 ounces or upwards, and twenty-six observations, (*d*), chiefly about the beginning and end, when less than 100 ounces were passed.

	Food.		Urine.			Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Sp. Grav.	
<i>c.</i> 140 ounces and more,	142.5	36	141.5	11.4	1034.8	103.9
<i>d.</i> under 100 ounces,	115.7	36	81.3	6.9	1036.3	104.

It will be observed that here again the ratio of the solid contents of the urine to the quantity passed is increased, (as may easily be shown by multiplying the solid contents as here registered by 12,) while the specific gravity, as might be expected, rises with the fall in the quantity of urine. But these unfavourable signs are counterbalanced by the fact, that the ratio of the urine passed to the fluid drunk is much less in the low than in the high average. It is curious to compare this ratio with that in the last average, where the urine was less because the drink was less, which tells us by force of the ratio 115.7 : 81.3, as compared with 90 : 88, that diabetes is not to be cured by abstinence from drink.

Repeating these observations on the daily amount of solid contents in the urine, there are 8 days (*e*), chiefly during the early part of the case, when the daily amount of solids was equal to 12 ounces and upwards, and 22 days (*f*), also rather more towards the beginning than the end of the tables, where the daily amount did not exceed 8 ounces.

	Food.		Urine.			Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Sp. Grav.	
<i>e.</i> 12 ounces or more,	137.5	36	157.5	12.5	1037.2	97.7
<i>f.</i> not more than 8 ounces,	115.4	36	80.4	6.7	1036.4	10 .9

The same remarks might be made as on the last average, that the second line shows a lower ratio of the quantity of urine passed to the fluids drunk than the first, but a slightly higher ratio of the solid to the fluid amount of the urine, while the greater frequency of the pulse makes one doubt the favourable import of any of the other columns.

Lastly, though at the risk of repeating what has been considered under the two last summaries, the frequent observations made in practice on the specific gravity of the urine in diabetes, require that this should here be considered in the same way as the other columns. On 13 days, (*g*), the specific gravity was 1039 and upwards; on 11 days, (*h*), it was not more than 1033. These observations form the basis of the following averages.

	Fluid.	Solid.	Fluid.	Solid.	Sp. Grav.	Pulse.
<i>g</i> , Sp. grav. 1039 or more,	115.3	36	100.7	9.1	1039.2	99.2
<i>h</i> , Do. not more than 1033,	138.1	36	123.1	9.2	1032.5	108.7

One thing this contrast shows clearly, namely, the importance of checking off the specific gravity of the urine by its quantity, the inverse variations in these two particulars nearly compensating each other. But, further, the upper line nearly negatives the conclusions arising from an examination of *d* and *f*, for we have a low amount of fluid drunk and urine passed with a high specific gravity and high proportion of solid contents, yet, withal, the pulse is 99 instead of 104.

Only one conclusion seems admissible from the whole, that the cure of diabetes must be tested by amendment in at least all these particulars, for what may be considered in itself as a sign of amendment, may, when brought into comparison with the other particulars, bear quite another meaning. A new field of observation seems opened by the comparison of the results of these analyses together; but, as little more would arise from such a proceeding than from the comparison of similar results of single days, we pass on to the next case.

Diabetes treated by Creasote. Experiments on Digestion, St Bartholomew's Hospital.

CASE II.—John Osborn, 21. March 27, 1841, under Dr Roupell. Thin, wiry looking, dark complexion and hair, weighing 97.5 lb.; abdomen distended; tongue clean, red, with fissures round the edges and across the back, moist; gums red and clean; pulse 68, soft; bowels confined; skin dry and harsh, but at night profusely perspiring; has thirst and diuresis of six months.

History.—Healthy and of healthy parents, a messenger, living in London, of temperate habits, has suffered from over work, but never from want. Six months ago, thirst and diuresis gradually came on with feverish symptoms. For these and the rapid emaciation with which they were accompanied he was treated at the Brighton Hospital, and his urine fell under that treatment from 19 to 12 pints *per diem*, at sp. grav. 1028. He used then to eat 14 ounces of bread daily, and a large amount of sugar, to which last

he is very partial. On a fresh accession of his disease he was treated at the Westminster hospital, and his urine reduced from sp. grav. 1037 to 1028, still at 12 pints. He left the hospital much improved in health, and after staying at home a week was admitted here.

His appetite is voracious, he cares little for bread, but likes meat, and especially fat. He suffers from no pain in the stomach, but has at times headach, not more, however, during the last six months than previously. His teeth are certainly much decayed, but his hair does not come out. His lungs present no morbid signs on auscultation. He passes daily 11 pints of urine at sp. grav. 1035, stiffening his clothes where it falls upon them.

The daily notes have chiefly reference to the various experiments that were made upon him, he having the singular power of spontaneous vomiting, which he accidentally discovered himself to possess at the age of eight years. It is noticed on April 2, that he had almost lost his appetite, apparently from the distress it caused him to learn that he had lost weight. On April 3, he noticed as a singular thing, that he had two nocturnal emissions; but besides this, till his discharge on May 2, no other remark was made upon him independent of the experiments, the results of which are subjoined.

1. The mucus of the stomach contained no sugar.
2. A mixed meal of beef and bread fermented freely on the addition of yeast.
3. Six ounces of beef vomited after an hour gave not a trace of sugar.
4. One ounce of fat vomited after an hour and a half gave perhaps a trace of sugar or of some analogous substance.
5. Three ounces of bread vomited after three-quarters of an hour were found to contain abundance of sugar.
6. Two ounces of arrow root with cold water vomited after one hour's digestion gave no evidence of the presence of sugar.
7. Half an ounce of isinglass vomited after half an hour was equally uninfluenced by the tests for sugar.

Thus it would seem that the natural mucus of this man's stomach contained no sugar, and that he had no greater power of converting other substances into sugar than is possessed by ordinary individuals. Some of this mucus under the microscope seemed made up of lamellar, with some cylindrical epithelium scales, and numerous small bodies of $\cdot 0021$ inches long by $\cdot 00035$ broad, pointed at each end, and displaying some indistinct longitudinal striæ. These were clearly distinguished from little bits of fat and muscle, and some irregular granular bodies, the remains of the previous evening's meal. It should be observed, that all these experiments were made the first thing in the morning, on a stomach, therefore, as empty as possible.*

* Though it does not fall within the scope of this essay to discuss questions on

He took great interest, and rendered all the assistance in his power in conducting these experiments, as well as in the construction of the subjoined table. His diet consisted of bread, six ounces; meat, thirty-two ounces, (in the different quantities of which last the chief difference in the daily consumption of solids lies); and four eggs, which are reckoned at eight ounces. The treatment consisted throughout of two minims of creasote, with half an ounce of distilled vinegar thrice a-day, and compound extract of colocynth, of which ten grains had latterly to be taken twice daily, to ensure a regular action of his bowels.

Date.	Food.		Urine.			Weight.
	Fluids.	Solids.	Fluids.	Solids.	Sp. Grav.	
Ap. 3	150	26	200	17.7	1037	97.5 lb.
5	170	34	240	16.4	1030	
6	120	46	180	12.5	30	
7	160	18	200	17.7	38	
8	120	46	190	13.2	30	
9	100	—	180	12.5	30	
10	110	—	180	12.5	30	
11	130	—	190	13.2	30	
12	130	—	200	15.3	33	
13	130	—	190	14.1	32	
14	140	—	210	16.1	33	
15	130	—	220	16.9	33	
16	130	—	200	15.3	33	98 lb.
17	100	—	160	13.0	35	
18	120	—	190	14.8	33	
19	110	—	180	13.8	33	
20	100	—	170	13.0	33	
21	80	—	140	11.7	36	
23	100	—	170	13.8	1035	99 lb.
24	110	—	180	14.6	35	
25	140	—	200	13.9	30	
26	110	—	180	13.8	33	
27	100	—	170	13.4	34	
28	120	—	190	15.9	36	
29	80	—	140	10.4	32	99 lb.
30	100	—	160	13.0	35	
May 1	100	—	160	12.0	32	
2	110	—	160	12.2	33	

the nature of diabetes, which, moreover, have already been treated by other observers, the author cannot pass on without noticing the difference between these results and those published by Mr M'Gregor (*Medical Gazette*, Vol. xx. p. 270.) Since no sugar was found in the products of experiments 1, 2, 3, 6, 7, it is pretty clear that no sugar existed in the natural secretions of the stomach in this case, else it would have appeared with, though not itself being, the product of the digestion in these experiments. But even had sugar been found in 2, 3, 6, 7, it would not, therefore, have been proved that the substances experimented on had been converted into sugar, for the sugar might have come from the blood, where Mr M'Gregor has so clearly shown it to exist, for the presence of the alimentary matters might have induced its secretion into the stomach, although, under ordinary

The above is not long enough for any general inferences to be drawn from it as to the tendencies of the disease in the particular instance, but as an experiment (for all our treatment of diabetes, in a curative point of view, is no better) of a month's duration, the comparison of the condition of the patient at the beginning, and at the end of the time, is of interest.

There are complete observations on twenty-eight days, for it took some time before he could be got to furnish the data with accuracy.

The average was	Food.		Urine.		
	Fluid.	Solid.	Fluid.	Solid.	Sp. Gravity.
On the first 14 days,	115·7	41·7	195·7	14·6	1032·4
On the last 14 days,	98·6	46·0	170·7	10·4	1033·5

Is the difference so great that we can ascribe any especial power to creasote over diabetes? There clearly is a difference in the four first columns more than sufficient to outweigh the slight disadvantage which the other column exhibits; but even had an opinion of the virtues of creasote been raised by the previous case, it must be confessed that this case would go far to counteract that opinion, since a month of dieting and creasote could do no more than that.

There is one particular which, in the present case, must not pass unnoticed, though the unwieldy length of the former one will not allow an exact comparison. It will be seen there by the tables, or more readily by consulting the averages, that the quantity of urine passed rarely exceeded the quantity drunk, even without adding in the quantity of fluid contained in what is usually called solid food, (which must be set down at something like three-fourths of its weight); while in the last such was regularly the case, and while the fluid drunk during the twenty-eight days amounts to 3200 ounces, the urine passed during the same period was 5130 ounces; or even adding 950 ounces, (a rough estimate of three-fourths of the weight of the solid food), we have 4150 ounces : 5130 ounces, the ratio of the fluid drunk to the fluid secreted. It is hardly to be wondered at that he had a dry skin by day time, for all this time he was gaining weight. We shall again have occasion to refer to this.

circumstances, the sugar was separated from the fluid, which passed from the blood to form that secretion. It must be recollected, however, that this patient possessed the power of spontaneous vomiting. He drunk a little water, that the stomach might have something to contract upon, and immediately, if he wished, rejected all that was in his stomach. Perhaps in this fact lies the solution of the difference between the results of Mr M'Gregor's experiments and those just related; but I have now lost sight of this patient since it occurred to me to try the effect of an emetic of sulphate of zinc upon him, as employed in Mr M'Gregor's experiments.

