slight enlargement of cardiac area, and a little irregularity of beat existed; no evidence of aortic aneurism detected; general health good.

Treatment.—On the 12th of January (two days after admission) the left leg was firmly flexed, and kept so by bandaging. On the 13th, digital pressure was commenced at 11 A.M., by compressing the right femoral artery in Scarpa's space, and kept up without intermission until 11 P.M., when pulsation was found to have entirely ceased, and the tumour to be much lessened in size. On Jan. 15th, at the visit hour, the swelling was not much larger than a pigeon's egg, being now hard and solid. At 2 P.M. digital compression was applied to the left femoral, and kept up continuously until 11 P.M.—that is to say, for nine hours. At the visit hour next morning (the 16th) pulsation was gone, the tumour solid, and much diminished in size.

No great pain was experienced during the treatment, and the collateral circulation became quickly established. Patient complained of a tingling sensation in the leg during the application of the fingers, but no actual pain was felt, except at the time the hands were changed. Oxide of zinc powder was dusted on the skin over Scarpa's space during the treatment, to prevent abrasion of the skin, and it answered the end effectually. In both legs the posterior tibial artery was felt beating immediately before the compression was started, but on the solidification of the tumour the artery could not with certainty be felt in either foot. The temperature remained alike in both legs, and was at first only slightly below the normal standard. As before stated, pain was complained of only on the gentlemen changing places, but towards night he ceased to notice the change, and was observed to become drowsy.

The order given was to "Stop the pulsation in the aneurism completely, and keep it so," and this order was literally carried out. The gentlemen who kindly volunteered their aid in this case, found that from fifteen to twenty minutes was as long a period as any one of them could effectually compress the artery. Two at least were always at the bedside, and while one pressed the artery, his companion kept his open hand over the sac. In both cases the knee was slightly flexed, and resting on a pillow, and each compressor stood during his turn. From the practice obtained in the right limb, the students found that they were able to manage the vessel with the more ease in the left thigh.

Jan. 23rd, 1877.—Since date of cure both knees have been kept bent, as a precautionary measure, but to-day the bandages were removed. The tumour in the right ham gives the feel of a firm fibrous tumour, about the size of a walnut; that in the left being a little larger and scarcely so dense. The posterior tibial arteries can barely be felt pulsating, yet the temperature is normal and alike in both feet. A small vessel, much enlarged, passes over the outer aspect of each tumour, and one also over the front of the patella.

Feb. 23rd.—Dismissed, and warned not to take long walks in the meantime.

I have tied the femoral artery five times for popliteal aneurism, with one death, in which case, while the patient lay in bed, during the healing process, an aneurism formed in the opposite ham; gangrene of both feet ensued, and the man sank. In another case I effected a cure in three days by flexing the leg firmly on the thigh and keeping it in that position by careful bandaging.

So far as is known to me, this is the only case on record in which two aneurisms in the same individual have been cured in the short period of twenty-one hours.

Glasgow.

SOME REMARKS

ON THE DISCOVERY OF THE ANÆSTHETIC EFFECTS OF CHLOROFORM, AND ITS FIRST EXHIBITION IN ENGLAND.

By M. C. FURNELL, M.D., F.R.C.S.,

SURGEON-MAJOR H.M.'S INDIAN SERVICE, PRINCIPAL OF THE MADRAS MEDICAL COLLEGE, ETC.

I HAVE no desire whatever in the following remarks to attempt to snatch a single laurel from the wreath of fame which encircles the brow of Sir James Simpson. To his other merits, as one of the most able and famous medical men of his time, Sir James Simpson has had added the reputation of having first discovered, and then introduced to the world, the use of chloroform as an anæsthetic. That he first introduced it in Edinburgh, and by his example, and owing to his eminent position, made the use of chloroform quickly and widely popular throughout the civilised world, is a matter which admits of, and happily needs, no denial; but I think I shall be able to show in the following remarks that five or six months before Sir James Simpson used this beneficent agent, it had been first taken, and then brought to the notice of two eminent hospital surgeons of London by the writer of these lines, then a young student just commencing the study of medicine.

The subject has not only been noticed by Dr. Edward S. Dunster in his paper "The History of Anæsthesia," but has lately formed a topic of discussion in one of the leading daily papers of the presidency in which I am serving, and the statements there made by a correspondent signing himself "X. Y. Z." led me to make some inquiries in the matter full of interest to myself, and not without interest, I hope, to the medical profession.

