The foregoing cases comprise all the instances I have seen recorded in which death appears to have been occasioned by the administration of chloroform, and not by other causes in operation about the same time. A few additional cases have indeed been referred to by different authors where death was probably caused by chloroform, but as I do not find that the details have been published, I cannot make them available in an inquiry respecting the cause and prevention of these accidents.

In June 1852, Dr. Simpson alluded in the following terms to an accident from chloroform which had occurred near Glasgow: — "In this instance, chloroform was given by the practitioner for tooth extraction; but, I am sorry to add, none of the parties present were at the time in a condition to give any satisfactory evidence."

A person, named Breton, a dealer in porcelain, died in Paris, in the early part of 1853, immediately after a few inspirations of chloroform, which was administered with the intention of removing a tumour of the cheek. An action was brought against Dr. Triquet and M. Masson for causing death by imprudence in this case; and at the trial which ensued, various interesting opinions were given, and the accused practitioners were ultimately exonerated.* I have not, however, met with any record of the symptoms which occurred in the case.

In relating the case of death from chloroform, which occurred in his practice, to the Medical and Chirurgical Society of Edinburgh, Dr. Roberts referred to another death from chloroform in tooth-drawing which took place in the neighbourhood from which his own patient came, just previously to October 1855; but I have not met with any account of the case alluded to. Dr. Mackenzie of Kelso also alluded in the same Society, in the following year, to a death from chloroform which had occurred at Coldstream, and I do not know whether this was the case to which Dr. Roberts had alluded, or a fresh one.

One of the surgeons at the hospital at St. Louis, who was lately visiting the medical institutions of London, informed me that there had been three deaths from chloroform at his hospital out of between six and seven hundred operations in which

*Gaz. Médicale, 1853, p. 304.
it had been administered. I did not learn the particulars of those fatal cases.

There have been several cases in which persons have been found dead after inhaling chloroform when no one else was present, either for toothache or some other affection, but I have not included such cases in the above list, as they throw no light on the way in which death is occasioned. The simple way to avoid such accidents as those just alluded to, is for persons to abstain from inhaling chloroform, when no one is by to watch its effects.

**ALLEGED FATAL CASES OF INHALATION OF CHLOROFORM**

Several deaths have been attributed to chloroform which were due to other causes, or where the cause of death is a subject of great doubt. A gentleman, named Walter Badger, twenty-two years of age, the son of one of the coroners for the county of York, died instantly at Mr. Robinson's, the dentist's, in Gower Street, on June 30th, 1848, whilst commencing to inhale chloroform with the intention of having some teeth extracted. The inhaler employed consisted of a face-piece to enclose the mouth and nostrils, and containing a sponge on which the chloroform (5 iss) was placed. This, according to the evidence of Mr. Robinson and his female servant, who was present in the room, was held not nearer than an inch and a half from the face for less than a minute, and the patient made the remark that the chloroform was not strong enough; Mr. Robinson requested him, as he had done before, to have the operation performed without chloroform, but he again declined; and Mr. Robinson then took away the face-piece and asked his servant to reach the bottle intending to put more chloroform on the sponge, to replace that which he believed had been lost by evaporation. Just after removing the face-piece, and before any fresh chloroform was poured out, the head and hand of the patient dropped, and he did not show any further sign of life.

I found, on making trial of the kind of inhaler which Mr. Robinson employed, that it is impossible to inhale enough of the vapour to produce any appreciable effect, unless it is applied so as to touch the face. At the distance of an inch no effect is produced, even in five or ten minutes; and therefore I expressed my opinion, soon after this accident, that it was not caused by the chloroform, which properly speaking the patient did not inhale.

A consideration of the symptoms in this case confirms the view that the death was not caused by chloroform. In six of the fatal cases related above, death took place instantaneously, without insensibility or any of the usual effects of chloroform having been produced; but the mode of dying was not the same as in Mr Robinson's patient. In Case 4, that of Madlle. Stock, the patient said "I choke", and tried to push away the handkerchief; then there was embarrassed breathing and foaming at the mouth. In Case 11, that of Madame Labrune, the fatal attack followed immediately on a full inspiration of chloroform, and there was an immediate alteration of the features, and a convulsive rolling of the eyes, amongst other symptoms. In Case 14, the young lady stretched herself out, and frothed at the mouth, at the moment of the fatal attack,
and the face became livid. In Case 26, that of Madame W., who died at Ulm, the voice, when answering the question about singing in her ears, was trembling and thick; she stretched out her limbs, and the face became bluish. In Case 45, that of the wife of a medical man, and in 46, that of Dr. Roberts's patient in Edinburgh, there was a convulsive start at the moment of the sudden death. It thus appears, that when the heart is suddenly paralysed by an overdose of chloroform, before the patient is rendered insensible, there are usually some symptoms as if of a violent shock or injury. After complete insensibility is induced, the heart may be suddenly paralysed by chloroform, as is shown by numerous cases, without this spasmodic action; and it would perhaps be premature to deny that a patient might die thus quietly without being first made insensible; and the nature of the death in this particular case must be chiefly decided by the physical fact that the patient could not have inhaled enough chloroform to produce an appreciable effect of any kind, much less to cause sudden death.