In the middle of June this patient accidentally fell again under notice. He was then at work, ate bread or any thing that came in his way, feeling languid, perspiring profusely, passing about 150 ounces of urine daily of sp. grav. 1028, distinctly saccharine.

In comparing this single observation with the more numerous and accurate ones made during his stay in the hospital, lest we should jump at once to too favourable a conclusion, we must not forget, that though he was living on no regular plan of diet, the confinement of an hospital had been changed for the free air, and all anxiety about employment had been removed. Unfortunately we have no case positively illustrating the relation of the state of the mind to the bodily symptoms in diabetes, though most would agree in expecting favourable results from the removal of any cause of anxiety.

The next case presents the result of more than one mode of treatment, the analytical examination of the results of which have been worked into the narrative of the case, where they do not constitute the whole of it. The fairest way of estimating the effect of any method of treatment appeared to be the comparison of the mean of its results with the mean of the results of the treatment last adopted. It is true that this does not give an exact result, but it is fairer and less liable to be warped by preconceived notions, than if single days were taken as the standard of comparison.

Throughout this and the following cases it repeatedly happens that the accurate examination of interesting particulars has been precluded by the changes of diet or medicine which the nature of the case required. In an inquiry like the present, to insure always numerous and accurate results it would be necessary to adopt a rigid system of diet and medicine, regardless of all ailments that might require it to be modified from time to time, and to suspend and return to modes of treatment, guided rather by the state of the tables than the state of the patient. It is hoped that no apology is necessary here when the effects of any single agent have been obscured by pursuing a contrary plan. The fallacies arising from these sources have, however, been noted as they occur, and the facts are given to prevent others being led away by fallacies which may have escaped my own notice.

Diabetes treated by Nitric Acid, Creasote, Opium, Hydro-sulphate of Ammonia, and Vapour-baths.

CASE III.—James Simmons, aged 13, Nov. 30, 1843. St Bartholomew's Hospital, under Dr Burrows. Pale, delicate-looking, with light hair and light blue eyes; skin of face clear and transparent with the veins showing through, but elsewhere dry and rough ;

expression dull and listless; alæ nasi and upper lip swelled and chapped; tongue moist, clean at tip and edges with elevated papillæ, a yellow streak down the centre, and irregular patches of white fur along the sides; pulse 88, small, weak, and thrilling; bowels confined; has pain in the head, and a sensation of chilliness, with voracious appetite, thirst and diuresis of about six weeks.

History.—Delicate, always ailing, more so during the few last months. Six weeks ago, on the closing of a sore on the heel, he first noticed this hunger and thirst and diuresis, and he had then also a sweet taste in his mouth, which he is not conscious of at present. Indeed all his symptoms now are less severe than they have been, and, beyond lassitude and pain in the head, there is little that he really seems to complain of.

There is generally healthy resonance on percussion; the respiratory murmur feeble in the left, and coarse in the right lung.

He was not able to keep the register of his food and urine accurately till December 4, from which time, till the patient's discharge, I am much indebted to the kindness of my friend Dr Kirkes, the clinical clerk in charge of the case, for the steady manner in which the daily report has been kept up.

In the first instance, he was allowed 13 ounces of solid animal food, and 4 ounces of bread, with 40 ounces of milk, and of other liquids as little as would satisfy his demands. He took decoction of sarsaparilla one and a half ounce, with twenty minims of dilute nitric acid thrice a-day. His bowels were kept open by ten grains of compound extract of colocynth every night, and he was to have a vapour-bath on alternate days. This plan was persisted in till December 11, as follows. It may require to be explained that the last column of the urine denotes at how many times the urine was passed.

	Food.		Urine.				Pulse.
	Fluids.	Solids.	Fluids.	Solids.	Sp. grav.	No.	
Dec. 4.	118·5	17	120	10·9	1039		75
5.	98·5	17	1 0	12·3	1044	9	76
6.	118·5	17	1 0	12·7	39	8	88
7.	108·5	15	120	11·1	40	10	78
8.	108·5	17	90	9·0	43	8	82
9.	108·5	17	130	11·8	39	10	80
10.	108·5	17	130	11·5	38	10	82
11.	108·5	29	140	13·0	40	11	78
giving an average of—							
	109·7	18·2	123·7	11·5	1040·2	9	81·1

He was now put on another plan, the former medicine replaced by one minim, and, after Dec. 14, two minims of creasote thrice a-day. He was allowed greens 12 ounces daily, (which consi-

derably raises the nominal amount of solid food,) and ordered to continue the vapour bath.

Date.	Food.		Urine.				Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Sp. Grav.	No.	
Dec. 12	104	29	70	7.0	1043	7	90
13	104	—	80	8.0	43	9	80
14	144	—	170	17.4	44	11	80
15	104	—	160	14.9	40	10	90
16	84	—	140	13.0	40	9	100
17 a.	104	—	140	13.0	40	10	100
18	84	—	110	10.7	42	8	100
19	84	—	110	11.0	43	8	106
20 a.	104	—	90	8.5	41	8	94
21	104	—	130	11.8	38	7	96
22	64	—	120	10.9	39	8	98
23 a.	64	—	140	13.7	42	9	96
24	104	—	160	13.7	37	9	100
25 a.	104	—	140	13.3	41	7	100
26	104	—	170	16.2	41	8	102
Giving in the same way an average of							
	97.3	29	128.6	12.2	1040.9	8.5	89.4

It will be seen from comparing this with the previous average, that the disease had made progress in all the particulars here recorded, except in the amount of fluid drunk, which is less; but reflecting that nearly the whole of the 12 ounces of greens should be set down as water, the difference in this respect is not so striking as it may at first sight appear. This point will bear a little more accurate examination. It appears, on adding together the averages of the two first columns in these two tables respectively, that the amounts are nearly equal, namely, 127.9 and 126.3. With this diminished amount of ingesta, slight though the change be, we have an increase in the amount of the urine, and a greater frequency of the pulse. Is this change for the worse to be attributed to the creasote, to the change in diet, or to the advance of the disease? The increase continued after the use of the creasote was suspended, whence we infer that the increase did not depend on its employment, while the amount of urine is sensibly reduced in the first average taken after the omission of the green vegetable food, so that thus far this last stands convicted. But this article seems so nearly to supply the place of an equal amount of fluid, judging from the sums of the two tables, that we do not feel disposed to admit it to have had an influence which may be solely attributable to the state of the weather, or to the progress of the disease, for this disease, like others, does not always go on evenly to its termination.

The results did not appear sufficiently satisfactory to justify the continuation of creasote by itself. For the five next days, before it was finally discontinued, the patient was ordered five grains of compound powder of ipecacuanha every night.

Date.	Food.		Urine.				Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Sp. grav.	No.	
December 27,	104	29	170	16.2	1041	9	102
... .. 28, <i>a</i>	84	...	130	12.1	40	7	106
... .. 29,	84	...	160	15.1	41	9	106
... .. 30,	104	...	170	16.0	41	9	94
... .. 31, <i>a</i>	104	33	170	15.6	40	9	...
Giving,	96	29.2	160	15	1040.6	8.6	102

But the experiment with creasote seemed altogether unsuccessful, and the sarsaparilla with dilute nitric acid was resumed. The poor lad liked this medicine so much better than creasote, that, from January 5 to January 19, he used to bring in a false account of the quantity of urine passed, in order that the supposed improvement might insure his continuing on the same plan of treatment.

Date.	Food.		Urine.				Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Sp. grav.	No.	
January 1,.....	64	33	140	13.0	1040	10	102
... .. 2,.....	108.5	...	170	15.6	40	8	106
... .. 3, <i>a</i>	68.5	...	150	15.0	43	7	104
... .. 4,.....	108.5	...	160	14.9	40	9	102
... .. 5,.....	68.5	...	120	12.0	43	8	104
Giving,.....	83.6	33	148	14.1	1041.2	8.4	103.6

The most striking difference is in the amount of fluid drunk, but as this varies so much on the different days, and is not a steady diminution, it is not to be much relied on. The amount of urine passed is also notably diminished, but the other alterations are not particularly well marked. One thing, however, is evident, that, saving the diminution of his thirst, the disease had made much progress during the interval between December 11 and January 5, as may be seen by comparing the two averages of those respective dates.

When the next table begins, he had left off the vapour-baths. His diet consisted of meat, twelve ounces; bread, four ounces; with generally milk, forty ounces; and variable quantities of other fluids. For seven days he took four ounces of wine, which we will separately consider. His medicine during the whole of this pe-

riod consisted of hydro-sulphate of ammonia, five minims, thrice daily,—a medicine for the use of which in diabetes there is a precedent in Rollo, and which was employed in this and the following case.

Date.	Food.		Urine.				Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Sp. grav.	No.	
January 20,	88.5	17	110	11.0	1043	8	112
... .. 21,	68.5	...	140	13.0	40	9	108
... .. 22,	68.5	...	110	10.5	41	8	112
... .. 23,	112.5	...	120	11.4	41	7	112
... .. 24,	92.5	...	100	9.7	42	9	108
... .. 25,	92.5	...	90	9.0	42	6	104
... .. 26,	82.5	...	90	9.0	42	×	104
... .. 27,	82.5	...	80	8.0	41	7	104
... .. 28,	82.5	...	80	8.0	41	9	108
... .. 29,	72.5	...	100	9.7	42	7	108
... .. 30,	68.5	...	120	12.0	42	6	120
... .. 31,	68.5	...	100	10.0	45	8	96
February 1,	78.5	...	110	10.0	40	9	100
... .. 2,	78.5	...	80	7.0	39	6	92
... .. 3,	68.5	...	100	9.7	42	6	100
Which gives	80.3	17	102	9.8	1041.5	7.5	105.8

a result, at first sight, more satisfactory than any of the other averages have shown; but, when we compare the successive averages, and find how, under all the forms of treatment, the thirst had been gradually diminishing, it naturally occurs that the remarkable diminution in the last average in that respect was not owing to the medicine he was taking. But hydro-sulphuret of ammonia is reputed to allay thirst in diabetes, and so far as numbers can show, his thirst certainly was much less while he was taking it.

It remains lastly to inquire into the effect of the four ounces of wine, which he took from January 23 to January 29, both inclusive; and into that of the vapour baths, which were employed so much in the earlier part of the case.

Comparing these seven days with the other days of the same period, we have for the period when he took wine an average of

Food.		Urine.				Pulse.
Fluid.	Solid.	Fluid.	Solid.	Sp. grav.	No.	
88.2	17	94.2	9.2	1043	7.5	106.8
For the other days—						
73.2	17	108.7	10.4	1041.5	7.5	105

Giving rather a curious result in the inverse variation of the quantity of fluids taken and of fluids passed; and in this respect, but almost only in this respect, allowing a favourable inference as to the effects of that small quantity of wine.*

The average of the seven days on which it is registered that he had a vapour-bath, (marked "a,") compared with the average of the seven preceding days, gives

	Food.		Urine.				Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Sp. grav.	No.	
Vapour-bath,...	104·8	30	142·8	13·	1041·	8·1	100·
Days before, ...	93·2	30·1	148·5	13·7	1040·1	8·5	100·8

Showing that his thirst was increased by that application; the ratio of the amount of fluid passed to that drunk is, however, much more favourable on those days. The data for the comparison are quite fair, as the vapour-bath used generally to be applied about an hour after the time when the daily calculation began. It should be observed, that only those seven days are made use of, as the register only states that he had vapour-baths every other day, and does not at other times specify the day.