I will first relate, as concisely as I can, my connexion with this discovery of the anæsthetic properties of chloroform, how it lay buried so many years, and how the subject was again resuscitated.

It was in the year 1846 that Dr. Morton, of Boston, made known his grand discovery of anæsthesia by sulphuric ether, one of the most astounding revolutions in medicine. Before this time, to use the words of Velpeau, "a cutting instrument and pain in operative surgery were inseparably connected in the minds of patients, and there seemed no appeal from this apparently necessary association." Men who can remember the operating theatre of a large hospital before Dr. Morton's discovery are gradually passing away; they are every day becoming fewer. I can well remember even now one of the first operations I saw under the old régime. It was on a girl who had in childhood been desperately burnt on the neck and shoulders by falling into a fire. The cicatrix had gradually contracted, so as to draw the unfortunate creature's head down on her breast and her lower lip away from the mouth, exposing the lower row of teeth and allowing the saliva to dribble continually from her mouth. She was a repulsive spectacle, and had gladly consented to Mr. Skey's suggestion of an operation, which, by transplanting a piece of skin from her arm and dissecting up the cicatrix, appeared to afford some chance of mitigating her unfortunate appearance. The patient was tied to the operating-table, as was customary in those days, but before many minutes of the operation had elapsed, her cries and entreaties to be untied and allowed to remain as she was were the most frightful that can be imagined. As the operation, which was necessarily a lengthy and slow one, proceeded, her cries became more terrible; first one and then another student fainted, and ultimately all but a determined few had left the theatre unable to stand the distressing scene. I have since that time assisted, as the French say, at some painful sights. I have seen a strong man flogged for gross insubordination in the field, but his sufferings were light as air compared with the agonies this poor girl must have undergone. These terrible scenes in the operating theatre of a hospital were of weekly, almost daily, occurrence, when Dr. Morton's merciful discovery,

DONATIONS TO MEDICAL CHARITIES.—Major Moriarty, of Plymouth, has given £1000 to University College Hospital, £100 to the Royal Medical Benevolent College, and £100 to St. John's Maternity Home. Joseph Gurney Barclay has given £500 to the building fund of the North-Eastern Hospital for Children, Hackney-road. H. S. C. and the Grocers' Company have each given £100 to the extension fund of the Charing-cross Hospital. The Corporation of London have given 300 guineas to the fund for rebuilding the Metropolitan Free Hospital. The Goldsmiths' and Mercers' Companies have each given £100 to the reparation fund of the Westminster Hospital.

like the wand of a beneficent fairy, swept them for ever from the world. Has the enormous and priceless benefit of his discovery ever been rightly appreciated by mankind? I am afraid not.

It was in the year 1846 that I commenced my studies for a surgeon. I had not been intended for the profession of medicine, so that I discovered, shortly after I began, that not having been pupiled or apprenticed to a practitioner, as was customary in those days, would be a bar to my presenting myself for examination at the College of Surgeons. To overcome this it was necessary to produce a certificate of having attended a course of practical pharmacy, and for this purpose I became a pupil of Mr. Jacob Bell. It was whilst attending his laboratory that the medical world became agitated with the startling discovery of Dr. Morton, and numberless instruments were devised and manufactured for the safe or more effectual administration of sulphuric ether. I, with the inquisitiveness of a youth of seventeen, enthusiastic in his profession, used to amuse myself trying these new instruments and passing my verdict upon them. At last Mr. Bell, alarmed no doubt at the possibility of some accident occurring, gave orders that I was not to be allowed this indiscriminate use of ether, and I found my experiments suddenly cut short. It was on the occurrence of this failure of sulphuric ether that one day, looking about for some to try on a new instrument, I came across a bottle labeled chloric ether. It was a covered and seemingly neglected bottle, away in a dark storeroom. Its contents smelt pleasant, and I, with the audacity of seventeen, put some into the instrument and commenced its inhalation. I soon discovered it was a much more pleasant substance than sulphuric ether. It had a sweetish, agreeable taste, and did not cause that irritative, suffocative cough which made the inhalation of sulphuric ether so unpleasant and to some patients so impossible. It soon also began to produce insensibility.

