with little expense or danger, and some important discoveries might have been made" (*The Dog*, by William Youatt, 1851). Surely the public, at any rate, who place themselves in our hands, under these the worst of circumstances, would unhesitatingly choose to be helped to die painlessly. And in following such a course no practitioner would be violating, by neglect, the great ethical principle of his profession, that he should endeavour as far as lies in his power to preserve life as well as alleviate pain. For there is no single case of reputed cure of developed hydrophobia by drugs or other means that will bear close investigation. Neither has anyone succeeded in arresting by these methods the march of the symptoms when once distinct in an experimental animal, although an enormous series of drugs have been tried, notably by Mr. Dowdeswell (*Proceedings of the Royal Society*). Nor have workers in this direction been able, by the use of drugs, to imitate in the slightest the protection afforded by M. Pasteur's system of inoculation. Of the ability of that system to overtake and check the development of disease, if applied within a reasonable time after inoculation, and under the ordinary circumstances, there is no longer any doubt, but it is powerless against the developed symptoms. There remains for us, therefore, the determination of our action in those cases where M. Pasteur's system has failed, or where it has not been applied. I hope I have shown sufficient reason that that action should, in the present state of knowledge, be simply palliative (by the employment of the most powerful narcotic drugs), and that all tentative treatment by drugs or the hot-air bath, being quite powerless to cure, and, consequently, cruel, should be abandoned.

A NOTE ON METHYLENE AND OTHER ANÆSTHETICS.

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EARLY in May I received from Berlin a sample of "methylene-chloride," manufactured by Riedel, of that city, with a paper on some of the different specimens of that anæsthetic by five other chemists, from a recent number of the *Pharmaceutische Zeitung*. I was informed that Professor Bardeleben had tried, and had been quite satisfied with, Riedel's methylene. Inhaling a little myself, it appeared to me very much like the methylene most used here, but rather stronger; so I asked Dr. Day to make some comparisons of it with that to which we have been accustomed for many years past. And having to operate at Manchester on May 13th, and at Liverpool on the 14th, I took some with me. At Manchester I had to do splenectomy; and Dr. Scott, who had administered ether in Edinburgh for Dr. Keith for two years, preferred ether to anything he had not used before. So he gave ether, with most satisfactory result. I never saw more quiet or complete anæsthesia, and I am glad to say that the patient has done well; but for two or three hours after the operation she had a flushed face, hot forehead, and excessively rapid pulse. I could scarcely count it, but it was certainly over 150. I supposed that this might be due to the altered circulation following removal of the large spleen; but Dr. Scott said that Dr. Keith had remarked to him upon the occasional occurrence of very rapid pulse after his operations. As I could not remember such rapidity after methylene, I was somewhat confirmed in my dislike to ether. I have seen it used alone, or after nitrous oxide, and I have never been quite pleased with the effects. Once Dr. Matthews Duncan and I simply examined a lady after the use of gas and ether, and for twenty-four hours afterwards she was in a state of hysterical, almost maniacal, excitement, which would have been alarming after any severe surgical operation; and more than once I have had to deal with troublesome bronchial irritation after the use of ether. At Liverpool, on May 14th, I performed ovariectomy assisted by Dr. Grimsdale and his son, and Dr. Rawdon (who had been accustomed to the use of methylene) used the sample of Riedel's preparation which I had with me. At first the action seemed rather quicker than usual, but towards the end of the operation, although it was unusually short, it was difficult to send the vapour through the tube of Junker's apparatus, and Dr. Rawdon noticed that the rapid evaporation had led to the partial closing of the tube by a sort of snow, or frozen vapour. This I had never noticed with the London methylene. The patient went

on remarkably well after the operation, so on May 16th Dr. Day used the new methylene for a lady in London for whom I performed ovariectomy. This was also a very short operation, but the patient's face was flushed and her head hot for several hours afterwards, though neither pulse nor temperature was much raised. On the 22nd I did a laparotomy at Gloucester with Mr. Edis, and Mr. Cuthbert preferred to administer chloroform, as being more accustomed to it. It answered admirably, and the patient, like the others, went on quite well. This I have often observed when chloroform has been given for me. The reasons I gave up the use of chloroform as a rule were not only the reports of the deaths to which it had led, but my own observation. I have only once seen a death from chloroform; that was in Paris, when Dr. Waters of Chester and I stood beside Malgaigne while he amputated at the shoulder-joint. But I nearly lost a patient in the Samaritan Hospital while I was removing a breast, Dr. Snow Beck giving chloroform; and twice in private practice, while Mr. Clover was giving chloroform vapour from his bag, I have had to suspend the operation for a time, and resort to artificial respiration during ovariectomy.

It was these cases which led me, at first with the help of Dr. Richardson, and afterwards of Dr. Junker (who devised the admirably simple inhaler which is called after him) to use methylene as a rule, and other anæsthetics only exceptionally. Once in Pomerania, when about to remove an enormous ovarian tumour, none of my German colleagues would give anything but chloroform, to which they were accustomed. The patient was very weak, and I very much preferred methylene; so I showed an intelligent nurse how to administer it, and she did it quite effectually and safely. I mention this to show that any supposed difficulty in the administration of methylene by Junker's apparatus is a mistake. Since 1872 I have preferred methylene to any other anæsthetic.

In the Address on Surgery at Manchester in 1877, I said: "Given properly diluted with air, the vapour of chloromethyl has, in my experience of more than ten years with more than 1,000 operations of a nature unusually severe as tests of an anæsthetic, proved without a single exception applicable to every patient, perfectly certain to produce complete anæsthesia, relieving the surgeon from all alarm or even anxiety; and its use has never been followed by any dangerous symptom which could be fairly attributed to it." And I went on to say: "I wish I could speak as confidently of the chemical composition of the fluid sold as bichloride of methylene as I can of its anæsthetic properties; but whatever may be its chemical composition, whether it is or is not chloroform mixed with some spirit or ether, or whether it really is bichloride of methylene, I am still content with the effects of the liquid sold under that name, when properly administered." And more than ten years' additional experience has confirmed me in the opinions so expressed. Professor Tyndall told me that no chemist could make pure bichloride of methylene under ten shillings an ounce, and that when made it would not keep a week. Others said a mixture of chloroform and methylic alcohol would act as well, but on trial it did not; neither did the A.C.E. mixture of the Committee of the Royal Medical and Chirurgical Society; neither does this new preparation of Riedel's. Last week Dr. Day gave it for me in a case of amputation of a breast. The tube became so choked with snow before I began the operation that the patient could not be made unconscious, and we had to give chloroform, neither of us very willingly, as we had just heard of a patient having become so near death under chloroform that the surgeon had to do tracheotomy with a pocket-knife before animation could be restored.

Surprised at the obstruction of the tube by the new preparation, I wrote to Professor Bardeleben, and he replied on May 29th as follows: "We have made the same observation on artificial snow, and the obstruction of the tubes in using Riedel's methylene-chloride with Junker's apparatus. No doubt it is dependent on the cold produced by the rapid evaporation. We have another objection to make to this new anæsthetic substance. The anæsthesia is effected very slowly, and is not of long duration; and the nausea and vomiting begin often before complete anæsthesia has been attained."

Accordingly, until some better anæsthetic is brought forward, I shall remain content with the bichloride of methylene, made as first proposed by Dr. Richardson. I have never known it to fail, and I have never once been alarmed, or even made uneasy, by its effects in any one of more than 2,000 operations, many of them of unusual severity or duration.