Frankly, I cannot say that the patient derived any actual advantage from the employment of any of these means singly, any more than it appears, by comparing the beginning and the end of the case, that he derived benefit from them altogether. He drunk less, and he passed less urine on discharge than on admission; but his condition, under the most favourable circumstances, being such as is recorded in the last table, after two months' close attention, no permanent benefit was to be expected on the exchange of those attentions for the distresses of poverty. And as to the essential nature of the disease;—a single comparison of the ratio of the fluid drunk to the urine passed, gives—55 : 62 in the first, and 40 : 51, instead of 40 : 45 in the last average :—The disease had apparently made progress, though its symptoms were for a while repressed.

Diabetes treated by Nitric Acid, Opium, Creasote, Hydrosulphate of Ammonia. Death by Phthisis. Dissection.

CASE IV.—Margaret Jerrems, 23. October 19, 1843, St Bartholomew's Hospital, under Dr Burrows.—Face pale and distressed; lips hot and swelled, with small whitish vesicles beneath

* An Irish labourer, suffering from diabetes, admitted in the course of the last summer, (1846,) used to relieve his thirst with butter milk, but not finding that beverage accessible in London, he took to beer instead. He stated that he found half the quantity sufficient. It will be recollected that in Case I. a favourable inference was drawn as to the effects of the exchange of a pint of milk for an equal quantity of table beer daily.

the mucous membrane; tongue clean, dry down the centre, moist and glazy at the sides, with aphthous edges; gums swelled, rising between and in front of the teeth, which are loose, and give great pain on mastication; skin dry, harsh, never perspiring; hair dry, rough, loose, and brittle; bowels obstinately costive; catamenia suspended for a year; has diuresis, thirst, nausea, languor, and gradual emaciation of eleven months.

History.—Of a phthisical family. One sister died of diabetes at the age of 28. She has always had remarkably good health herself; is married, but has had no children. Her perfect health was interrupted eleven months ago by a constant feeling of languor and great thirst, and soon her appetite became voracious, and somewhat capricious. She began to dislike sweets of all kinds, was very fond of bitter things, but preferred bread and water to every thing else. Of meat she liked the fat better than the lean parts, and found most relief to her thirst from soda water. As she was getting worse she applied four months ago at St Thomas' Hospital, passing at that time daily twenty-four pints of urine, at specific gravity 1049. After three months' treatment, chiefly, she says, by opium, she left at her own request, passing eighteen pints, at specific gravity 1040, daily, and feeling very much better in all respects. But as she soon lost all this ground again, she applied for admission here.

She has had a cough for some months in a slight degree, but worse during the last three weeks. She never spat blood.

Auscultation.—Dulness on percussion beneath each clavicle, most marked beneath the right, with gurgling on cough, pectoriloquy, and long expiration. There is also long expiration and pectoriloquy behind.

It was not till October 24 that the table was fairly commenced, and the patient able to furnish all the details required. Her diet at that time was composed of 21 ounces of animal food, 20 ounces of greens, and 1 ounce or less of bread, with about 30 ounces of milk, and tea and water as little as she could do with. The diminution in the amount of solid food on the four last days of the first series is due to her inability to eat meat, to which she now expressed a great dislike.

She had a vapour-bath twice a-week, and compound gentian and senna mixture, with dilute nitric acid half a drachm, morning and noon, with a little of the common effervescing medicine from time to time, to allay her thirst.

Date.	Food.		Urine.			Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Sp. gravity.	
Oct. 24	149.5	42	190	12.8	1029	90
25	115.5	42	180	12.1	29	90
26	145	42	160	10.0	27	90
27	141	41.5	120	8.3	30	96
28	140	25.5	140	×	×	90
29	149	25.5	140	9.1	1028	×
30	148	11	210	10.2	21	90
31	171	19	190	9.3	21	96
Giving a mean of						
	144.8	31.0	166.2	10.2	1026.4	91.7

It should be observed that she was generally lying down when the number of her pulse was counted.

During the next period there was little difference in the quantity or quality of her food, only towards the end of it she was able to eat 16 ounces of meat. She discontinued the compound mixture of gentian, and took 1 grain of opium every night, continuing the use of the vapour-baths.

Date.	Food.		Urine.			Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Sp. gravity.	
Nov. 1	155	25	200	9.7	1021	84
2	190.5	22.5	250	13.9	24	96
3	166.5	24	210	12.2	25	108
4	160.5	16	200	10.7	23	88
5	168.5	28	200	11.6	25	108
6	170.5	32	250	14.5	25	100
7	140.5	32	230	13.3	25	104
8	160.5	32	240	15.0	27	100
Mean,	164.0	26.4	222.5	12.6	1024.3	98.5

From which it would seem that the disease was making progress.

The opium was now increased to three grains, and subsequently to six grains daily; but diarrhoea was so distressing to the patient that the daily account was suspended after November 18, and not recommenced till December. The nitric acid was suspended in November.

13th. The use of the vapour-baths was continued during both the following series of observations:—

Date.	Food.		Urine.			Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Spec. gravity.	
Nov. 9	130.5	32	250	15.7	1027	100
10	170.5	32	200	14.4	31	96
11	170.5	32	180	13.4	32	104
12	170.5	32	230	16.6	31	100
13	170.5	16	240	19.5	35	96
Mean,	162.5	28.8	220	15.9	1031.2	99.2

Comparing this mean with that of the next four days, during which the account was still kept, the most notable difference appears in the amount of solid food; but as there was a sudden diminution in this respect, before the use of the nitric acid was suspended, it cannot justly be concluded from the next average that this medicine had kept up her appetite. She also began at this time to take two ounces of brandy daily, by which or similar means in the last case the thirst seems to have been rather increased and the quantity of urine diminished. Here the thirst is diminished more palpably to the eye than appears in the average, the quantity of urine at the same time being increased.

Date.	Food.		Urine.			Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Spec. gravity.	
Nov. 15	166	16	240	19.5	1035	92
16	160	14	240	19.5	35	100
17	166	14	240	19.5	35	100
18	166	14	200	16.0	35	96
Mean,	164.5	14.5	230	18.6	1035	96.5

During this time her bowels were much relaxed, nevertheless there is an increase in the quantity of urine passed, and its specific gravity is also lighter. One would feel inclined to attribute here the increased frequency of the pulse to the nitric acid, by the same constitutional action keeping down the quantity and specific gravity of the urine; but such a conclusion must not be drawn from an average of four days, unsupported as it is by the results witnessed in the preceding case.

When the table was resumed, she had returned to the use of twenty minims of dilute nitric acid thrice a-day, with five grains of opium daily, which she continued to the 13th. Her bowels were regularly open once a-day.

Date.	Food.		Urine.			Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Spec. gravity.	
Dec. 5	164.5	33	220	17.9	1035	100
6	164.5	33	200	16.7	36	104
7	164.5	33	200	13.9	30	100
8	144.5	33	200	17.0	37	100
9	164.5	33	220	16.0	32	100
10	164.5	33	200	14.9	32	100
11	164.5	33	240	17.0	32	100
12	164.5	33	240	18.0	33	96
13	160.0	35	280	21.0	33	92
Mean,	161.7	33.2	222.2	16.9	1033.3	99.1

According to this average she seems to have reverted to nearly the same condition as about November 13th, when upon a precisely similar plan of treatment. In the next table the results of another plan of treatment are displayed, the dilute nitric acid being suspended, while the opium was continued, and two minims of creasote were given four times a-day. After the first three days the greens which she had hitherto taken were discontinued, which explains the sudden drop in the nominal amount of solids, though this really, as before noticed, should rather be put down as a diminution of the amount of fluid aliment.

Date.	Food.		Urine.			Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Spec. gravity.	
Dec. 14	160	35	150	12	1035	100
15	160	35	140	10	33	96
16	160	25	200	17	39	100
17	160	9	180	18	43	96
18	160	9	200	20	43	96
19	200	9	160	14	38	96
20	160	9	180	16	39	100
21	120	17	120	10	38	100
22	120	17	140	11.7	36	96
23	120	9	160	13	35	112
24	120	9	140	12	38	100
25	120	17	140	13.7	42	100
26	160	17	160	13	36	96
27	160	17	120	11	40	96
28	140	21	120	13	43	100
29	160	21	200	20	43	100
30	160	21	200	20	43	94
31	160	21	200	17	37	100
Jan. 4	160	21	200	20	43	100
7	160	21	180	16.3	39	112
8	160	21	160	14	38	112
9	160	21	160	13	36	104
10	160	21	200	17	37	112
Mean,	154.7	18.3	170	14.8	1038.8	100.7

This result is highly satisfactory, not as showing any change in the essential nature of the disease, but inasmuch as a prominent symptom of the disease is held in check, without this seeming to arise from any violence to the system at large, for the few notes of the progress of the case, about this time, that have been preserved, speak of the great comfort that she expressed under the use of creasote. The lad, on the other hand, used to falsify the daily account in order that he might continue the use of dilute nitric acid, which seemed to suit his feelings best.

Combining the two first columns in these two averages respectively, we have a ratio of 195 : 222, and 173 : 170, nearly, expressing the relation between the daily amount of the ingesta and of the urine; a satisfactory sequela, to use no higher word, of the employment of creasote. It will be recollected that in the last case, the diminution of thirst was the only marked beneficial change following the use of creasote; the ratio, of which we have just spoken, varies the other way in his case, being 128 : 124, and 126 : 129, respectively.

This same period will supply us with the means of investigating the relation between the amount of the various particulars mentioned and an active state of the functions of the skin, for, from December 21st to 27th inclusive, she had many free perspirations. The sum of those seven days gives, compared with the other days of this series,

	Food.		Urine.			Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Sp. grav.	
Perspiration, .	131.4	14.7	140	12.0	1037.8	100
No perspiration,	164.8	20	183.1	16	1039.2	101

A result infinitely more satisfactory than what was seen as the effect of artificially-induced perspiration in the last case. It would have been interesting to have investigated the effects of the vapour baths in this case, but unfortunately there is no record of the exact days on which they were employed.

If not wearying the reader's patience by going so often over the same ground, we would recur to this last series for the means of estimating the effect of an additional four ounces of bread daily; as, during the first fourteen days she took four, during the last nine, eight ounces of bread, as her daily allowance; the most notable variations in her diet in other respects, as seen especially about December 18, arising from her aversion to meat.

	Food.		Urine.			Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Sp. grav.	
With bread, 4 oz.	148.5	16.7	156.4	13.6	1038.2	98.8
... .. 8 oz.	157.7	21	180	16.7	1038.7	103.6

The effect is more clearly seen by comparing the sum of the food and drink with the amount of urine during these two periods respectively. We have in the ratio 165·2 : 156·4, as compared with 178·7 : 180, grounds for inferring that the use of bread increases the thirst, and the ratio of the amount of urine to the amount of fluids drunk. But these inferences will be more strikingly shown in another case.