I drew Mr. Bell's attention to this new discovery, and he recommended me to take it down to St. Bartholomew's Hospital and bring it to the notice of the surgeons there. What followed is best told, perhaps, in Mr. Holmes Coote's own words, as quoted by Sir R. Christison:—"In the summer of 1847 Sir William Lawrence operated on a lady in Essex for scirrhus of the breast, and I accompanied him to assist him and to give the patient sulphuric ether. She coughed so violently, that I had great difficulty in obtaining the necessary anæsthetic effects. Some week or so afterwards I was talking about the inconvenience in the hospital (St. Bartholomew's), when a Mr. Furnell, now in the Bengal army,¹ told me he had a milder anæsthetic, commonly called chloric ether, which he advised me to try. With Sir William Lawrence's assent I used it several times in his private practice, and once upon the very lady who had such trouble with sulphuric ether, and we invariably found that the effect, though slow, was free from other inconveniences." My own recollection of the matter is that I took the bottle down and showed it to Mr. Holmes Coote. He was at that time demonstrator of anatomy, and a great favourite with us all from his kindly, genial manner—just the man a young student would have gone to to communicate such a matter. He asked me if I could guarantee its safety, and my reply was that I had taken it myself, and was none the worse. This was in 1847. My own impression is that it was in the month of May; I am not, however, at this distance of time, quite sure of the month, but it was in the spring time.

In due course of time I passed the College, and went out to India in the medical service of the old Honourable East India Company. The fact that I had used and introduced this chloric ether to the notice of Mr. Holmes Coote and Sir William Lawrence I had in no way forgotten, and often mentioned in conversation with medical friends, but no more notice of the matter seemed to me at all necessary.

In 1869 I came home to England on furlough, and the following strange *rencontre* took place. I one Sunday went down to All Saints, Margaret-street, the famous ritualistic church, to escort home a lady, a relative of mine. There, bound, I subsequently discovered, on a similar errand, I saw Mr. Holmes Coote. I had not seen him certainly for sixteen or seventeen years, but his was a face not easily forgotten. I addressed him, "How do you do, Mr. Coote? you have no

doubt forgotten me, but I remember you very well. I am an old Bartholomew's man." He looked at me for a moment, and then said, "I remember you; your name is Nell—nell something; you are the man who gave me the chloroform many years ago; do you remember?" "Oh! yes, I remember very well, chloric ether; my name is Furnell. "Ah! Furnell, that's it; do you remember? Confound it, what simpletons we were not to have proclaimed our discovery. Why, we had chloroform some months before Sir James Simpson." I laughed at his enthusiasm, and subsequently went home to his house, and had luncheon, and a pleasant chat over old times.

It was whilst I was at home on this furlough that Sir James Simpson died, and I subsequently sent a short note to THE LANCET pointing out the fact of chloroform having been used as an anæsthetic at St. Bartholomew's some months before Sir James's discovery.

I went out to India again, resumed my duties at the expiration of my furlough, and thought no more about chloroform and its discovery until one day in 1874 I received a letter from Dr. Sanderson, a retired, but formerly eminent member of the Madras Medical service, enclosing the following communication from Sir R. Christison:—

"My dear Mr. Sanderson,—I have been trying to meet the tedium of convalescence from a severe influenza by putting together some notes from which I gave, in 1870, a true and particular history of anæsthesia in its several forms. You will see from the enclosed excerpt that a medical officer in your old service is closely connected with the discovery of chloroform anæsthesia, and I think he should be made to put in an appearance, and get what he has a right to. In 1870 I found no Furnell in the Bengal Medical establishment, but in the India List for 1870 I found Michael Cudmore Furnell, Surgeon Madras Army, entered 1855, on furlough. Having no address to direct me, I did not write to him at the time, and afterwards, I fear, forgot the matter till now, when my search after truth has revived.

"There is no doubt whatever that Lawrence, in the summer of 1847, four or five months before Simpson, used, at Furnell's suggestion, chloroform disguised in the impure state, under the misnomer of 'chloric ether.' *There never was, and there is not now, any such substance. The name put Lawrence and Holmes Coote on a wrong scent. Had it been called 'spirit of chloroform,' which it really was, they would have got at its base in a moment. Now I want you to find out Mr. Furnell for me, and to learn from him where he got his information, and whether he had himself used this miscalled chloric ether. Simpson's investigations were in November of the same year, 1847.*

I am, yours most truly,

"R. CHRISTISON."

