every three days! The number shows no tendency to diminish, but rather the opposite. Levy has analysed 109 fatal cases.¹ In no instance was there any evidence of over-dosage, and in 87 per cent. of them there is evidence that the patient was in a state of light anaesthesia. He develops the view that the exact cause of death is delirium cordis, ventricular fibrillation, and supports his theory by a series of very convincing experiments upon cats. Levy believes that under light chloroform anaesthesia the heart is in a condition which is peculiarly liable to fibrillation. In this stage a variety of stimuli may precipitate fibrillation. The injection of a renalin is a most potent stimulus, and rarely failed to kill a cat under light chloroform narcosis. It is now recognized by rhinologists that adrenalin cannot safely be used in conjunction with chloroform, unless injected before the administration begins. I have been fortunate in escaping a chloroform fatality in my own practice, but I have had two or three very narrow escapes. I have, however, personal knowledge of several catastrophes. During the past year there has been a chloroform death in this hospital, and only last week one of the surgeons had an alarming experience, which nearly resulted in a chloroform fatality. Two years ago, in the Warneford Hospital, an apparently healthy young girl died under chloroform during the induction stage, and we have had at least two deaths during the past eight years at the Coventry Hospital. I know of other chloroform accidents, but during the whole of my medical life I have heard of no case of death from ether, either on the table or afterwards. Bernard Cridland told the meeting that there had been two deaths from chloroform recently at Wolverhampton, and he was always nervous when a new house-surgeon was administering it. Dr. Haynes, anaesthetist to the General Hospital, Birmingham, said that although trained in Edinburgh to use chloroform by the towel method, he now rarely administered it, because he regarded it as very dangerous. The C.E. mixture was safer, but ether was incomparably the safest of all. Beatson Hird said that he would never use chloroform unless the administrator took the full responsibility. He regarded the A.E. mixture as the best anaesthetic for eye work. It must, however, be remembered that, as we have already said, fully 85 per cent. of all deaths from anaesthetics have been caused by chloroform.

The facts and opinions speak for themselves, and they have fully determined me never to employ chloroform, either alone or with ether, to anaesthetize my patients. I have forbidden all my house surgeons to use it for any patient under my charge.

Ether has certain disadvantages in general surgery, but they are not so marked in the short anaesthesia demanded in our work as during longer operations. It is a very disagreeable drug to breathe, but the use of nitrous oxide gas during the period of induction completely overcomes this objection. There is in some patients a tendency to congestion and to the excessive secretion of mucus in the respiratory passages; but in most cases these phenomena do not arise during the early stages of anaesthesia, and a short eye operation will be completed before the secretion of mucus becomes troublesome.

It has been suggested that the apparatus used for inducing ether anaesthesia is apt to incommode the operator. This is by no means the case. If such a machine as Clover's inhaler be employed, it is perfectly easy to remove it when the operation is being performed. If the procedure be a long one, the inhaler can be replaced by a piece of lint or gauze, and ether can be given by the open method, or the open method may be adopted from the first. I have, however, without inconvenience, carried out hundreds, I think I may say thousands, of operations upon the eyelids, at the British Ophthalmic Hospital, Jerusalem, while ether was administered from a Clover's inhaler by an Arab boy. I have in more recent times performed several squint operations in the same manner, and the inhaler did not worry me in the very slightest degree. The absolute freedom from any anxiety as to the safety of the patient enables one to concentrate one's whole attention upon the details of the operation.

Its opponents state that ether is liable to cause pneumonia and bronchitis. I have had no experience of these complications either after ether or chloroform. As a matter of fact, statistics show that lung complications are

enormously more frequent after chloroform than after open ether anaesthesia. The following figures were given by Dr. Rood at the Liverpool meeting of the British Medical Association.² Korte had 7.2 per cent. of lung complications in 3,909 laparotomies under chloroform; Czerny had 3.9 per cent. in 1,302; Kummel 2.5 per cent. in 1,754; and Trendelenburg 5.4 per cent. in 1,829. With open ether anaesthesia Krönlein only had 0.56 per cent. in 1,409 cases. The average for chloroform is 4.75 per cent. against 0.56 per cent. for open ether. In other words, chloroform is in this respect eight times more dangerous than ether. Ether is also far less likely to produce degenerative changes in the liver and kidneys than chloroform. Leedham-Green, in a paper read at the same meeting,³ said: "There is no doubt that chloroform is six or seven times as dangerous as ether, and, as at present administered in most of our large hospitals, is attended by very serious risk to life—so serious that a very grave responsibility rests upon those who use it as a routine anaesthetic." My experience fully corroborates this view, and I think that any one who has a death from chloroform when ether could have been used is morally responsible for the loss of his patient.

I shall not consider the methods of giving chloroform: they are all dangerous. The most recent Harcourt type of apparatus, which gives a 2 per cent. vapour at will, has proved no less dangerous than the simple towel or lint mask.