At the inspection of the body, the liver was found so much enlarged that it weighed eight pounds, and it encroached very much on the chest. The walls of the left ventricle of the heart were found thinner than natural, and the muscular tissue was interspersed with fatty degeneration. There was blood in the right auricle and in both ventricles. In the ventricles it was partly coagulated. The brain presented nothing abnormal.*

It is probable that the immediate cause of death in this instance was fear. The patient had been told in the country that it would be unsafe for him to take chloroform, and yet he could not summon resolution to undergo the operation without it. Mr. Robinson unfortunately allowed his patient to remain seated in the operating chair; and it was only when Dr. Waters had been sent for and arrived from a neighbouring street that he was laid on the floor.

I was present on one occasion with Mr. Peter Marshall at the examination of the body of a woman who died suddenly of fright in consequence of a fire in the next house to that in which she lived, and it is worthy of remark that we found exactly the same diseased conditions as those which were found in Mr. Robinson’s patient; viz., great enlargement of the liver, displacing the viscera of the chest, and fatty degeneration of the heart.

A young man, aged twenty-four, died suddenly of syncope, on June 25th, 1848, at the Hospital Beaujon, at Paris, whilst M. Robert was performing amputation at the hip joint, the thigh bone having been broken into splinters by a bullet during the conflict in the streets of Paris. The patient was in a state of great depression, both physical and moral, before the operation; and it is most likely that he sank under the combined effects of the injury and the operation.

Another patient had the neck of the numerous broken by a ball in the same conflict; he was much reduced by haemorrhage and gangrene of the wound; M. Malgaigne performed disarticulation at the shoulder joint; a fresh inhalation took place to enable him to search for the ball, and the patient sank and died during the last incisions. This patient also most

probably died from the effects of the operation added to those of the previous injury and loss of blood.

A woman died in Paris, 1848, after removal of the breast. The operation was finished, and the chloroform had been left off some time, and the patient had become conscious, when on raising her into a sitting posture, in order to apply a bandage, she suddenly expired. Although the chloroform was blamed in this instance, death evidently took place by the ordinary kind of syncope, which arises from the heart not being supplied with blood, and which may be called anaemic syncope, in contradistinction to cardiac syncope, which begins at the heart itself, when properly supplied, or even when distended with blood.

A child, aged twelve years, died in the hospital at Madrid in 1849, during amputation of the leg after violent tetanic rigidity.* Death was attributed to the chloroform which had been inhaled, but no further particulars are given, and it is not stated whether or not there was any unusual haemorrhage, or other cause, which would explain the fatal event.

Dr. Aschendorf has attributed the death of a child a year old to chloroform.† The child had a nævus on the face and neck, which extended from the zygoma to the os hyoides, and from the external auditory meatus to the maxillary fossa. No one had been willing to undertake its removal. Dr. Aschendorf operated on the nævus at three different times, by means of seton threads. These operations were performed under the influence of chloroform. The tumour was reduced one-third part in size by these means, and eleven weeks afterwards Dr. Aschendorf determined to extirpate it. The chloroform was administered as on the former occasions, by placing six drops on some tow in a cup. In about ten minutes, as the child cried a little, three drops more of chloroform were used for inhalation, and in about eight minutes more the operation was concluded. "On raising the child it laid its head on one side, convulsive twitches of the face were observed, with distortion of the eyeballs and dilatation of the pupils. For one moment the arms were stretched out stiff, then again they were relaxed, and fell as supple as the rest of the body. Death quickly followed—only one pulsation of the heart and a single rale with the expiration being perceived.

There can be no doubt of this being a case of death from haemorrhage, after the direct effects of the chloroform had subsided. Dr. Aschendorf says the quantity of blood lost was about two tablespoonfuls; but it would be necessarily removed by sponges during the operation, and there would be no means of estimating the quantity. The child was probably in a state of syncope during the latter part of the operation, as it would not remain insensible to the knife for eight minutes from a single application of chloroform.

* Bouisson, Méthode Anesthésique, p. 398.

(To be continued)