methods of treatment employed were liable to cause injury to the hepatic tissue. This we believe not to be the case, and the evidence upon which this belief is based is given above.

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INSULIN IN ALCOHOLIC SOLUTION BY THE MOUTH.

BY

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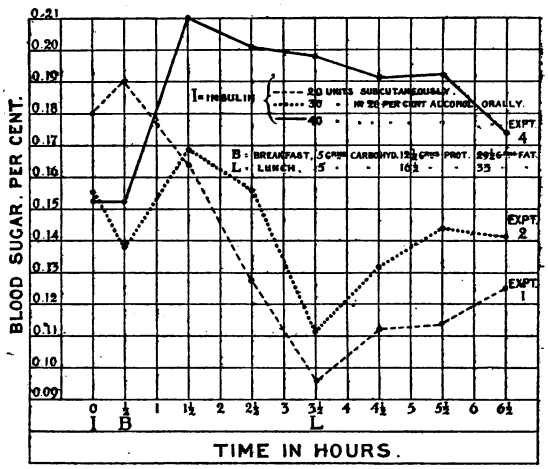
IN view of L. B. Winter's experiments on rabbits,[1] tests were made on a "pedigree" patient to see if it was a practicable therapeutic measure to administer insulin in alcoholic solution by mouth to man. Winter used very large doses of insulin. The present results in no way contradict Winter's findings—in fact, one experiment definitely supports his work; but they suggest that oral administration in alcohol would be so uncertain and so expensive as to be of little or no therapeutic value in diabetes mellitus in man.

The patient selected was a woman of 31 who has been treated with insulin and rigid dieting since April, 1923. Since September 26th her daily food intake has been 20 grams carbohydrate, 60 grams protein, and 120 grams fat, the carbohydrate being restricted to green vegetables. This amounted to 28 calories per kilo of body weight. With this diet she has taken 20 units insulin each morning and 15 units each evening.

The analyses are given in the table, and the single positive finding, one of the three negative experiments, and the control test with subcutaneous insulin in the chart. The same batch of insulin—namely, A.B. 239—was used throughout. For oral administration the insulin was removed from the phial by a sterilized syringe in the ordinary way and mixed with the requisite amount of alcohol and distilled water, the vessel being finally washed out with more of the diluted alcohol, which was also swallowed.

* Working on diabetes with a grant from the Medical Research Council.

Having shown in Experiment 1 that the particular batch of insulin (A.B. 239) was potent when given subcutaneously, and that the dose of 20 units was causing the usual fall in blood sugar for this particular patient, 30 units were given by mouth on an empty stomach in 17½ c.cm. 20 per cent. alcohol (1½ c.cm. insulin solution, *plus* 6 c.cm. 25 per cent. alcohol, *plus* 10 c.cm. 20 per cent. alcohol). The result was decidedly hopeful (Experiment 2). Next day it was shown that 17½ c.cm. of 20 per cent. alcohol alone were without effect (Experiment 3), there being the typical diabetic



rise in blood sugar lasting over three hours even after so small a meal as 5 grams carbohydrate, 12½ grams protein, and 29½ grams fat. Three days later 40 units in 20 c.cm. 20 per cent. alcohol were given by mouth on an empty stomach (Experiment 4) without any apparent effect whatever. It was thought that the alcoholic solution had gone rapidly through the pylorus. In the next experiment, therefore, the 40 units were given after food—five minutes after a starch-free bran biscuit and half an ounce of butter; again with negative result (Experiment 5). Lastly, the effect of increasing the strength of the alcohol was tried (Experiment 6); 40 units in 20 c.cm. 40 per cent. alcohol were given, again without effect on the blood sugar curve (after breakfast). To make sure again that the insulin used was potent, 20 units were given subcutaneously on the same day immediately before lunch, with the usual fall in blood sugar.