Ether may be given either by the open method or by a Clover type of apparatus. I prefer to induce with gas and ether mixed, and then for long operations to continue with the open method. It is most essential to keep the jaw well forward, the lower teeth must be kept well in front of the upper. I find it most difficult to get this done, and in consequence patients become cyanosed. It is rarely necessary to move the index beyond the quarter sign; most young administrators use far too much ether, and then when faced with difficulties blame the ether.

In conclusion, I would ask that ether should be given a fair trial, but that it be correctly administered. A cataract extraction is the final test of an anaesthetic; I have performed one with perfect ease under ether, but I arranged to have a first class administrator.

REFERENCES.

- ¹ *Proceedings of the Royal Society of Medicine*, vol. ii. No. 8.
² *BRITISH MEDICAL JOURNAL*, September 14th, 1912. ³ *Loc. cit.*

MYELOID SARCOMA OF THE FEMUR, WITH PATHOLOGICAL FRACTURE.

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THE following case raises certain interesting points affecting diagnosis of pathological fracture:

Miss G., aged 28, a children's nurse, who had suffered from no previous diseases of importance, except that she had had haematemesis on several occasions (the last during February, 1914), came under treatment with the following history:

Towards the end of December, 1913, she was carrying a pail of water down some stone steps, when she slipped and struck the inner side of her knee against one of the steps. She experienced a sickening pain, and had to sit down for a few moments. A day later a bruise appeared, but the pain soon ceased, and she forgot all about the accident until March, 1914, when she was troubled by aching in the muscles behind the knee.

On March 21st, as she was stepping off a bus (which was not moving at the time), her knee suddenly gave way under her, and she fell. She was in great pain, was unable to rise, and could not straighten the limb. On examination at home soon afterwards the knee was seen to be slightly flexed and externally rotated. Any attempt at passive movement caused great pain. Dr. George diagnosed laceration of the internal semilunar cartilage, manipulated the leg as well as possible, and bandaged it up. As the position was still not perfect, however, the patient was transferred to hospital, and a general anaesthetic was administered. The leg was then easily put straight, and went back with a click strongly suggestive of the reduction of a dislocated semilunar fibro-cartilage. On

repeating the manipulation, the cartilage could apparently be felt, slipping in and out of position.

For a time the patient was much relieved. At first there was much fluid in the joint, but this disappeared under massage and passive movement. She was able to walk, although there was a little tenderness on pressure over the internal condyle. The only movement that caused real pain was full flexion, which always gave rise to aching at the back of the joint. Full extension (which would tighten up the posterior ligament of the joint, and press upon the cartilage if it were still displaced) could be quite painlessly performed. The pain persisted, and it was found that the knee was still an inch larger in diameter than the opposite one, even though no fluid could be demonstrated. Tuberculosis or osteo-arthritis was then suspected, and a skiagram was taken. It showed a clear, well-defined cavity in the interior of the internal condyle of the femur, which was somewhat expanded; the wall of the cavity was thinned out and quite even in outline. There was no blurring of the definition of the parts around, nor any of the "fuzziness" that is so characteristic of tuberculosis. On careful examination the plate also showed a fracture of the internal condyle, involving the knee-joint, but this was missed by everybody at the time. Had it been observed, it might have led to a more detailed diagnosis being made before operation.

It was decided that the case was one of endosteal sarcoma following the injury of December, 1913. Mr. R. P. Rowlands, who saw the patient in consultation, concurred in this suggestion, and advised that the limb should be amputated, inasmuch as it was not possible to perform any conservative operation that would not entail much subsequent deformity and disability.

On May 2nd, the patient was anaesthetized with Barker's stovaine-glucose solution by spinal injection, and rendered just unconscious with a minimal amount of ether, given by the drop method. She had also had morphine, gr. $\frac{1}{2}$, and atropine sulph., gr. $\frac{1}{100}$, an hour previously. Axillary saline infusion was also administered, and Dr. George, assisted by Dr. E. C. Andrews, amputated the limb through the thigh by means of unequal anterior and posterior flaps. At the conclusion of the operation the patient's pulse was strong and regular (70), the colour was good, and there were no signs of shock. Within half an hour of leaving the theatre the patient was talking comfortably to her nurse. The after-history was uneventful, and up to the present time no recurrence has taken place.

On examination of the part removed, it was found that the internal condyle of the femur was occupied by a cyst containing fluid blood, not under pressure; the cyst-wall was composed of dark, soft, maroon-coloured membrane, which could easily be stripped off and showed, on histological examination, the characteristic structure of a spindle-celled sarcoma, intermixed with a number of giant cells. The bony wall was so thin that it could easily be indented with the finger in several places, and there was a supracondylar fracture which had involved the knee-joint. A thin membrane stretched across the line of fracture, showing that union was at any rate tending to occur. The structures outside the internal condyle, in its immediate vicinity, were involved in an extension of the growth, as was demonstrated by the microscope as well as by the naked-eye appearances, but there was no extension towards the popliteal space, or up the thigh.