A note about this time speaks of the comfortable state of her feelings, but of the rapid disorganization of her lungs, as tested by auscultation. Continuing on the same diet, she returned for a while to the use of dilute nitric acid, with seven grains of opium daily, of which the results are here subjoined for future reference.

Date.	Food.		Urine.			Pulse.
	Fluid.	Solid.	Fluid.	Solid	Sp. gravity.	
Jan. 11	160	21	200	18·6	1040	106
12	160	21	200	18	39	96
13	160	21	180	15·5	37	108
14	160	21	180	15·5	37	116
15	160	21	140	11·7	36	104
16	160	21	180	15	36	100
Mean,	160	21	180	15·7	1037·6	105

But passing over these few days for the present unnoticed, we resume the table at the time when she commenced the use of hydrosulphate of ammonia in doses of five and subsequently of ten minims of the solution thrice a-day, continuing to take six grains of opium and an ounce of brandy daily.

Date.	Food.		Urine.			Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Sp. gravity.	
Jan. 17	164·5	21	140	14	1043	104
18	164·5	21	120	11	40	108
19	164·5	21	140	12·7	39	100
20	164·5	21	140	13	40	96
21	164·5	21	160	15	40	108
22	164·5	21	240	20·6	37	112
23	164·5	21	200	17	37	112
24	164·5	21	140	13	40	104
25	164·5	21	120	11	40	112
27	164·5	21	140	14	44	108
28	164·5	21	200	21	46	116
29	164·5	21	140	15	45	112
Mean,	164·5	21	152·5	14·7	1040·9	107·6

There is obviously a diminution in the quantity of urine passed, as compared with the whole of the previous series of observa-

tions, and more strikingly as compared with the effects of the increased allowance of bread, which had for a while interrupted the steady diminution in this respect that is to be traced in the successive averages after the first, which effects the remedy now under investigation may be supposed to have in some measure counteracted. The same result is also to be noticed in the preceding case, but for fear of the fallacies noticed on that occasion, we forbear to urge it on the present.

The case now drew rapidly to a close ; the feelings of comfort which the poor patient expressed seemed to result more from her failing powers of sensation, than from any relief which was given to her symptoms. She had exhausting diarrhœa, which rendered it impossible to keep an accurate account as heretofore, and she died on February 26.

The abdomen was examined 48 hours after death, when the stomach was found filled with thick mucus, the lining membrane apparently healthy. The intestines were quite healthy throughout. The liver was congested ; the spleen large, pale, and very soft. The kidneys were large, but to the eye healthy in colour, texture, and structure.

There seems here a fair occasion for making a few remarks on the use of creasote, which has been employed in the four cases already detailed. There is much danger in putting forward numerical calculations apart from all the considerations which are so essential to their use in discussing medical questions ; but having already given these at length in the details of the various cases, it appeared useful to repeat the summaries relating to creasote here, separated from the other tables relating to the use of other remedial agents, in order that the real value of this medicine might be tested.

For this purpose the same points of comparison have been used as in the narration of the cases, namely, the result of any previous plan which was exchanged for the use of creasote, or the effects of the medicine during an early period, as in Cases I. and II. Fearing to be led away by my own persuasion of the inefficacy of creasote, I have taken the mean of two observations in Case I, and altogether excluded from the calculation Case V., where the intermission of the opium is apparently the cause of the notable difference. In the table annexed the points of comparison are marked "*a*," the results of the use of creasote "*b*."

Effects of Creasote.

		Food.		Urine.			Pulse.
		Fluid.	Solid.	Fluid.	Solid.	Sp. gravity.	
I.	a.	119.5	36	101.1	8.9	1036	99.1
	a.	142	36	126.3	10.2	1035.2	100.5
	b.	118	36	106	9	1036.9	103.7
II.	a.	115.7	41.7	195.7	14.5	1032.4	×
	b.	98.6	46	170.7	10.4	1833.5	×
III.	a.	109.7	18.2	123.7	11.5	1040.2	81.1
	b.	97.3	29	128.6	12.2	1040.9	89.4
IV.	a.	161.7	33.2	222.2	16.9	1033.3	99.1
	b.	154.7	18.3	170	14.8	1038.8	100.7
Which gives a mean for the two series respectively as follows,							
	a.	129.7	33.0	153.8	12.4	1035.2	94.9
	b.	117.1	32.3	143.8	11.6	1037.5	97.9

Here in two lines is an expression of the value of creasote in diabetes, made as favourable as is allowable within the limits of truth. It diminishes the amount of food and drink, and also of the urine in a slight degree, for a time, perhaps, considerably; but specific powers over the disease it has absolutely none, as tested in four cases, and, in one of those cases, during a period of some months.

But, on the other hand, it is not fair to omit to mention, that in the summer of 1840 a patient under this plan of treatment speedily lost all the symptoms of diabetes, and left the hospital apparently well. Having no notes of the case I cannot say whether the urine actually regained its healthy condition; but as the man died suddenly a few weeks after, (a not unusual mode of termination of diabetes,) the probability is that the disease was not cured.

There are not facts enough before us by which to estimate the real value of hydrosulphate of ammonia in diabetes; we refer to Cases III. and IV. for notices of two observations, and of the fallacies which prevent any conclusion being drawn from them.

In the next case the remedial value of opium was chiefly investigated.

Diabetes treated by Opium. Death in the fourth year of the disease.

CASE V.—Benjamin Napper, 30. June 16, 1841, St Bartholomew's Hospital, under Dr Burrows. Small stature, delicate, fair complexion; tongue moist, with a whitish fur; bowels regular; pulse 84, soft; skin natural; has thirst and diuresis, with pain in the loins, back, and legs; languor and progressive emaciation of five months.

History.—Married, temperate, of a gouty, but not otherwise unhealthy family; a copperplate engraver. He has always enjoyed good health till five months ago, when he first noticed that he was passing a large quantity of urine, there being at that time nothing unusual in his habits or circumstances to explain it. At the same time his trousers became stiff, and covered with a white crust wherever any of his urine fell upon them. He had an inordinate appetite, but eating was followed by a pain in the epigastrium. The progressive emaciation alarmed him so as to induce him to apply for relief here.

He generally passes his urine three or four times in the night; he is not aware that the weather makes any difference in the quantity passed. He has noticed a strong smell in his urine; at present it smells very like extract of taraxacum.

Auscultation detects no evidence of pulmonary disease.

He was put upon diet consisting of animal food, with from six to eight ounces of bread; but of the daily amount of this no exact record has been kept. For the first two days he took five grains of carbonate of ammonia thrice a-day. The amount of the urine for these two days is set down in the tables as a standard by which the subsequent progress of the case may be measured, not admitting of any inferences in itself.

	Fluid.	Solid.	Sp. gravity.
June 17,	320	29.8	1040
18,	280	26.0	40

His urine appeared at this time to contain at least 32 grains of sugar to the fluid ounce.

He was now put on the use of one grain of opium every night, which he continued to July 5, with the following results.

Date.	Fluid.	Solid.	Sp. Gravity.	Date.	Fluid.	Solid.	Sp. gravity.
June 19	240	24.0	1043	June 30	200	20.0	1043
20	200	19.5	42	July 1	190	19.9	45
22	220	21.0	41	2	190	19.9	45
23	240	22.9	41	3	180	18.0	43
24	180	18.0	43	4	280	27.4	42
25	200	18.1	39	5	190	19.9	45
26	200	18.6	40				
28	200	20.0	43	Mean,	207.3	20.5	1042.6
29	200	20.5	44				

It would be too hasty an inference to attribute these effects to the opium when so many causes were combined, namely, an animal diet, a regulated temperature, and rest. We pass on, therefore, to the next period, during which he took two grains of opium at night, with one grain of disulphate of quinine thrice a-day. The profuse perspirations, diarrhœa, and tenesmus, gave the reasons

for interfering with a plan of treatment that seemed to be answering so well.

Date.	Fluids.	Solids.	Sp. gravity.	Date.	Fluids.	Solids.	Sp. gravity.
July 6	200	20.5	1044	July 18	180	16.7	1040
7	200	19.5	42	19	170	15.8	40
8	200	19.1	41	20	250	24.8	40
9	200	19.5	42	21	160	14.9	40
10	200	18.1	39	22	190	18.1	41
11	200	19.1	41	23	190	19.0	43
12	200	19.5	42	24	200	18.6	40
13	240	22.9	41	25	160	15.2	41
14	200	18.6	40	26	160	16.0	43
15	260	23.6	39	27	180	18.8	45
16	200	18.6	40				
17	220	20.9	39	Mean,	198.1	19	1041

During this period it is noted that the perspirations have become less profuse, and he has noticed a return of his usual feelings. Diarrhœa seems to ensue whenever the weather is at all cold. There is an appearance on his gums like that resulting from the action of mercury.

The conclusion to which the last average would at first sight lead is, that the disease had now become stationary, and, as so small an improvement had taken place under the use of increased quantities of opium, it is perhaps* allowable to infer that the former diminution had resulted more from the change of diet than the use of that particular medicine; we shall see that, under the influence of larger doses of opium, a very considerable improvement took place in the symptoms during the next period. His diet remains during this much the same as before, but his medicine consists of opium two grains thrice daily, without the quinine.

Date.	Fluid.	Solid.	Sp. gravity.	Date.	Fluid.	Solid.	Sp. gravity.
July 28	180	17.1	1041	Aug. 8	150	15.7	1045
29	160	16.7	45	9	100	10.4	45
31	150	15.0	43	11	150	14.6	42
Aug. 1	160	14.5	39	12	150	14.6	42
2	140	14.6	45	13	180	16.7	40
3	140	14.0	43	14	140	14.3	44
4	160	14.9	40	15	180	17.6	42
5	160	15.2	41	16	170	16.2	40
6	160	15.6	42				
7	140	14.6	45	Mean,	153.8	15.1	1042.4

* The author would not be understood to make such a statement generally; a slight observation of the treatment of the complications of fever will supply most abundant evidence to the contrary.

We are slow to admit the efficacy of any form of treatment in this disease, but the conclusion is irresistible from the last average, as to the power of opium in suspending the progress of diabetes, while the high specific gravity shows that it had here exerted no influence in the cure of the disease. The notes taken from time to time speak of the comfort that he felt in himself; they allude occasionally to a severe diarrhœa, his pulse varying from 92 to 112; his tongue still, as all along, covered with a white pasty fur, quite unlike the tongue that is usually seen in cases of diabetes. Now that his attention has been called to it, he says that he has noticed his hair to be unusually brittle. He has not, however, observed anything about his teeth and gums beyond what has been already described.

The opium was now suspended, that he might try the effects of creasote; but the experiment was not continued more than a week, of which the results are here subjoined.

