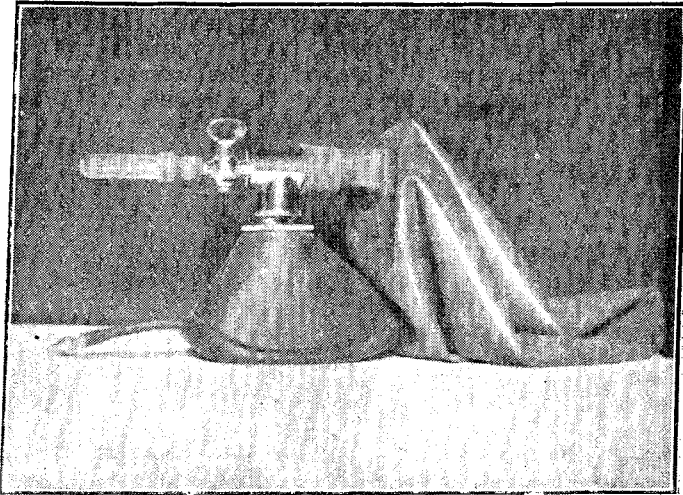


commencement of the inhalation, instead of projecting the ethyl chloride through the tap directly from the bottle, I first measure out a definite quantity into a small tube made of thick glass, which for the sake of accuracy I have marked in three, four, and five cubic centimetre graduations. To this small measure-glass is attached a short piece of red rubber tubing, by means of which it is attached to the end of the tap of the angle-mount (vide illustration).



In the case of a patient sitting up in the dentist's chair the position of the tube in relation to the facepiece is as shown in the illustration and the tap may with advantage be closed. The tube being downwards, no ethyl chloride will escape and no smell will be noticed if the tap is closed. The mask having been accurately adjusted to the patient's face a short period of to-and-fro breathing is first permitted, the tap is then opened, and the angle-mount, with its tube, is rotated from the vertical position—with the administrator's right hand—until it is almost horizontal. The rotation is now conducted gradually so that the fluid will run very slowly out of the glass phial through the tap and metal tube into the bag. If this is done at first slowly the patient will soon get accustomed to the dilute vapour and most of the fluid, at least at first, will evaporate on its way through the tap and metal tube, very little entering the bag in a liquid state. If there is a tendency to holding the breath or to coughing the angle-mount can be rotated back again, thus limiting further evaporation of the ethyl chloride until the symptoms subside; it can then be rotated upwards again and the flow continued until the tube is empty. With a little care and practice there will only on rare occasions be any trouble during induction.

In the case of a patient in the recumbent position it is sometimes better to have the charged tube apart but close at hand. The facepiece having been adjusted the tap is then opened and the tube fixed on, and all that then will be necessary is to tip up the tube very slowly, which is easily done on account of its rubber attachment to the tap. Should more ethyl chloride be required—and this is most likely to occur in the case of full-blooded muscular men and alcoholics—the tube can be removed and recharged with a definite dose, or more may be projected directly from the bottle through the tap. If desired, the bag can be first filled with nitrous oxide and the patient permitted to inhale it until commencing unconsciousness, then the rubber gas tube can be detached and replaced by the charged phial—which should be in this case rather more quickly emptied—and full anæsthesia rapidly follows. By replacing the ether chamber this method can be used to give ethyl chloride as a preliminary to ether just as well as the nitrous oxide-ether sequence, the only thing necessary being the little glass phial with its rubber tube. The idea of the glass tube I have from Dr. F. W. Hewitt who uses it with his special gas apparatus to give nitrous oxide and ethyl chloride mixed. The metal tap and tube of the angle-mount can with advantage be made larger than is generally found and that of mine (supplied to me by Mr J. H. Montague of New Bond-street, London, who also makes the glass tubes) is very much larger.

The following is a summary of the advantages of this inhaler and method of administration: 1. A measured quantity of the anæsthetic fluid is given, varying according to the age of the patient and taking into consideration the

time of anæsthesia required, the nature of the operation, &c. This gives accuracy of dosage and is useful for making observations and notes for future reference. It should also help to insure against an overdose. 2. The ethyl chloride can be given *gradually* and that *after* the facepiece is adjusted; this prevents coughing, holding the breath, &c., and produces a satisfactory induction. The tube need not be emptied if satisfactory anæsthesia is likely to be produced by less than its contents. 3. More can at any time be added if necessary, either by projecting the fluid through the large open tap or by measuring off more in the tube; also, either can be done without having to remove the facepiece which is an advantage in some cases. 4. Movements on the part of the patient before anæsthesia is complete are of little consequence as the charged tube can first be fitted on, which it is desirable to do in the case of children and nervous patients who are likely to struggle or to resist. 5. In the case of struggling it may be better to empty the tube more quickly, and then both hands of the administrator are available to hold the mask and to steady the patient. 6. If the tap is turned off before the tube is fixed on the patient will not experience the slightest smell of the narcotic when the mask is applied. This is of importance in nervous patients. 7. A perfectly free air-way, no lint, sponge, or wool to breathe through, and no freezing vapour near the patient's mouth or nose, as all evaporation takes place in the metal tube and rubber bag. 8. Nitrous oxide can be given as a preliminary, and by retaining the ether chamber ethyl chloride can be given before the ether, all that is necessary being the glass tube. 9. Bromide of ethyl could be given with advantage by this apparatus, as it is important to be able to measure carefully the quantity of the drug. It would be as well to have a larger graduated phial in this case. 10. Economy in the amount of the anæsthetic used.