I have no copy of my answer to Dr. Sanderson, but it must have been in substance much what I have related in the commencement of this paper. Dr. Druitt, the well-known author of the Surgeon's Vade Mecum, was in Madras in 1874, and to him I wrote the letter, in reply to one from him, which appeared subsequently in the *Medical Times and Gazette* of Saturday, May 29th, 1875. The notice of the discovery of chloroform which appeared in that journal, and in which my name is mentioned, owes its existence, no doubt, to his pen.

Thus matters stood until 1876, when I again came on furlough from India. On my leaving Madras, a paper, the *Madras Standard*, was good enough to publish some complimentary remarks on me, and concluded its notice by mentioning that I was the "discoverer" of chloroform. To this a correspondent of the *Madras Times*, signing himself "X. Y. Z.," very properly took exception, pointing out that chloroform was discovered by Soubéiran in 1832; but "X. Y. Z." went a step further, and stated "chloric ether is not chloroform, any more than chloroform is chloric ether." And again, "Chloric ether is chloric ether, and chloroform is perchloride of formyle."

This letter of "X. Y. Z." I first read at my club in London, and it set me thinking if it were possible I had all along been labouring under a mistake about the chloric ether. What was chloric ether exactly? Here was a correspondent, evidently a professional man, stating boldly that chloric ether was not, and apparently had nothing whatever to do with, chloroform. What was chloric ether exactly? Sir R. Christison, it will be seen, says in his letter, "There

¹ This was a mistake of Mr. Holmes Coote; he should have written Madras Army.

never was, and there is not now, any such substance. The name put Lawrence and Holmes Coote on a wrong scent" (vide extract above), and certainly no such substance is mentioned in our Pharmacopœia. I determined to solve this matter for my own satisfaction, and accordingly, almost immediately after reading the letter of "X. Y. Z.," I proceeded to the Pharmaceutical Society's laboratory in Bloomsbury-square, and asked for Professor Redwood, the well-known and eminent chemist. He very kindly explained to me at once exactly what chloric ether was. It was a name synonymous with chloroform, and used also for a spirituous solution of chloroform. (Vide Gray's Supplement to the Pharmacopœia and Beasley's Pocket Formulary.) For instance, we find in Gray's Supplement to the Pharmacopœia, by Theophilus Redwood, Professor of Pharmacy to the Pharmaceutical Society of Great Britain (published by Longmans and Co., London, 1847), "Ether chloricus, chloric ether, chloroform terchloride of carbon. These names have been severally applied to a liquid having an etherial smell, obtained by the distillation of a mixture of weak spirit and chloride of lime" (Dumas.) In Beasley's Pocket Formulary we find it thus written:—"Ether chloricus. The so-called medicinal chloric ether is an alcoholic solution of chloroform of variable strength. Mr. Redwood states that what is sold in this country consists of one part of chloroform to six or eight of alcohol."

This, of course, at once disposed of "X. Y. Z.'s" statement that chloric ether and chloroform had no connexion with each other, by demonstrating that they were one and the same thing.

Sir R. Christison's remark that "there never was, and there is not now, any such substance," is more difficult to understand. "There never was any such substance in the official Pharmacopœia," would be intelligible, and is the fact. There is no chloric ether or chloroform mentioned in any of the Pharmacopœias of that period, 1847. The fact of the matter is that chloric ether or chloroform was very little known at all until Sir James Simpson published an account of its use in 1847, and this, too, is very well shown by Mr. Holmes Coote and Sir Wm. Lawrence's ignorance of what they had got hold of. Even Sir James knew nothing about it until Mr. Waldie, an accomplished pharmacist, drew his attention to it. Before 1847 chloroform or chloric ether was a substance very little known, in fact, almost unknown to medical men; it was scarcely a medicinal, but a chemical substance; since that period few substances have become better known in medicine. Nor was the substance chloric ether—i. e., a solution of chloroform in six or eight of spirits of wine—a Pharmacopœial preparation; if we look up any of the old Pharmacopœias we find no mention of it. It was prepared by some eminent chemists of London, such as Bell and Co., of Oxford-street, and Morson, of Southampton-row, and prescribed occasionally as an anodyne by a few eminent practitioners.

In the present Pharmacopœia (1867) there is a preparation called spirits of chloroform, of 1 in 18 of spirits of wine, and the reason why it is thus diluted is this. The chloric ether of 1 in 6 has a great tendency, when prescribed in an ordinary mixture, to become disintegrated. The alcohol has a greater affinity for water, and leaves the chloroform, which falls to the bottom. Anyone can easily satisfy himself of this. As I am writing I have on the table before me a small bottle into which has been poured one ounce of chloric ether (of 1 in 6) and three ounces of water, and then shaken. The chloroform has become separated from the spirit, and lies at the bottom—a thick, oily-looking fluid, very easily distinguished from the supernatant mixture of spirit and water.