Looking back upon the case, one realizes that more importance should have been attached to the persistence of localized tenderness upon pressure over the internal condyle—a very valuable sign of a fracture in many cases. Such tenderness, moreover, is often seen in cases of endosteal sarcoma. Local tenderness betokens a local lesion. If the case had been one of tuberculosis, it is extremely improbable that it would have remained localized to one part of the joint for any length of time; it would have involved the whole cavity, and flexion, pain on movement, or pyrexia would have ensued. Possibly, also, on very detailed examination under the anaesthetic, the isolated movement of the internal femoral condyle might have been observed, if the idea of fracture had occurred. A skiagram taken then would have led to an earlier diagnosis of the existence of the growth. For it seems probable that it was the initial injury, the striking of the knee against the stone step, that gave rise to the sarcoma, and that the second trivial accident caused a pathological fracture. On reflection, it seems hardly possible that a mere step from a stationary bus to the ground could have caused such severe symptoms as were present in this case, unless some major injury had occurred, and perhaps the diagnosis of pathological fracture should at once have been discussed. At any rate the case is very instructive, though it is easy to be wise after the event.

As regards the technique of the operation, it is only necessary to comment upon the importance of the measures that were employed to abolish shock. Anxiety beforehand, and pain afterwards, were alike avoided by the use of morphine, and unconsciousness was induced and maintained throughout a fairly lengthy operation by the use of only two ounces of ether, even though given by the

open method. The conjunctival reflex was brisk throughout, and the anaesthesia was so light that the patient was constantly moving her head and fingers; nevertheless, the relaxation of the lower limbs was absolutely perfect, she was receiving no painful stimuli whatsoever, as the nerve-blocking by the stovaine interrupted them, and therefore her pulse never exceeded 70, and shock was entirely absent. The combination of spinal analgesia with the lightest possible general narcosis is the ideal anaesthesia for these high amputations.

TREATMENT OF DRY PLEURISY BY TEMPORARY PARTIAL ARTIFICIAL PNEUMOTHORAX.

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THE following case well illustrates the benefit which may be derived from temporary separation of the two inflamed surfaces of pleura in a case of long-standing dry pleurisy by a layer of nitrogen, which in this way acts as a pneumatic splint, by means of which the inflamed parietal and visceral pleura may be put at complete rest, and conditions are produced under which repair and recuperation may be brought about—a condition which is not allowed them by Nature whilst they are in actual apposition. The length of time for which the so-called splint may be applied may be regulated by the requirements of the case.

My object in publishing this case is not by any means to advocate this method of treatment for every case of dry pleurisy, it is intended merely as a suggestion that the method might be well worth trying in similar cases of obstinate and long-standing dry pleurisy, where more recognized and better known means of treatment have failed.

A lady, aged 50, was sent to this sanatorium on May 7th, 1914. The recent medical history bearing on her present illness was that the right kidney had been removed for tuberculous disease in 1911. She had a sharp attack of dry pleurisy in September, 1913, the pain from which had continued ever since.

In January, 1914, four small haemoptyses occurred, for which the patient was confined to bed for a month. There was a further small haemoptysis in the beginning of March, and since then the patient had been living quietly at a South Coast watering-place.

Examination of the chest on admission revealed a healed tuberculous lesion at the left apex. There were signs of much dry pleurisy over the middle and lower lobes on the right side, a coarse leathery rub being audible from the fourth rib in front and the sixth dorsal vertebra behind, downwards to the base of the lung. Acute pain was complained of over this site. The patient was kept at rest in bed, and the usual palliative methods of treatment adopted, without bringing about any amelioration of the symptoms. Throughout this period the temperature and pulse-rate were normal.

After a lapse of ten weeks—no improvement being apparent—it was thought that gentle exercise might prove beneficial, and walking exercise, in gradually increasing distances, was commenced until a distance of two miles was reached. Still the pain proved most persistent, and as it was materially interfering with the patient's rest at night, she expressed her anxiety that something "radical" might be done to improve matters for her. The possibility of producing a partial temporary artificial pneumothorax was suggested, and the pros and cons were put impartially before her; after some consideration and consultation with her relatives, she requested that this treatment might be attempted.

On October 11th, 1914, under the influence of 0.5 c.cm. of omnopon-scopolamine, given half an hour previously, and a local injection of novocain, a Saugmann's needle was introduced into the sixth right intercostal space in the posterior axillary line. No difficulty was experienced in finding the interval between the parietal and visceral layers of the pleura, and 200 c.cm. of nitrogen were introduced. On the following day the patient still complained of pain, and on October 13th a further injection of 300 c.cm. of nitrogen was given at the same site. On the day following, auscultation showed the breath sounds over the right base