	Fluid.	Solid.	Specific gravity.
August 18,	220	21.0	1041
20,	190	18.5	42
21,	240	22.9	41
22,	220	20.5	40
23,	200	19.5	42
24,	200	18.1	39
Mean,	211.6	20	1040.8

The quantity of creasote taken was only four minims daily. The difference in the result of the last as compared with the previous average probably arises from the intermission of the opium.

From after this time there is no accurate daily note of the amount of his urine available for our present purpose. He left the hospital towards the end of November, the average of the last two weeks of his stay in the house giving

Fluid.	Solid.	Specific gravity.
180	15.2	1036.5

the lowest attained, however, being between September 23d and October 17th, when the average gives

Fluid.	Solid.	Specific gravity.
152	12.3	1035

but I am neither sure of the perfect accuracy of this result, nor exactly what medicine he was taking, though there is little reason to doubt that he returned to the opium plan of treatment.

When he left the hospital, he seemed well in health and was getting fat; his tongue remained furred.

The next note is in June 1842. He was then passing a large quantity of urine of specific gravity 1042, which gave on evaporation a saccharine extract. He felt habitually cold and languid, continued to sweat much at times, and had occasional diarrhœa.

He ate anything that he fancied, and felt no ill effects from so doing, and he kept at his work.

In the summer of 1843 he continued passing urine of high specific gravity, which gave a large quantity of sugar on evaporation. He continued to sweat at times. In appearance he was the same as when he left the hospital in 1841, and he suffered very little from his complaint.

In the spring of 1844 he was passing urine of a high specific gravity to the amount of four quarts daily. He had fallen away much, and felt so ill that he took from some one in his neighbourhood a medicine which at once reduced the daily amount of his urine from four quarts to half a pint. Within a week he had cough, great dyspnœa, with occasional hæmoptysis, heat, thirst, and most intense pain in the epigastrium, with acid eructations. Thus he continued for nearly a fortnight, when he became insensible, and lay comatose for two days before his death, which happened on May 2d.

The body was not examined.

Diabetes treated by Animal Food, Opium, Iron. Effects of Weather on the Disease.

CASE VI.—James Arnold, 34. November 1, 1843. Addenbrooke's Hospital, Cambridge, under Dr Bond.—Tall, slightly made, face distressed; skin harsh, hair thin and rough; tongue clean, moist, red; gums natural; pulse 102, small and soft; bowels confined; has nausea, languor, thirst, and diuresis of four months.

History.—Healthy, married, a labourer at Shelford; has never known any relations to suffer from the same complaint. Has always been spare, weighing no more than $11\frac{1}{2}$ stone, though tall. He has lived mostly on vegetable food, disliking fruit, preferring meat to other things, especially the fat part. He dates the complaint from harvest time, during which he was ailing, but unable to say precisely in what way he suffered; indeed he does not seem to have paid any particular attention to his complaint. Since his illness he has been deaf in a slight degree; he has little sleep at night, always feels hot, and has sometimes pain in his stomach. He is also liable to pain down the inside of the thighs; this most frequently at such times as his urine stops suddenly during its discharge; but he has no other symptoms of the presence of a calculus in his bladder.

The thorax is well formed, and nothing but a transient rhonchus is audible on auscultation.

No exact account of the quantity of urine passed daily before or during the few first days after his admission has been preserved, but the decrease in the quantity is so great in the subsequent

progress of the case, that the loss of this standard of comparison is hardly felt, and the results of the first system of treatment adopted may be conveniently taken instead.

The first plan prescribed the use of 30 grains of carbonate of ammonia with 20 of Dover's powder daily. His drink was of variable quantities of tea and water, his solid food of meat sixteen ounces, and bread twenty-eight ounces.

The effects of this plan of treatment have been recorded during 14 days, during which time the only remarks that have been made, notice two spontaneous perspirations, on the 17th and 19th respectively, preceded by a chilly feel, and confined to the upper part of the body.

Date.	Food.		Urine.				Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Sp. grav.	No.	
November 8,	123	44	180	19.7	1047	×	102
... 9,	193	44	210	22.9	47	15	120
... 10,	183	44	190	20.8	47	14	90
... 12,	163	44	180	19.7	47	15	×
... 13,	163	44	180	18.0	43	×	100
... 15,	163	44	175	17.9	44	13	×
... 16,	163	44	180	19.7	47	13	96
... 17,	163	44	180	20.5	49	14	88
... 18,	183	44	200	20.0	43	14	100
... 19,	173	44	190	19.4	44	14	84
... 20,	173	44	190	19.9	45	14	92
... 21,	163	44	185	18.5	43	12	96
... 22,	163	44	180	10.8	45	12	100
... 23,	163	44	195	20.4	45	13	120
Giving a mean,...	168	44	186.7	19.8	1045.1	13.5	9

It seems that the pulse was lower on the two days that he perspired than on any other days, but there is no other notable difference. It would seem, too, that he was slightly improving under this plan of treatment, but the change is so slight that it is hardly worth an analysis to show what the eye detects in the general results of the three last days.

He now came under the care of Dr Bond, to whose kindness I am indebted for the permission to publish this case, as well as for much assistance in obtaining correct information on all the details, which, with the help of my late friend, Mr Carey, were registered daily. The only difference in the medical treatment of the case was the omission of the carbonate of ammonia, which was left off on November 28th, the Dover's powder being distributed in smaller doses over a larger part of the day, and gradually increased to thirty grains daily. As this treatment was pursued till February 15th, the uniform nature of the case allows the investigation of a

few important particulars, which henceforward begin to be noticed, namely, the influence of the atmospheric changes, but just at the present period, most strikingly, the influence of diet upon the phenomena of his disease here recorded. Within four days the twenty-eight ounces of bread were knocked off from his allowance, and this article does not appear again in his dietary till March 10. The period during which the chief changes were made is presented below separate from the rest. The notes made during this time speak chiefly of pain in the stomach and occasional profuse perspiration. His weight remained about 140 pounds during the week next following.

Date.	Food.		Urine.				Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Spec. gravity.	No.	
Nov. 24	163	30	195	20.9	1046	14	120
25	163	23	185	21.9	51	13	96
26	143	23	175	18.7	46	12	96
27	140	43	170	18.6	47	12	104
28	130	48	160	17.5	47	11	114
29	120	48	155	15.5	43	11	100
30	110	48	150	14.6	42	11	108
Mean,	138.4	37.5	170	18.2	1046	12	105

showing already a striking diminution.

The bread taken from his allowance had been replaced by meat, with the addition of greens. During the next short period the daily allowance of meat was from thirty-two to forty ounces, with sixteen ounces of greens. But at present, while the changes from the alteration of his diet are so rapid, we forbear the examination of any further particulars, whose influence would be quite lost sight of among so many greater changes.

Date.	Food.		Urine.				Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Spec. gravity.	No.	
Dec. 1	110	48	145	15.1	1045	10	96
2	100	56	140	15.0	46	10	108
3	90	56	135	14.4	46	10	108
4	90	56	130	13.6	45	9	×
5	90	56	125	10.4	36	9	104
6	80	56	120	10.3	37	9	96
7	80	56	120	11.1	40	8	104
8	80	56	115	10.9	40	8	120
9	80	32	115	10.9	40	8	120
10	80	32	110	8.2	32	8	90
Mean,	88	50.4	125.5	11.9	1040.7	8.9	105.1

a result confirmatory of the inferences from the previous analysis.

And this result is more striking if the amount of daily fluid and solid nourishment be more accurately calculated out. Taking from the original tables what seems to the eye a fair average of the exact amount of these particulars, we have in the three periods already analysed, on comparison of the ingesta with the urine,

	Food.		Urine.
	Fluid.	Solid.	
First period,	184.00	22.67	186.7
Second do.	168.72	11.78	170.0
Third do.	124.72	16.28	125.0

a clearer view of the rapid improvement of this patient, though, as will be evident from summing the averages already given, this rough average does not give the whole amount of the improvement.*

We would stop here to claim this improvement, in great measure, as the good effect of the change of diet. There had been but little change in the medical treatment, except leaving off the ammonia, and few, we apprehend, would be inclined to attribute to this circumstance the following rapid improvement, though we must confess at the same time that we have no means of absolutely proving that such was not the case, and can only refer to general experience, and on the present occasion to Case V. of this series, to show that ammonia is not hurtful in diabetes, so that its omission should be followed by such strikingly good results. Then as for the opium:—This medicine, it is true, was continued all along, but its effects, so long as the vegetable diet was persisted in, are not nearly so marked as after the change of diet; so without underrating the effects of this medicine, which are so abundantly seen in other cases, we have no hesitation in setting down most of the improvement to his change of diet.

From this time to February 15, the quantity and quality of the food taken is uniform, with one or two exceptions, the solid food consisting of meat, 32 ounces; greens, 16 ounces; and the fluid of broth, 40 ounces; tea, 40 ounces; and porter, 10 ounces daily,—giving a daily sum of 123.52 ounces of fluid, and 14.48 ounces of solid matter. His medicine was opium three grains daily.

Before examining the influence of the weather on his disease, it will be of interest to look into the effects of a rigid animal diet continued for so long a period as sixty-six days. For this purpose the average of the first and last ten days respectively may be compared. This gives, on examination of the urine,

* The sum of the chance averages of the exact amount of fluid and solid ingesta, as compared with the exact mean of the amounts set down in the tables, is 206.67 : 212 for the first; 180.50 : 175.9 for the second; and 141 : 138.4 for the third periods respectively.

	Fluid.	Solid.	Sp. grav.	No.	Pulse.
For the first period,...	105.5	10.	1040.8	8.4	93.7
For the second,.....	95.9	10.1	1045.5	6.2	85.0

From which, it would seem, that the disease itself was nearly stationary; that its essential characteristic of the loss of a certain quantity of particular solid matters by the urine was not henceforth to undergo much change, though the symptoms accompanying that characteristic might be alleviated by treatment.

Farther, it appears that the inferences from the following analyses may be safely adopted, and this, even were the elements of the calculation drawn from particular parts, instead of being pretty evenly distributed over the whole space.

For brevity's sake, the state of the weather, which we now proceed to investigate, in relation to its effects on his disease, is expressed by letters *f.* and *r.*, denoting, as it was fine or rained, the degree of humidity, and *c.* and *w.*, as it was cold or warm, the temperature. As these particulars were not observed with any definite view to their being submitted to the public, it has frequently happened that only the general characteristics of a day have been set down, as that it was windy or lowering, and thus some days are excluded from our notice at present. The patient was in a large airy ward, and the state of the day has been registered according to one's own feelings in that ward, without the use of exact instruments.