I have given ethyl chloride by this method and apparatus using the paper bag—as invented by Mr. Rickard W. Lloyd and made by Messrs. Barth and Co.—with satisfactory results and recommend its use instead of the rubber one in the case of patients suffering from tuberculosis. In conclusion, I would state that up to the time of writing I have given ethyl chloride over 150 times by this method and in not a few cases somnoform; also a number of times in conjunction with ether.

Edinburgh.

TWO CASES OF CÆSAREAN SECTION.

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IN the course of last year I had two cases of Cæsarean section for obstruction due to fibroid tumours. These cases did well both as regards mother and child and an account of them was published in THE LANCET.¹ Since then I have had two cases of Cæsarean section for pelvic contraction, which are typical of the two classes in which Cæsarean section is performed for this cause.

The first case is an example of the group in which the fact that the pelvis is contracted and the degree of the deformity have been ascertained some long time before labour is expected, and where a date, generally about a week before full term, has been fixed for the performance of the operation. In such cases every opportunity is afforded for operating in the most favourable circumstances; the patient is thoroughly prepared beforehand as in other cases of abdominal section and the preparations for the operation itself can be made as carefully as in ordinary cases of ovariectomy. The patient has to stand the effects of the operation but she has not been worn out beforehand by prolonged labour nor has she been subjected to the risk of infection by vaginal examinations, with, perhaps, fruitless attempts at artificial delivery through the natural passages. Provided the operator is accustomed to abdominal work and familiar with the special points that require attention in this particular operation, especially as regards the proper method of suturing the uterine wound, Cæsarean section in the circumstances under consideration is an operation of little risk at the present time. Formerly it was thought to be disadvantageous to operate before labour pains had started, either spontaneously or after the induction of labour, for it

¹ THE LANCET, Jan. 17th, 1903, p. 157.

was believed that if labour had not started the uterus would not contract well after Cæsarean section. This objection has now proved to be merely theoretical and, in fact, in cases of Cæsarean section performed before the onset of labour the uterus does contract as well as after a normal delivery.

In the second case we have an example of the class in which nothing has been known of the existence of pelvic contraction till labour has been some considerable time in progress and where unavailing efforts to effect delivery with the forceps have been resorted to. Such a combination of circumstances is generally considered to add greatly to the danger of Cæsarean section. While I am far from disagreeing with that view of the matter I think that the danger may be easily exaggerated. Much must necessarily depend on the exact circumstances of the particular case. The time that the second stage of labour has lasted, the state of the patient at the moment, and the probability or otherwise that the preceding vaginal examinations or manipulations have been made by someone who may be trusted to have scrupulously observed the principles of asepsis are the chief factors to be taken into account. The suitability of the surroundings for the performance of an abdominal section under aseptic conditions is also, of course, a matter of the first importance. Again, the vitality of the child as evidenced by the state of the foetal heart sounds must be ascertained as well as possible. If the heart sounds have their normal frequency the chances are that the child's vitality is so far unimpaired; on the other hand, if the heart sounds are much slower than normal the child is probably already in a critical condition as a result either simply of the prolonged labour or of the damage it has undergone from attempts to deliver with the forceps. In this case the patient, who had had one previous confinement, had been some 28 hours in labour and two attempts to deliver with the axis-traction forceps had been made before she came under my observation. The foetal heart sounds were easily heard and had about their normal frequency. Yet although the child's heart was still beating after delivery all attempts at resuscitation unfortunately failed. This is, I think, to be ascribed in all probability to the previous attempts at forceps delivery. Obviously, then, it is most desirable to miss no opportunity of recognising contraction of the pelvis early in pregnancy, for in that way if delivery has to be effected by Cæsarean section the risk to both mother and child is very much reduced.