This discovery—for discovery it certainly was to me—that chloroform and chloric ether were names that in 1847 were used for the same substance, very naturally set me thinking whether the bottle I gave Holmes Coote in 1847 was chloroform pure and simple, as described in Gray's Supplement to the Pharmacopœia, or the alcoholic solution described in Beasley's Formulary. A very simple experiment should determine this. I accordingly wrote to my friend and former fellow-student, Mr. Callender, the well-known surgeon of St. Bartholomew's, and asked him to be good enough, as I had in this country no hospital under my charge, to see if chloric ether—i. e., a solution of chloroform 1 in 6 of spirits of wine—would produce anæsthesia. The following is the result of the experiment, as reported by

Mr Joseph Miles, the administrator of chloroform at St. Bartholomew's.

"In compliance with your wish, I have been using the chloric ether—i. e., one part of chloroform and six parts of spirits—for producing anæsthesia during surgical operations. I mixed two fluid ounces of chloroform with ten of alcohol, making a mixture of one part of chloroform to five of alcohol, or one in six; and proceeded to administer it on lint folded twice (four thicknesses) to the following patients.

"Case 1.—A woman, aged twenty-four, for the extraction of a toenail, was ten minutes getting under the influence, and was kept under ten minutes. There was no reflex action; the anæsthesia was complete.

"Case 2.—A man, aged forty-seven, for the opening of an abscess, was fifteen minutes getting under the influence, and was kept under seven minutes. Anæsthesia complete.

"Case 3.—A boy, aged three, for the operation of circumcision, was five minutes getting under the influence, and was kept under ten minutes. Anæsthesia complete.

"Of the twelve ounces there remain four ounces and two drachms."

This very conclusively proves that the dilute chloroform or chloric ether will produce anæsthesia sufficient for all practical purposes, and although it does not prove that the bottle labeled "Chloric ether" first used by Mr. Holmes Coote was not chloroform pure and simple, as I felt after my interview with Professor Redwood at first inclined to think, it shows that there cannot be any doubt that even in its dilute form it can produce anæsthesia, and that Sir R. Christison's statement "that Lawrence in the summer of 1847, four or five months before Simpson used, at Furnell's suggestion, chloroform disguised in the impure state under the misnomer of chloric ether," is fully borne out.

I think Mr. Miles's cases admit of some practical conclusion. Why should not chloroform be always used thus diluted? I think it probable, if it were we should have, few as they are now, fewer accidents. I have always administered chloroform on a handkerchief, in preference to using any machine, from the ease with which in this way we can dilute the anæsthetic with air. It is an expensive but safer way.

In conclusion, I have only again to reiterate I have written the above lines with no desire whatever, far from it, to detract from the just fame of Sir James Simpson. The fact of my having been the first to use and introduce the use of chloroform to the profession was made public (with the single exception of the small note in THE LANCET), not by me but by others, notably by Sir R. Christison; but as the matter has been brought forward, I have felt it would perhaps not be without interest, and it certainly was due to myself and the great school (St. Bartholomew's) of which I was a pupil, to state exactly how it stands. Besides, I must confess it is not without some feeling of pleasure I find my name connected with the discovery of one of the greatest boons ever conferred on suffering humanity.

London.

APPENDIX.

To the Editor of the Medical Times and Gazette.

SIR,—Sir Robert Christison, himself in times past a pupil in St. Bartholomew's, has drawn attention to the first use of chloric ether by Sir Wm. Lawrence and Mr. Coote. In the company of my late colleague, Mr. Coote, and my friend, Mr. Furnell, I have heard the facts you allude to more than once narrated, and they are well known in the school. Perhaps we ought to have published them more widely, but you will find them referred to in the article on Anæsthesia by Mr. Lister, in the System of Surgery, with the exception, which is unfortunately true, of the mention of the intelligence and zeal which prompted Mr. Furnell, whose distinguished Indian career is also well known, to bring chloric ether under the notice of our surgeons, an omission which ought to be remedied in any future edition of the work.

G. W. CALLENDER.

SUNDERLAND has always been well to the front in port sanitary work. The authority has just accepted an offer from the Wear commissioners of a piece of land on which to erect a port hospital for contagious and infectious diseases.