Date.	Food.		Urine.				Pulse.	Weath.
	Fluid.	Solid.	Fluid.	Solid.	Sp. gravity.	No.		
Dec. 11	90	48	110	8.9	1035	9	96	r. c.
12	105	10.0	41	8	96	f. c.
13	105	10.0	41	8	80	f. c.
14	110	9.2	36	9	x	f. c.
15	105	10.0	41	8	110	r. w.
16	105	12.2	50	9	92	r. w.
17	110	10.5	41	9	x	f. w.
18	102	8.5	36	8	90	f. c.
19	103	11.2	47	9	92	r.
20	100	x	x	7	x	r. c.
21	100	9.5	41	8	x	r. c.
22	105	10.0	41	8	x	r. c.
23	101	9.8	42	7	80	f. c.
24	100	10.4	45	7	84	f. w.
25	102	9.5	40	x	100	r. w.
26	98	8.4	37	x	x	r.
27	95	7.7	35	7	80	r. w.
28	95	8.8	40	7	x	f. w.
29	90	9.2	44	7	84	r. w.
30	91	9.3	44	7	85	f. c.
31	88	8.1	40	6	x	f. c.

Date.	Food.		Urine.				Pulse.	Weath.
	Fluid.	Solid.	Fluid.	Solid.	Sp. gravity.	No.		
Jan. 1	90	48	90	8.5	1041	6	90	r. c.
2	95	5.7	26	7	80	f. c.
3	97	10.1	45	7	x	r. w.
4	95	9.9	45	6	76	r. w.
5	90	9.6	46	6	80	f. w.
6	96	10.2	46	6	100	f. w.
7	92	9.4	44	6	80	f. w.
8	95	9.9	45	7	x	f. c.
9	100	10.4	45	7	80	r. c.
10	95	10.1	46	6	80	r. c.
11	95	9.9	45	7	100	f. c.
12	94	x	x	6	80	r. c.
13	100	10.4	45	7	85	r. c.
14	94	9.1	42	6	96	f. c.
15	95	9.9	45	6	90	f. c.
16	100	x	x	7	95	c.
17	60	...	100	10.0	43	7	x	c.
18	90	...	100	10.4	45	7	100	w.
19	95	11.2	51	6	100	r. w.
20	95	10.1	46	6	80	f. c.
21	95	10.3	47	6	85	f.
22	97	11.2	50	6	85	f. w.
23	100	10.4	45	7	x	f. w.
24	95	9.9	45	6	80	f. c.
25	100	10.4	45	7	84	f. c.
26	95	8.8	40	6	90	f. w.
27	100	10.4	45	6	95	w.
28	95	8.8	40	6	100	f. c.
29	100	10.4	45	7	90	r.
30	100	10.0	43	7	95	f.
31	95	8.8	40	6	90	r. c.
Feb. 1	95	9.9	45	6	95	f. c.
2	100	10.4	45	7	95	r. c.
3	95	9.9	45	6	90	r. c.
4	100	10.4	45	7	80	r. c.
6	95	10.8	49	6	x	f. c.
7	100	9.7	42	7	x	r. c.
8	95	x	43	6	80	c.
9	95	10.8	49	6	x	f. c.
10	95	9.2	42	6	x	r. c.
12	95	10.8	49	6	x	c.
13	95	11.0	50	6	90	c.
14	94	8.9	41	6	x	c.

The most satisfactory way of instituting the above investigation appeared to be by taking those days on which both particulars of the degree of temperature and humidity have been observed, the register being generally complete on those days, and the same data being thus available for both calculations, which would otherwise be liable to a source of error in addition to what they may already involve from inaccuracy of observation.

For this purpose, the fourteen days marked r. c., and the eight marked r. w., with the eighteen and nine marked f. c. and f. w.

respectively, have been put through their various combinations to produce the following averages:—

	Fluid.	Solid.	Sp. grav.	No.	Pulse.
r, (c. w.)	98·3	10·3	1045·2	6·9	88·7
f, (c. w.)	89·6	9·6	1043·0	6·5	87·3
c, (r. f.)	98·1	9·9	1043·7	6·9	87·1
w, (r. f.)	85·5	9·9	1044·2	6·4	89·3
r. c.,	99·2	10·5	1046·0	7·5	86·6
r. w.,	98·0	9·9	1043·8	6·1	91·7
f. c.,	87·2	9·4	1042·7	6·5	87·6
f. w.,	74·4	9·9	1044·6	6·6	86·5

The results, perhaps, are not different from what might have been expected, but still they are worth examination. We find that damp and cold, combined or separately, have the effect of increasing the quantity of urine; that damp has a tendency to increase the amount of solids, and fine weather just the reverse; indeed in this respect fine weather seems to produce more beneficial results when accompanied by cold, but this may be either accidental, from the small numbers which a subdivision of the basis of the present analysis affords, or the more probable solution is, that he was allowed to walk in the garden on fine warm days, but kept in the ward, and consequently warmer, on the cold days. There are, however, no notes expressly stating such to have been the case. The specific gravity appears to have been raised by damp and cold, but the same fallacy appears here as was noticed in the last particular. Frequency of micturition was influenced much by cold, and most decidedly when accompanied by damp; but, lest too favourable a conclusion of the good effects of warm weather on this disease should be inferred from the above summary, it is to be observed, that on the warm damp days the pulse was notably more frequent than at other times.

As the patient seemed to be making no progress, the only very sensible improvement being the fact of his having gained ten pounds in weight during the last two months, he was now ordered to take six grains of iodide of iron daily, still continuing the use of animal food as before. This period extends to March 10th. The particulars noticed in it have reference to the effects of the treatment adopted on his urine. The account of the weather is not available for any conclusions as in the last period, partly because of the entries not being so full, and partly because of alterations observable in his diet. These alterations consisted chiefly in the occasional omission of his daily allowance of greens. Perhaps from the case getting somewhat tedious, the tables no longer record the number of his pulse day by day.

Date.	Food.		Urine.			
	Fluid.	Solid.	Fluid.	Solid.	Sp. gravity.	No.
February 15	90	48	95	10.1	1046	6
16	...	48	96	10.2	46	6
17	...	48	95	9.5	43	6
18	...	48	96	7.8	35	6
19	...	48	94	9.1	42	6
20	...	48	95	9.5	43	6
21	...	32	94	9.4	43	6
22	...	32	97	9.7	43	6
23	...	32	94	9.4	43	6
24	...	48	100	9.7	42	7
25	...	48	92	8.9	42	6
26	...	48	97	9.6	42	6
27	...	48	94	8.7	40	6
28	...	48	95	8.6	39	6
29	...	32	93	8.6	40	6
March 1	...	32	95	9.0	41	6
2	...	48	96	8.9	40	7
3	...	48	94	9.6	44	6
4	...	48	94	8.3	38	6
5	...	32	95	9.2	42	7
6	...	48	90	8.5	41	6
7	...	48	90	8.5	41	6
8	...	32	90	8.3	40	6
9	...	48	90	8.5	41	6
10	...	40	91	8.2	39	6

The last view given of the state of this patient was at the end of the opium treatment. It is worth while to repeat that observation in comparison with the observation, after the lapse of a month, of his condition under the use of iodide of iron. We have, for the period when he took

	Urine.				Pulse.
	Fluid.	Solid.	Sp. gravity.	No.	
Opium,	95.9	10.1	1045.5	6.2	85.0
Iodide of iron,	92.5	8.7	1040.7

At this distance of time, in the absence of any note stating the contrary, it is my belief that the opium was continued while he was taking the iodide of iron. The results, therefore, cannot be considered as speaking very favourably of the use of this last medicine, especially when it is added that fine though cold weather predominated during the latter period.

Taking the same medicine daily, the same quantity of so-called fluid food and of greens as before, but the amount of meat being reduced to 24 ounces daily, he was now allowed two ounces of bread each day till March 19th.

Date.	Food.		Urine.			
	Fluid.	Solid.	Fluid.	Solid.	Sp. gravity.	No.
March 11	90	42	95	8.8	1040	6
12	...	42	95	9.2	42	7
13	...	42	92	8.1	38	6
14	...	42	95	10.3	47	7
15	...	26	90	9.6	46	6
16	...	42	90	9.3	45	6
17	...	42	88	9.2	45	6
18	...	42	90	8.7	42	6
Giving a mean of	90	40	91.8	9.1	1043.1	6.2

The quantity of bread was now increased to four ounces daily, all other circumstances remaining the same till March 26th.

Date.	Food.		Urine.			No.
	Fluid.	Solid.	Fluid.	Solid.	Sp. grav.	
Mar. 19	90	44	88	7.9	1040	6
20	...	44	90	8.3	40	6
21	...	44	95	7.9	36	7
22	...	44	95	8.8	40	6
23	...	44	95	7.5	34	7
24	...	44	90	8.7	42	6
25	...	44	91	8.4	40	6
Giving a mean of	90	44	92	8.2	1038.8	6.2

And again, till his discharge on April 3, he was allowed eight ounces of bread daily.

Date.	Food.		Urine.			No.
	Fluid.	Solid.	Fluid.	Solid.	Sp. grav.	
March 26	90	48	88	8.6	1042	6
27	...	48	94	9.4	43	7
28	...	48	87	7.2	36	6
29	...	48	90	9.1	44	6
30	...	48	86	8.0	40	6
31	...	48	92	9.4	44	6
April 1	...	48	88	7.9	40	6
2	...	48	90	9.3	45	6
Giving a mean of	90	48	89.3	8.6	1041.7	6.1

It will be most convenient to examine these three analyses in connection with each other, by bringing the results together—taking the previous result as a standard of comparison—

	Food.		Urine.			No.
	Fluid.	Solid.	Fluid.	Solid.	Sp. grav.	
No bread,	90	42	92.5	8.7	1040.7	6.2
Two ounces,	90	40	91.8	9.1	1043.1	6.2
Four ounces,	90	44	92.0	8.2	1038.8	6.2
Eight ounces,	90	48	89.3	8.6	1041.7	6.1

If any inference may be drawn from this comparison, it is that the immediate effects of giving a small quantity of bread are not very marked, and that these effects diminish in course of time by the system becoming habituated to its use. But it must be added, that, at the same time, the weather was becoming much warmer than before, and was latterly particularly fine.

He was now discharged with the external appearances of good health, and feeling better, he says, than he has done for two years, his weight having increased from 140 to 161 pounds, the last 3 pounds under the use of the iodide of iron. It is of interest to examine his condition, when he returned a few weeks after, to estimate the effects of the want of constant care and attention upon him.

	Food.		Urine.				Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Sp. grav.	No.	
May 12,	70	24	240	25.1	1045	9	100
13,	50	40	263	22.6	37	11	100
14,	70	40	240	21.8	39	10	80
15,	70	40	250	26.2	45	11	60
16,	70	40	220	24.2	43	9	50
17,	70	40	200	19.1	41	9	50
18,	70	40	130	13.6	45	7	x
Mean, ...	67.1	37.7	220.4	21.8	1042.1	9.4	73.3

Of the further effects of the treatment I have nothing to say, for he now passed from under my observation. I would only call attention to the last table, short as it is, showing how great a progress was made in a few days, to its general summary as compared with the previous summary on his discharge as illustrating the rapid retrogression since his diet and comforts had been less scrupulously attended to, and add my recollections of the haggard state in which he reappeared whom we had seen looking so well a few weeks before. The diet under which he was making such rapid progress was 16 ounces of meat, 8 ounces of bread, 16 ounces of greens, with 20 ounces of broth, 10 ounces of porter, and 40 ounces of tea.

