diet can produce in the system, and bearing in mind that Charcot states that the converse change frequently produces glycosuria as in the instance of novices in the monastery of La Trappe, I do not forget that in the case published by my friend Dr. Rickards, the patient was taking ordinary diet. This relation has not been referred to by other writers, and was obviously absent in many cases reported where the symptoms came on during the course of treatment, or during no treatment at all.

The premonitory symptoms vary very much. Sometimes the attacks begin with maniacal excitement; more commonly abdominal pain or headache are complained of; a sudden fall in the sp. gr. and sugar contents of the urine has been sometimes noticed, and when observed should be regarded with suspicion, although such an alteration is by no means always a cause for alarm.

Prof. Lépine attaches much importance to the rapidity of the pulse as a trustworthy prodromal sign.

The urine gives a Burgundy red colour on the addition of a solution of the perchloride of iron, the colour disappearing on heating the mixture. This reaction was at one time supposed to be a test for acetone, but this is a mistake. It is certainly present in diabetic urine apart from coma, and has been met with in other diseases. Thus Jaksch has met with it in many acute disorders, especially measles, scarlatina, and pneumonia. He has also observed it in a case of gastric cancer terminating fatally by coma. Hoppe-Seyler has described it in a case of sulphuric acid poisoning as occurring during the time no food was taken. Senator observed it in a case of atropine poisoning which died comatose. Dr. Windle has observed it in pneumonia, Bright's disease, scarlatina, and several other pathological conditions apart from coma. It cannot be therefore regarded as in any sense a pathognomonic sign, and we sadly need data to enable us to say whether it is ever absent in cases of diabetic coma. So far as I am aware no one has published a case in which its absence is noted, but I am quite prepared to admit the possibility.

As you are probably aware, diabetic coma was first described by Kussmaul in 1874. In the group of symptoms to which he drew attention, great and well-deserved importance was attributed to the peculiar character of the respiration, which is laboured and hurried, although the respiratory murmur may be plainly audible all over the chest. This symptom is so very striking, that Senator, in a recent paper, has maintained that it must be regarded as characteristic of Kussmaul's type of coma, and that no case of terminal coma in which this peculiar breathing is not present should be included in this class.

Frerichs, too, in his valuable contribution to this question, classifies his cases mainly according to the presence or absence of this symptom. Much as has been said about this dyspnœa, it is not always present in diabetic coma, and such a case was reported in the *British Medical Journal* by Dr. Prescott Roberts.

Senator, while regarding this respiratory dyspnœa as essential to the type of Kussmaul's coma, shows that it is by no means confined to diabetes, and publishes notes of cases occurring in chronic cystitis, gastric cancer, anæmia and atropine poisoning in which it was present.

Dr. W. Roberts gives "slow panting and labourious respiration with drowsiness, rarely coma, and very exceptionally convulsions" as symptoms of obstructive suppression of urine.

Another symptom which is very striking when present, but far from constant, is the peculiar odour of the breath, which has been variously described as like sour beer, apples, hay, chloroform, and acetone. Is it probable that all these comparisons have been applied to the same odour? It would seem that acetone or sour beer affect our noses very differently to apples, chloroform, or hay. Unfortunately, it is very difficult to institute any precise standard of odour. But Drs. Frederick Taylor and Stephen Mackenzie have never been so fortunate as to smell this odour. Frerichs groups several of his cases as not presenting this symptom; it has not been always noticed in the cases we have observed at the General Hospital.

These differences indicate the importance of observing and recording carefully all the facts in such cases when they come under observation. It is probable that there may be two or more types of sudden death in diabetes, and that these may be dependent upon an equal number of distinct morbid influences; but in order to determine this, we want first of all carefully recorded clinical histories. Perhaps I may be per-