From these tests it will be seen that, with one exception (Experiment 2), a dose of insulin by mouth double that required subcutaneously is valueless. Even if it were possible to supply insulin in alcoholic solution at

	Experiment 1. Nov. 7, 1923.	Experiment 2. Nov. 8, 1923.	Experiment 3. Nov. 9, 1923.	Experiment 4. Nov. 12, 1923	Experiment 5. Nov. 16, 1923.	Experiment 6. Nov. 22, 1923.
Fasting blood sugar before insulin ...	0.180	0.155	0.145	0.153	0.212	0.190
Dose of insulin units	20, subcutaneously.	30, orally, taken fasting	Nil. (17½ c.cm. alcohol taken fasting)	40, orally, taken fasting	40, orally, after food	40, orally, in 40 per cent. alcohol, taken fasting
Blood sugar 1/2 hour after insulin ...	0.190	0.138	0.143	0.152	0.220	0.188
Breakfast (1/2 hour after insulin) consisting of 5 grams carbohydrate, 12½ grams protein, and 29½ gram fat ...						
Blood sugar 1½ hours after insulin ...	0.161	0.169	0.177	0.210	0.240	0.203
Blood sugar 2½ hours after insulin ...	0.128	0.156	0.193	0.201	0.223	0.218
Blood sugar 3½ hours after insulin ...	0.096	0.111	0.163	0.198	0.199	0.185
Lunch (3½ hours after insulin) consisting of 5 grams carbohydrate, 16½ grams protein, and 33 grams fat			15 units insulin subcutaneously		15 units insulin subcutaneously	20 units insulin subcutaneously
Blood sugar 4½ hours after insulin ...	0.112	0.132	—	0 191	—	0.193
Blood sugar 5½ hours after insulin ...	0.114	0.144	—	0.192	—	0.156
Blood sugar 6½ hours after insulin ...	0.125	0.141	—	0.174	—	0.102
Glycosuria, after the meals	Nil	Nil	Trace	Trace	Marked	Marked
Ketonuria, after the meals	Slight trace	Trace	Trace	Marked	Trace	Trace

Remarks.—In Experiment 1 there was the usual lowering of blood sugar. Experiment 2 showed definite but not such marked lowering of blood sugar. In Experiment 3 the blood sugar rose in the ordinary way. In Experiment 4 oral insulin had no effect; an evening dose of 20 units insulin was ordered instead of 15 units. In Experiment 5 oral insulin after food had no effect. In Experiment 6 oral insulin in 40 per cent. alcohol had no effect; subcutaneous insulin produced the usual lowering.

half its present price it would still be more expensive to give it orally. But to my mind much more serious than expense is the uncertainty of the oral method of administration. The very fact that a single positive result was obtained shows the possible danger of the method. We have no control over the pyloric sphincter. Also it is conceivable that there might be danger for those with achlorhydria (and it is to be remembered that 4 per cent. of healthy individuals are estimated to have achlorhydria) in that pepsin would not be activated, and in that an oral dose, if calculated from a series of experiments on other patients as being a certain multiple of the subcutaneous dose, might be an overdose for the achlorhydric. Moreover, if the insulin were given with food it is possible that variations in the articles of diet (in spite of keeping the intake of carbohydrate, protein, and fat constant) might influence the proportion of insulin absorbed or destroyed by pepsin.

The experiments are admittedly few in number and confined to one patient. This patient is an expert at diet calculations, however, and has submitted to a large number of blood sugar curves for previous experimental work. She has for several weeks given herself 35 units of insulin daily, and her fasting blood sugar, tested frequently, has remained steady within narrow limits. She, of course, stayed in the laboratory for these special experiments, eating her food off the laboratory bench. The results are recorded in the hope that other workers who have done similar experiments will publish their findings, and so prevent the raising of false hopes in the minds of those suffering from diabetes mellitus.

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A CASE OF MALARIA ARISING IN THIS COUNTRY.

BY

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ALTHOUGH nearly five hundred cases of locally contracted malaria have been discovered in England since 1917, the vast majority of them can be traced to infection from cases returned from abroad. Indeed, it is probable that malaria is no longer endemic anywhere in England save in the isles of Sheppey and Grain on the south bank of the Thames estuary. The chief interest of the following case is that it suggests the possibility of another endemic focus in the Essex marshes on the opposite bank.

K., a girl aged 12, was admitted to the London Hospital on September 10th, 1923, with the following history:

A fortnight previously she had returned to her home in the East End from a Girl Guides Camp at Pitsea, Essex. Ten days later (that is, five days before admission) she had had a "shivering attack" followed by headache and "stiff neck"; the attack was repeated two days later. She felt quite well and said there was nothing wrong with her. Her bowels had been constipated since the onset and she had vomited once after the first attack. She had had no previous illness.

Her father, while at Gaza in September, 1917, was ill for three days with "sandfly fever"; he was cured by pills and did not leave the battery lines. In September, 1918, he had a similar attack in France; again he was cured by opium and quinine pills without going into hospital. He has had no attacks since and has been in perfect health. The mother is healthy and has had no shivering attacks; one other child, aged 9 years, is healthy.