At the end of three years, (July 1846,) he is still alive, having passed through the last mild winter favourably. He passes but little urine, which, however, is highly impregnated with sugar.

He takes opium, and expresses great comfort from its use. But symptoms of pulmonary disease have shown themselves, under which he appears to be sinking.

Diabetes treated by Sulphur, Opium. Relation of the state of the bowels to the disease.

CASE VII.—Jeremiah Bottom, 31. April 15, 1844. Addenbrooke's Hospital, Cambridge, under Dr Bond.—Small stature, fair complexion, with red hair: skin dry and harsh; tongue moist, red, and smooth; pulse small and soft; bowels relaxed; complains of weakness, lassitude and great thirst, with pain in the epigastrium increased by pressure, cramps in his legs, progressive emaciation and diarrhoea of three months.

History.—Healthy, living in a fen on a ground floor. None of his relations have ever suffered from a similar disease. Six months since caught cold, followed by pain in the loins, which compelled him to give up work 19 weeks ago, and for which he was admitted into the hospital a few weeks back. While under treatment as a case of rheumatism he complained of pain in the epigastrium, and the relief that he obtained from the application of a few leeches attracted considerable attention. His constant diuresis was also noticed, and on examination this day his urine was found distinctly sweet, and of high specific gravity.

He was now put on a regular system of diet and medicine, of which the results are subjoined. The weather is recorded as so uniformly fine and warm that no inferences can be drawn as to its effects upon his disease, as in the last case. Nor does medicine seem to have had much effect upon him after the few first days, for he at once dropped down to the average, about which he remained during the rest of the time that he continued under observation. This, however, appears worth examining, and at the same time it will be of interest to look into another particular which the circumstances of the case incidentally supply, namely, the relation of the more or less relaxed state of the bowels to the symptoms of his disorder here tabulated.

During the first period, which extends to April 21, when he was put on the use of sulphur, no mention is made of any particular medicine that he was taking. His diet during this period was composed of meat 16 ounces, greens 16 ounces, bread after April 15, 8 ounces, with broth 40 ounces, tea 40 ounces, and porter 10 ounces. A small dose of castor oil on April 17, first set up the diarrhoea, his bowels having been confined during the few previous days.

As no satisfactory conclusions could be drawn from the mean of seven terms, when the two first differ so widely from the rest as they do in the following table, the first average has been

drawn from the five last days only, allowing the two first to stand as evidence of the power of treatment by diet or other means to control the symptoms of diabetes up to a certain point, the rest of the observations displaying in an equally forcible manner how difficult it is to pass that point.

Date.	Food.		Urine.				Bowels open.
	Fluid.	Solid.	Fluid.	Solid.	Sp. gravity.	No.	
Ap. 15	50	32	190	16.3	1037	×	×
16	90	40	130	13.3	44	×	×
17	90	40	90	8.7	42	6	×
18	90	40	85	8.9	45	5	5
19	90	40	90	8.3	40	6	4
20	90	40	90	8.3	40	5	4
21	90	40	90	7.9	38	5	3
Mean,	90	40	89	8.4	1041	5.4	2.2

This must be taken as a standard of comparison by which to measure the further progress of the case. It is only to be noted here, that he had increased in weight from 120 to 130 pounds during this period. During the next period he increased 2 pounds more, his diet remaining the same, with the exception of his having no greens on April 29, and his medicine being one scruple of sulphur thrice a-day.

Date.	Food.		Urine.				Bowels open.
	Fluid.	Solid.	Solid.	Fluid.	Sp. gravity.	No.	
Ap. 22	90	40	85	7.3	1037	5	3
23	90	40	90	8.3	40	5	2
24	90	40	90	7.6	36	6	2
25	90	40	88	7.3	36	6	2
26	90	40	90	7.6	36	6	3
27	90	40	85	7.9	40	6	4
29	90	24	90	8.3	40	6	2
30	90	40	90	8.5	41	6	4
Mean,	90	38	88.5	7.8	1038.2	5.7	2.7

The gain, as compared with the previous analysis, seems trifling, and so far as the present case allows that conclusion, it would seem that sulphur has no curative agency in diabetes. For the remaining period he was put on the use of two grains of opium daily. The chief difference in his diet was the occasional omission of the greens, and, for about the middle part of the time, of half his allowance of bread. His weight during this time diminished from 132 to 123 pounds.

Date.	Food.		Urine.				Bowels open.
	Fluid.	Solid.	Fluid.	Solid.	Sp. gravity.	No.	
May 1	90	40	93	8.4	39	6	10
2	50	24	80	8.6	45	5	5
3	50	20	80	8.6	45	6	4
4	50	20	80	7.4	40	6	10
5	90	24	90	7.9	38	6	3
7	50	23	86	8.8	44	6	3
8	70	23	84	7.8	40	6	2
9	70	23	90	8.3	40	6	3
10	70	23	85	8.3	42	x	3
11	50	23	83	7.9	41	5	2
12	90	24	85	8.3	42	6	1
13	70	36	90	8.3	40	6	1
14	70	40	90	8.3	40	6	2
15	70	40	90	8.3	40	6	x
16	70	40	85	7.9	40	x	2
17	70	40	90	8.3	40	6	x
18	70	40	90	8.3	40	6	3
Mean,	67.6	29.5	81.2	8.2	1040.5	5.8	3.6

There is a very sensible diminution in the quantity of food taken and of urine passed, but the quantity of solid contents and the other particulars do not materially differ. Indeed it is the stationary character of the case that renders it particularly available for the examination of the subject of the next analysis.

For this purpose nineteen days have been chosen, during nine of which the bowels were relaxed from ten to four times daily, and on the other ten, once or twice only; the two extremes of a scale, of which three is the centre. The mean of these observations is for

	Food.		Urine.				Bowels open.
	Fluid.	Solid.	Fluid.	Solid.	Sp. grav.	No.	
The nine days, ...	76.6	22.6	85.8	8.3	1041.6	5.0	5.5
The ten days, ...	78.0	33.0	87.5	8.0	1039.5	5.7	1.8

The results are not different from what might have been anticipated, namely, that rather more urine is passed when the bowels are confined than when they are relaxed; that urine being also of less specific gravity, the two particulars nearly compensating each other, as tested by the amount of solid contents of each respectively. Yet this result is quite contrary to what has already been seen in Case IV.

The case now passed from my observation, and I have no knowledge of the ultimate result.

The cases above detailed supply a means for estimating the remedial value of opium in diabetes, but as this is a point which

has attracted the attention of many, and as the author has nothing new to urge on the present occasion, it does not seem necessary to analyze the results of this mode of treatment as carefully as has been done in the case of creasote. Passing over Cases III. and IV., where this medicine was used in conjunction with several others, we would point to Case V., where an increase in the amount of the urine immediately followed the omission of this medicine, as an illustration by inversion of its ordinary effects. The next case, VI., supplies an instance of what may be called successful practice in this disease, a person enabled to live in comparative comfort by the most careful attention to his diet and the use of opium. It is not possible to separate the results of the two here, for diabetes is not a disease that it is advisable to experiment upon so long as the patient is going on satisfactorily upon any plan of treatment. Nothing can be more desirable than to lay any thing else on the foundation already laid, but the omission of all that had previously done good is not justifiable on account of the patient, as neither, with due care, is it necessary for the accuracy of the experiment. But it must be recollected that opium is a medicine which it is highly desirable to replace by a substance, which, like creasote, is said to have specific virtue over diabetes. The value of the end justifies the chance of a present sacrifice to the patient, by means of the omission of the opium, which the supposed similar effect of the two medicines requires. The experiment, however, was completely unsuccessful in Case V.; and if we compare Cases I. and VI., where, under a rigid system of diet, creasote and opium respectively were fairly tried for many weeks, the conclusion seems obvious that opium, with all its disadvantages, is infinitely superior to creasote in the treatment of diabetes. However, these are only two cases, and a more extended observation might show many that have stood equally still under the use of opium, as indeed happened in Case VII. after the first few days.*

In the next case the sugar disappeared from the urine some time before death. The sequel of the case does not, however, give us to infer that the disease was cured.

*Diabetes, effects of Regimen. Disappearance of the Sugar.
Death. Dissection.*

CASE VIII.—Mary Ann Sinclair, 35. January 19, 1843. Addenbrooke's Hospital, Cambridge, under Dr Bond. Moderately robust, but less fat than formerly; face anxious, pale; tongue clean, red, rather dry and indented at the edges; papillæ

* With regard to the injurious effects of opium I am free to confess that I have not often witnessed them in cases of diabetes. Cases I. and II., treated by creasote, constantly required purgative medicine; IV., V., and VI., treated by opium, seldom needed it; not to quote other cases not here mentioned.

prominent; skin dry and hot; bowels confined; pulse 84, small, and without power.

History.—A widow, has one child living; has always had good health. Thirteen weeks ago felt weak and listless, and suffered from constant nausea, at the same time she had great thirst, and what little food she ate she had great difficulty in digesting. From a little earlier than thirteen weeks ago, the catamenia have been very profuse, and since the last menstrual period she has had a mucous discharge from the vagina.

Her voice is weak, but this from her general debility rather than from local changes. She has no cough, and no auscultation of any morbid sounds in the lungs is recorded. She has rather forcible abdominal pulsation.

The urine is pale, with a vinous smell, yielding a saccharine extract on evaporation, and by fermentation giving eighteen grains of sugar to the ounce; this exclusive of all the carbonic acid, (by the volume of which the amount of sugar had been calculated,) which was absorbed by the water.

She was ordered to use exclusively animal food, with some of the green vegetables; and under this treatment the amount of urine fell, in the course of the next six days, from 120 or 160 ounces at 1045 or 1046 specific gravity, to the amount at which the accompanying table commences, which table, slight as it is, and displaying nothing but the progress of the case in two or three particulars, it has been thought advisable to insert in this place.

Date.	Urine.			Date.	Urine.		
	Fluid.	Solid.	Sp. gra.		Fluid.	Solid.	Sp. gra.
Jan. 21	50	5.5	1048	Feb. 16	60	6.1	1044
22	45	4.1	40	17	60	6.8	49
23	40	3.2	35	18	60	6.4	46
24	40	3.3	36	19	70	7.4	46
26	40	3.7	40	20	50	5.1	44
27	50	3.7	32	21	60	6.2	45
28	45	3.2	32	22	50	4.7	41
29	45	3.4	33	23	40	2.8	31
Feb. 4	40	2.9	32	24	50	3.4	30
7	50	4.8	42	25	40	2.6	28
8	80	6.4	35	26	40	3.0	33
9	45	3.4	33	27	40	3.0	33
10	50	4.6	40	28	30	2.4	35
13	40	4.0	44	Mar. 1	45	2.6	25
14	50	5.2	45	2	44	2.4	24
15	40	2.7	30	3	45	2.4	23

Compared with some of the preceding cases, the disease will appear to have been but slight in the patient now under examination. Indeed, as the table stands, her symptoms were slight,

but it must be recollected that this was the lowest standard, and that the previous standard had been much higher, though it was in so short a time reduced to the amount prescribed in the table. It is of interest to observe the great fluctuations in the different columns, though a detailed analysis would lead to no results but what have been deduced from the fuller tables.

