

REMARKS ON THE FATAL CASE OF INHALATION OF CHLOROFORM;

INCLUDING ADDITIONAL EXPLANATIONS
FROM DR. MEGGISON.

By JOHN SNOW, M.D.

AN instance having occurred in which the application of chloroform has ended fatally, it is highly desirable to arrive at a correct knowledge of the cause of this unfortunate result, as well that a repetition of it may if possible be avoided, as for the satisfaction of scientific inquiry. And since the opinion I have formed differs from that of the medical gentlemen who gave their evidence at the adjourned inquest, I have thought it necessary to state my views of the case.

Sir John Fife attributes the fatal effect of the chloroform to peculiarity in the constitution of the young woman, which could not previously have been foreseen. This would necessarily invest the inhalation with some degree of danger, however small, and would entail some anxiety on both the operator and the patient. My view of the matter holds out more hope for the future. I look on the result as only what was to be apprehended from the over-rapid action of chloroform when administered on a handkerchief, as recommended by the greatest authority respecting it—Dr. Simpson, the author of its use, and consider that danger may be avoided by adopting another method. I have observed that the effects of the vapour may accumulate for about twenty seconds after the inhalation is discontinued;* and this accumulation will be the more formidable in proportion to the quantity of vapour that is being inhaled at the moment, and the velocity with which the symptoms are being induced. The entire effects of the vapour, when carried to a fatal issue, might be divided into five pretty equal portions, according to the degrees of narcotism I suggested. Now, in the case under consideration, when the girl had inhaled

for about half a minute, there was rigidity of the arm; this would indicate that she was in the third degree; and supposing that the cloth was removed at that very instant, if the chloroform was not previously expended, and if the vapour was inhaled of the same strength during the thirty seconds, its effects might increase at the same pace for twenty seconds longer; and at the end of fifty seconds from the commencement she would be in the fifth degree of narcotism, in which "the respiratory movements are more or less paralysed, and become difficult, feeble, or irregular."

I wrote to Dr. Meggison for additional information to that given in the report of the inquest on one or two points. He has obligingly answered my inquiries, and also given me leave to make use of his reply. The following is part of his note:—

"With respect to your queries,—1st, As to the nature of the breathing after the inhalation was stopped? 2d, How long did the patient breathe after the removal of the cloth? 3d, As to the moan spoken of. The 1st I can reply to satisfactorily. The breathing was at first somewhat quicker and stronger; then, immediately preceding the moan spoken of, it became very rapid, and ended in what the witness Rayne called a moan, which was a prolonged forced expiration, or rather splutter,—breath, saliva, and tongue, being forced out at once, as it were. The sound was similar to the expiration in epilepsy or hysteria. The remaining expirations and inspirations were exceedingly feeble and few; but I could not speak confidently on the subject, being very much agitated at the time. 2d, The breathing after the removal of the cloth continued upwards of half a minute, but how much I cannot say, having put my watch in my pocket on seeing her move. 3d, The moan, as I have said before, did not appear to me such, but a splutter."

The above explanations make it still more evident that the effect of the chloroform greatly increased after the inhalation was discontinued.

The quantity employed—about a fluid drachm—was, in my opinion, sufficient to account for the result, even supposing that one-half evaporated into the apartment and only the other half was inhaled; for, in using an inhaler by which little or no vapour

* See MED. GAZ., Jan. 14. Two days after I made the statement respecting the cumulative property of vapours in the Westminster Medical Society, viz. Jan. 10, M. Sédillot remarked, in the Academy of Sciences, that with chloroform the pallor, smallness of pulse, weakness of respiration, and coldness of the skin, sometimes increase after the inhaler has been removed, in an alarming manner.

escapes except to enter the lungs, I find that a fluid drachm is sufficient to induce narcotism to the fourth degree in a stout man, when the exhibition of it occupies two or three minutes, and about half as much in a young person of the probable size of this patient; but when the vapour is inhaled rapidly, a given quantity produces a greater effect; and Dr. Simpson remarks, that he has "seen a strong person rendered completely insensible by six or seven inspirations of thirty drops of the liquid."

Whenever I have had the opportunity, for the last two months, I have cautioned the profession against the too rapid action of chloroform when given on a handkerchief or sponge. In objection to what I am saying, the numerous cases in which it has been safely administered in this way may be pleaded, notwithstanding one fatal case. I may mention, however, that I have been privately informed of three or four cases in which the medical man was greatly alarmed for the life of his patient. One case also of this kind occurred in Guy's Hospital, and was related by Dr. Gull in the *MEDICAL GAZETTE*, in the latter part of last year; and I believe that many patients have owed their safety to the rapid loss of the chloroform by evaporation.

If it were correct that some individuals require to inhale several drachms before becoming insensible, there would be reason to believe that others would be unusually sensitive to its effects; but with chloroform, as with ether, I have met with no such exceptions, and I have not heard of any when the vapour has been so administered that it was inhaled without loss. Under these circumstances, the quantity consumed in producing insensibility always appears proportionate to the size and probable weight of the patient, if the inhalation is not interrupted; and the time required to induce insensibility proportionate to the strength of the vapour and the activity of the respiration.

Although many of the inhalers in use are very faulty, I consider that they are safer than the handkerchief. They are liable to the objection that they obstruct the respiration, by causing the air to pass through sponges; but with a limited supply of air the chloroform is necessarily limited also, as its vapour, having no existence in a separate state at common temperatures, can only be

inhaled with the air. To give chloroform in surgical operations, an instrument should be used which offers no obstruction to respiration, and by which the proportion of vapour in the air can be regulated; and those who have but a handkerchief or sponge had better use ether, which I consider has not yet been known to cause death, until other narcotic vapours may be introduced.

In the case under consideration, the fatal result should be attributed to the action of the chloroform on the nervous centres having extended so far as to put a stop to respiration; and I cannot agree in the opinion of Sir John Fife, that the immediate cause of death was congestion of the lungs, an affection which could only have caused death in a somewhat tedious and not in a sudden manner, and which ought undoubtedly to be looked on merely as a consequence of the mode of dying, and as an indication that the heart continued to inject blood into the lungs after oxygen was no longer admitted to facilitate its passage through the capillaries. In certain instances this is the case in animals killed by chloroform, whilst in other instances, which I shall endeavour to explain in a future communication, the respiration and circulation seem to cease together.

Unless when the patient coughs or holds his breath, there is no tendency to congestion of the lungs during the inhalation of chloroform judiciously administered; for the free respiration and undiminished volume of the pulse, shew that the blood passes freely through these organs. Dr. Glover, I am aware, detected obstruction to the pulmonary circulation during life, by the hæmadynamometer placed in one of the arteries of an animal under chloroform; but in that instance the chloroform had been injected into the veins; and any substance that will not dissolve in the blood causes mechanical obstruction to its passage through the lungs: atmospheric air, the presence of which in the lungs is necessary to their circulation, when injected into the veins arrests it.

I would observe in conclusion, that I attribute blame to no one; for Dr. Simpson cannot be blamed if, in conferring on us the benefit of chloroform, his instructions did not issue, like Minerva from the head of Jupiter, perfect and incapable of improvement.

Frith Street, Soho, Feb. 1848.