CASE 1.—The patient, aged 29 years, was admitted into the London Hospital on March 6th, 1903, for the purpose of having Cæsarean section performed. She had been married four years and had had two confinements. In the first labour, which took place on April 23rd, 1900, she was delivered of a full-term stillborn boy. The presentation was a footling and the child was said to have been "suffocated." No instruments were used. The puerperium was normal. In her second labour on July 20th, 1901, she was delivered with forceps of a stillborn boy who was the first of twins. On the 22nd she was brought up to the London Hospital in labour with the second child. Delivery was effected by cephalotripsy at 7 A.M. on the same day. Her temperature on admission was 100° F.; at noon she had a rigor and the temperature rose to 106°. On the 25th she had another rigor with a temperature of 106.5°, the pulse-rate being 128. On August 2nd there was pain in the right hypochondriac region and there were physical signs of pleurisy. Up to the 6th there was marked pyrexia with nocturnal elevations. On that day she had another rigor, the temperature reaching 106°. On the 10th a sausage-shaped swelling was felt on the right side of the vagina close to the vulva. This proved to be an abscess and it was opened on the 12th. On the 14th a superficial abscess on the buttock was opened; it communicated with that in the vagina. A large quantity of foetid pus was evacuated. On the 21st a firm swelling occupying the right iliac region was noted. The uterus was almost fixed. The temperature at this period varied from 99° to 101°. The cellulitic swelling in the right iliac region did not suppurate. It gradually disappeared, the temperature came down, and the patient went to a convalescent home on Sept. 14th. She came to the London Hospital in November, 1902, and was then found to be about six months pregnant. She was told that she could either have labour induced at the seventh or the eighth month or that she could go to her full time and have the child so delivered that there would be little or no probability of a future pregnancy. She chose the latter alternative and was admitted on March 6th, 1903, under the care of Dr. G. E. Herman.

Shortly afterwards, owing to Dr. Herman's absence from the hospital, the patient came under my care. A consideration of the dates led me to believe that March 19th was the date on which labour might be expected and accordingly I decided to perform Cæsarean section a week beforehand—namely, on the 12th. The measurements I took of the pelvis were as follows: between the anterior superior iliac spines, 9 inches; maximum distance between the crests, 10 inches; the external conjugate, 7½ inches; and the diagonal conjugate about 4 inches. The pelvis therefore showed slight general contraction. The conjugate of the brim was taken to be rather less than three and a half inches. I performed Cæsarean section on the afternoon of March 12th, Mr. R. Norman, the senior resident accoucheur, assisting me. The child, a girl, was extracted alive and soon cried vigorously. The uterine wound was sutured with deep and superficial sutures of silkworm gut. The deep sutures were of course passed through the peritoneum and muscle only. The left Fallopian tube was found to be occluded but not dilated and it was not interfered with. A portion of the right Fallopian tube was pinched up, tied, and the distal portion removed about one-eighth of an inch beyond the ligature. The patient stood the operation well. The temperature at 8 P.M. was 100.2° and the pulse was 114. After 24 hours the temperature was normal and the pulse was 80. The patient made a good recovery; the temperature remained normal, except on one afternoon when there was a service in the ward. It fell on the next morning and did not rise again. All the abdominal sutures were out by the tenth day. The patient got up at the end of the third week and left the hospital shortly afterwards with her child, both perfectly well.

CASE 2.—The patient, an alien immigrant who spoke no English, was admitted from the outdoor maternity department into the London Hospital under my care on July 19th, 1903, at 12.30 A.M. She had been in labour since the 17th at 10 P.M. It was difficult to get much information as to her previous history. She was believed to have had one child previously in Russia. It was said to have been small and to have been delivered with forceps after a very difficult labour. On the present occasion two attempts had been made to effect delivery with the axis-traction forceps before I saw the case. The head, which lay in the second vertex position, could not be made to enter the brim. When I saw her at about 1 A.M. she was having strong pains almost every minute, the vulva was very oedematous, the os was fully dilated, and the head was in the position just mentioned. I measured the pelvis carefully and found that the distance between the anterior superior spines was 8 inches, the maximum distance between the crests was 9½ inches, the external conjugate was 6½ inches, and the diagonal conjugate was 3½ inches. The true conjugate was judged to be about 3¼ inches. The foetal heart sounds were easily heard and they seemed to be normal. The alternative methods of delivery that were considered were craniotomy, symphysiotomy, and Cæsarean section. As the child was alive and the mother's condition was fairly good I excluded the first. The choice between symphysiotomy and Cæsarean section was difficult. The oedematous condition of the external genitals influenced me to some extent against symphysiotomy and I decided upon Cæsarean section. The patient was in a very dirty condition on admission. The skin of the abdomen was first thoroughly washed with soap and water and afterwards was rubbed with a solution of biniodide of mercury in spirit; the part of the skin in relation with the operation was also thoroughly rubbed with ether. I then performed Cæsarean section assisted by Mr. A. L. Matthews, resident accoucheur. As compared with the operation when undertaken before the rupture of the membranes, it was noteworthy in the present instance how closely the wall of the uterus was applied to the child's body. On that account more care than usual was necessary in cutting through the uterus to avoid injuring the child. The placenta was attached under the upper half of the uterine incision. The child was extracted rapidly without difficulty but although the heart could be seen to be beating all efforts at establishing respiration were unsuccessful. The uterine wound was sutured with silkworm gut, an attempt was made to sterilise the patient as in the preceding case, and the abdominal wound was closed completely. In this case there was a good deal of distension for the first few days after the operation till the bowels were well opened; after that it disappeared. The patient made a good recovery and left the hospital on August 10th.

Harley-street, W.