A few particulars were observed during this time. The quantity of sugar visibly decreased each day in the urine that was evaporated, and the residue of this operation had the smell of common urinary extract, not the treacly odour previously noticed. Some of the urine, after the sugar had been removed by fermentation, and the fluid a little concentrated by evaporation, gave a radiated mass of crystals on the addition of nitric acid, (nitrate of urea.)

She became easier, to her own feelings, and left the hospital, still pursuing a system of animal diet.

April 29. She has had good health since her discharge; her urine is 1042 specific gravity, very acid, of a straw-yellow, turbid, with a yellow powdery sediment, containing not a trace of sugar upon fermentation. Nitric acid formed a crop of crystals in the unconcentrated and unfermented urine. The acid reaction of the urine was not neutralized by carbonate of lime, and nitrate of silver threw down a precipitate possessing all the properties of phosphate of silver.

She continued in the same state during the autumn of that year, abstaining from vegetable food of all sorts; her urine generally natural in quantity, but liable to vary in this respect. She had still an eruption of psoriasis, which had appeared during the previous months.

On January 8, 1844, she said that she had felt unusually well during the last few weeks. On this day her urine was 1040 specific gravity. She had some pains in the epigastrium, for which she was ordered to apply a few leeches to that part. They gave no relief. Next day she was delirious; on the 11th and 12th she was convulsed, and died on January 13th.

I am indebted to Dr Bond for the particulars of the examination of the body.

There was abundance of fat. The internal organs generally were gorged with thick dark fluid blood; lungs small, healthy. Heart fat, flabby, with small dark coagula in its cavities. Stomach small, flaccid, with thin coats; the mucous membrane of a deep red colour, thin and soft in the large curvature, and smeared in part with a dark secretion. There was arborescent injection of all the smaller vessels, and staining in the tracks of the larger ones. Liver healthy externally, within homogeneous on section; gall bladder empty. Kidneys large, flabby, the capsule parting

easily, within congested, especially in the cortical part. Uterus smeared within with blood; small cysts in one ovary, which was also congested. Brain generally congested.

Could the most sanguine observer of diabetes expect more than happened in this case? The daily amounts registered in the table fluctuate a good deal; but the general average had been reduced to within very reasonable bounds, yet she died, and apparently of diabetes, pure, uncomplicated by phthisis. It may be asked, what is the use of recording all these particulars, since they apparently do not embrace the particular on which diabetes turns? It is only in the hope of arriving at what we do not know, by what we do know, that these cases are put forwards. We have seen the effects of steady long-continued treatment in different forms on some of the symptoms, for indeed they are nothing more than symptoms,—spontaneous attempts for the relief of diabetes. We subjoin the effects of a more active remedy, as witnessed in the following case. We defer all general remarks till after the narrative of that case.

Diabetes treated by Iodide of Potassium.

CASE IX.—John Hinckley, aged 39. October 10, 1843. St Bartholomew's Hospital, under Dr Hue. Tall spare figure; skin harsh and dry; tongue clean and glazed; pulse 84, small, soft; bowels confined. Has thirst, pain in the throat, languor, and diuresis of six months.

History.—A butler, married, habitually intemperate, of a phthisical family, but has always had good health and been free from cough. Six months ago he caught cold, and on recovery from this found that he had constant thirst. He was not alarmed at the quantity of urine he made, as he drank so much, till he noticed a white stain on his clothes wherever his urine fell; and then, his symptoms increasing, he applied here for relief.

He has noticed his hair come out, but this he ascribed to his frequent bathing and washing to relieve the thirst. His throat is red, but not swelled; his gums are swelled and very irritable. He has always been slow to perspire, but notably so during his present illness.

Owing to a mistake in keeping the daily register, only a small part of this is available for the present purpose, sufficient to test the effects of treatment, but not to watch the progress of it day by day. He was allowed 32, and, after the two first days, 36 ounces of animal food, with from 10 to 6 ounces of bread. Of fluid he was allowed, milk, 10 ounces; broth, 40 ounces; tea, 40 ounces; and water, what he called 5 ounces. His medicine was iodide of potassium, gradually raised from half a drachm to one ounce in the course of the day.

Date.	Food.		Urine.				Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Sp. grav.	No.	
October 12.....	90	40	130	12.1	1040	×	84
13.....	95	38	140	12.3	38	10	66
14.....	95	46	135	12.2	39	9	72
15.....	100	46	130	13.0	43	9	84
16.....	90	36	110	11.2	44	8	84
17.....	55	43	110	11.2	44	8	90
18.....	75	43	150	13.2	38	9	72
19.....	85	43	115	10.4	39	×	90
30.....	62	43	100	9.0	39	8	120
31.....	42	43	100	8.8	38	9	120
November 1.....	42	42	110	9.9	39	9	×
2.....	42	43	105	8.0	33	9	100

Comparing the mean of the first eight with that of the last four days, we have for the

	Food.		Urine.				Pulse.
	Fluid.	Solid.	Fluid.	Solid.	Sp. grav.	No.	
First period,	85.6	41.8	127.5	11.9	1040.6	8.8	80.2
Second period,	47.0	47.7	103.7	8.9	1038.2	8.7	113.3

The difference in the amount of fluid food taken daily is very considerable, and, in other respects, there is a sensible improvement; but the increased frequency of the pulse would incline one to think that these results are, as it might be, compulsory; that the disease was modified by the presence of another action, induced, perhaps, by the medicine, and that iodide of potassium, even in such large doses, though it may check some of the symptoms, is quite powerless towards effecting a cure of diabetes.

These large doses of iodide of potassium did not usually produce any sensible effect, but I believe they were generally taken on a full stomach. After one of the two drachm doses he had intense pain at the stomach, and felt for an hour or so as if he was going to die. This was the only prominently marked symptom, and occurred only once; after this the medicine was discontinued. He never had coryza, such as is commonly seen as the result of small doses of iodide of potassium; indeed I have never seen the use of large doses followed by this symptom. Yet, though it would seem that large doses have an equal, if not a greater, effect on chronic rheumatism and periostitis than small doses, with less chance of any annoyance from coryza or catarrh, yet the possible appearance of such symptoms as this patient presented would make one hesitate to exchange the risk of an annoyance for the more distant risk of danger to life.

He left the hospital shortly after this note. He was seen again in January of the next year, differing in no respect from what he was when under treatment, as far as could be ascertained from his own account.

Possibly it has occurred to some on the perusal of these cases, that though many subjects have been passed over, yet in the questions that have been examined the effects have not always been attributed to the right causes. For instance, Case VI. is the only one where the influence of the weather and external temperature has been investigated, but on how many of the six in whom hardly any mention is made of this particular, may we not suppose the same causes to have been in action? The objection is perfectly just in a general point of view; the chief difficulty in the course of this essay has been to take care that it did not apply to particular instances; and to any general inferences drawn from all the cases, on the relations of the several particulars therein recorded, possibly it might be a fatal objection that the state of the weather was not mentioned;—for single cases continued through no great length of time, we refer to the case wherein the state of the weather has been recorded, to show that the atmospheric changes have no very great effect on the sufferers from this disease. We are not aware of the existence of any other source of fallacy beyond what is mentioned in the individual cases, where, in the facts of the case, the means for its detection are supplied.

There is one point of interest which, as no further conclusion is attempted to be drawn from it, may be conveniently considered at present notwithstanding this denunciation of general inferences. Many observers have been struck by the fact that their patients have passed more fluid in their urine than they have taken as drink. This has already been alluded to in Case II.; but to set the matter in a clearer light, the first and last averages of the different cases, where available, are here repeated. The first column contains the whole amount of food taken during the day; the second is to show that even when the whole amount of food exceeds the daily amount of urine, the fluid drunk usually does not so, and the third column specifies the daily amount of urine. The three averages in Case VI. refer to the two periods of his stay in the hospital. In Case I. only do the two averages refer to very different degrees of external temperature, according to the season of the year.

	Total Food.	Drink.	Urine.		Total Food.	Drink.	Urine.
Case 1. {	155.5	119.5	101.1	Case 6. {	212	168	186.7
	154	118	106		138	90	89
2. {	157.4		195		104.8		220
	144.6		170	7. {	130	90	89
3. {	127.9	109.7	123.7		97.1	67.6	81.2
	97.3		102	9. {	127.4		127.5
4. {	175.8	144.8	166.2		94.7		103.7
	185.5	164.5	152.5				

which gives us to infer, that it is ordinarily the case in diabetes that the amount of urine exceeds that of the fluid drunk.

Another point of interest concerns the various likes and dis-

likes of the sufferers from this disorder; a source of much difficulty in the treatment, and on the present occasion, perhaps, of fallacy in the accompanying tables, which all go on the supposition that the daily amount of food was regulated by the patient's own feelings, of which, therefore, it is to be looked upon in some degree as an index. But though several have been asked after these likes and dislikes, and pertinent answers obtained, it does not appear from the sequel that any particular confidence is to be placed in them, for in spite of the assertions of the poor sufferers, the constant cry was for bread and vegetables.

Beyond the remarks that have already been made as occasion offered, it does not seem that the accompanying cases give any grounds to dwell upon the effects of the different articles of diet; but we cannot forbear reverting to Case VI. as illustrating most forcibly the good effects of abstinence from bread, a point which, because when once ascertained it was so readily conceded, has been subsequently considered not to have been sufficiently examined. Generally, the diet was so uniform while the medicines varied, that no estimate can be made of the effects of the former apart from those of the latter.

Much may be done by common means; and though this essay does not claim to have attained to much, the means are common enough, and require only a little diligence in their application. They are perhaps more useful for testing the effects of remedies in single cases, than for the higher purposes for which we have just now tried to use them. A daily note of the above kind would be a much more useful guide, and much more available than such as render Rollo's work so exceedingly tedious and difficult of reference. Such notes, however, must be more for the practitioner's own present guidance than for any other purpose. They speak of the symptoms that he is treating, not of any cure of the disease of which a distinct cure has yet to be shown. It is not enough that the urine cease to contain sugar, that all the symptoms above registered yield, for any particular mode of treatment to be lauded as a specific. They may all yield and yet the patient die of diabetes.

There is a remark made in respect of the treatment of acute disease by Sydenham, which we may well apply to that of diabetes. "*Semper enim rebar non sufficere ad comprobendam in acutis medendi rationem, ut feliciter ea cederet, (cum ab imperitissimarum muliercularum temeritate sanentur nonnulli,) sed requiri adhuc ut morbus, nullo negotio victus, quasi suapte genio cedat atque abitum affectet, quantum ejus fert natura.*"*

In more homely phrase, something more is required to establish the curative efficacy of a medicine in a disease where so many things do good up to a certain point, than to be able to write at the end of a case, that the specific gravity and quantity of the urine returned to the natural standard, and nothing more has been heard of the patient.

* Sydenham, *Obs. Med.* IV. 4, § 10.