The patient was a pale, intelligent child in no pain or distress. Temperature 105°, pulse 140, respirations 30. The tongue was furred; the heart and lungs were clear; spleen enlarged 2½ finger-breadths below the costal margin, uniform and rather hard.

First Day.—Rigor at 4 p.m.—four stages: (1) coldness of the feet spreading to the body; (2) trembling of shoulders and legs; (3) short sleep; (4) awoke feeling hot and sweating.

Second Day.—Rigor 5.30 p.m.

Third Day.—Rigor 2 p.m.; parasites (benign tertian) found in the blood.

Treatment by quinine was started. There were no more rigors, and the temperature remained normal. On discharge ten days later the spleen was not palpable.

The length of time (five years) since the father's last attack—if, indeed, he ever had malaria—and the absence of the anopheles mosquito from the East End district in which the patient lived eliminate the father as the source of infection. No history can be obtained of any lodger, relative, or neighbour ever having suffered from malaria, and everything points to the child's infection having been acquired while in camp. The children slept there in three barns situated in a lonely spot in the marshes south of Pitsea. The nearest habitation, the farm to which the barns belonged, was about half a mile away and was itself some three miles from Pitsea village. Inquiries revealed no recent cases of malaria and no returned soldiers were living in the neighbourhood. The farmer stated that in his youth "everyone" on the marsh had "ague," and he himself had had two attacks, one as a boy and one as a young man, some thirty years ago. He gave a vivid description of a typical attack of malaria. On examination his blood showed no parasites.

As late as October 30th mosquitos were plentiful in the neighbourhood and three were caught inside the barns where the children slept; they proved to be *Culex pipiens*. Pitsea, however, is given as a locality for *Anopheles maculipennis* by the authorities of the British Museum (Natural History).

I am indebted to Dr. Robert Hutchison for permission to publish this case.

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SPONTANEOUS RUPTURE OF THE LOWER UTERINE SEGMENT.

BY

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SPONTANEOUS rupture of the lower uterine segment must be a very rare occurrence, and perhaps on this account the notes of the following case may be of interest.

I was asked to see a patient, aged 30 years, at 5.45 p.m., on account of abdominal pains which had commenced an hour earlier. She was then in the thirty-sixth or thirty-seventh week of her first pregnancy. The pains had the character of first-stage labour pains. External examination showed the child to be lying in the left occipito-anterior position. No vaginal examination was made as at the routine examination two or three weeks before no abnormality had been discovered. At 6 p.m. the pains became much more severe and I commenced the administration of chloroform through Junker's inhaler. At 6.15 the patient, although under the influence of chloroform, made a violent expulsive effort and the child was born. The infant weighed only 5 lb. and its head was very soft. Immediately following the birth of the child a large haemorrhage occurred. The patient was turned on to her back and the fundus of the uterus grasped; this was found to be well contracted. A hand was then passed into the vagina, and a laceration was found which admitted the whole hand and which extended through the cervix and lower uterine segment into the left broad ligament. The placenta was rapidly removed from the cavity of the uterus and the cervix drawn down to the vulval orifice. Two volsellae were then placed side by side at right angles to the cervical axis so as to take a broad grip of the walls of the tear and the cervix was then allowed to ascend to its normal position. The volsellae thus made a partial torsion of the line of laceration and controlled the bleeding. There was no damage to the vaginal walls or to the perineum. The usual methods to combat the shock were then adopted. Dr. Thomas Wilson saw the patient in consultation at 8.30 p.m., and it was decided to leave the volsellae *in situ* for forty-eight hours, and unless the haemorrhage recurred to carry out no further surgical procedure. The tear healed soundly and the patient made an uninterrupted recovery, but a certain amount of tenderness has persisted low down in the left iliac fossa ever since.

Seven months later the patient found herself pregnant again. No complications arose during the pregnancy, but during the thirty-fifth week it was found that the foetus was lying in the left sacro-anterior position. As spontaneous version did not occur, at the commencement of the thirty-ninth week external version was done under a general anaesthetic. The resulting position was right occipito-anterior. The child was born two days later; it weighed 7½ lb. Except for a slight opening up of the cervical laceration the labour was without complications.

The cause of the extensive laceration at the first labour is obscure. No complications had arisen during the pregnancy, and as the urine had remained free from albumin it would appear that toxaemic causes need not be considered. The tear extended so far upwards that it was impossible to