be more quickly performed and that the patient frequently felt nothing at all or slept peacefully at intervals throughout the operation. The drugs produced no ill-effects and sometimes enabled the patient to sleep for the remainder of the day.

Technique.

1. *Induction of amnesia.*—For each individual it is necessary to estimate what dose of the drugs will be required and how long it will take to produce the desired effect. Most frequently I give hyoscine 1/100 gr. and morphine 1/6 gr. an hour and a half before the operation and morphine 1/4 gr. half an hour later. The patients' ears are plugged with wool and the room is darkened at the time of the first injection.

2. *Syringe and needles.*—I use a 20 c.cm. Record syringe, with Barker's steel spinal needles and hypodermic needles.

3. *The anæsthetic solution.*—Dr. Dunhill uses 200 c.cm. of saline containing 0.1 per cent. adrenalin 20 m and novocaine 6 gr. Hoffmann and Kochmann¹ recommend—

Novocaine	0.2 g.
Sol. pot. sulph. (2 per cent.)	40 g.
Sol. sod. chlor. (0.9 per cent.)	ad 200 g.
Sol. suprarenin hydrochlor. (0.1 per cent.)	24 m.

The addition of potassium sulphate to a novocaine solution is said to aid its effect, and magnesium sulphate is sometimes used with a similar object. Whatever solution is employed should be freshly prepared, but need not be warmed before use. Of the two chief ingredients the adrenalin is the more important; it diminishes oozing from the subcutaneous tissues and prevents too rapid absorption of the fluid. I doubt whether the novocaine is really of any value at all at so low a concentration, as I have been equally successful with normal saline alone except for a slight increase in capillary hæmorrhage. I think the anæsthesia is produced principally by distension of the tissues, since the large volume of the fluid seems to be the most important factor.

4. *The injection.*—The injection can be made through one median puncture, and as the introduction of a large spinal needle is painful, it is well to begin by infiltrating the puncture area with a fine hypodermic needle. With very nervous patients I sometimes introduce a further refinement by laying a pad soaked in 1 : 20 carbolic on the neck beforehand to diminish sensibility to the prick of the needle. All the tissues superficial and lateral to the gland can be infiltrated, but the fluid does not penetrate the capsule of the gland and seldom reaches the trachea; posteriorly the structures never show any evidence of infiltration. The injection is begun half an hour before the operation while the patient is still in bed; he is then conveyed to the operation theatre, and by this time is usually drowsy and takes no interest in subsequent proceedings. It is not necessary to inject any more of the novocaine solution during the course of the operation.

5. *The operation.*—During the operation the theatre is kept as quiet as possible and no talking is allowed; the patient may sleep the whole time, moan subconsciously, or rouse himself at intervals to ask questions. Occasionally the limbs move slightly, but whatever impressions the brain may receive the mind retains no recollection of them. The loss of all idea of time is a noticeable feature, and when asked how long he supposed the operation took the patient will usually under-estimate the time by half an hour or more; he does not afterwards feel that he has passed through any painful ordeal, and in most cases the pulse does not rise appreciably during the operation. I have not always succeeded in producing complete immunity from discomfort, but with increased experience imperfect anæsthesia has become exceptional.

6. *Post-operative course.*—I always drain the wound and close the incision with clips; the drainage-tubes and some of the clips are removed two days after the operation and, if the wound then shows no tendency to gape, the remaining clips are removed on the following day. In the majority of cases the post-operative course is extraordinarily free from discomfort of any sort, the patient altogether escaping the physical and mental distress so apt to follow in the wake of general anæsthesia. The narcotics produce no ill-effects unless given in excessive doses when headache and thirst may be complained of; headaches are readily alleviated by aspirin and thirst by administration of fluids in any form most palatable to the patient.

The temperature is always raised for a few days, but usually rises no higher than 101° F.; in some cases and for no apparent reason it remains irregular for two or three weeks, and then slowly falls to normal, provided that absolute rest is enforced. The pulse reaches its highest point on the second day, and thereafter falls steadily during the next ten days to a level below that recorded before the operation. I have not found that local anæsthesia increases the likelihood of suppuration, as the wound nearly always runs an aseptic course and heals by first intention, but the formation of a hæmatoma is not unlikely to occur if more than 0.1 per cent. adrenalin 20 m has been used in the anæsthetic solution. Occasionally alarming symptoms arise and call for prompt treatment. Great acceleration, and particularly irregularity, of the pulse indicate fatigue, when an effort should be made to induce repose of body and of mind; in these circumstances a dose of paraldehyde in rectal saline will often bring about a marked improvement. If, in addition, the patient is dyspnoic, cyanosed, and restless the condition is more serious; the wound should first be examined to make sure that drainage is not obstructed, and then strophanthin should be injected intravenously; for this purpose I keep in readiness a freshly prepared solution containing strophanthin gr. 1/250 and adrenalin (0.1 per cent.) 1 m, in 5 m, the effect of which is instantaneous. Inhalation of oxygen is sometimes useful in relieving cyanosis.

Soreness of the throat and difficulty in swallowing are minor complaints and are sometimes distressing; they can be relieved by the use of suitable lozenges and by giving small pieces of ice to suck. Vomiting hardly ever occurs as a result of the operation and is never serious by itself, though attacks of vomiting may have been one of the manifestations of the disease. The presence or absence of various complications depends largely on the severity of the disease and on the area of the cut surface of the gland from which secretions may be absorbed into the circulation.

Conclusions.

The combination of hyoscine-morphine amnesia and local infiltration is an absolutely safe method of producing anæsthesia, possessing neither disadvantages nor contra-indications; it is preferable to local anæsthesia alone, and more rational.

THE TREATMENT OF EXTENSIVE SEPTIC WOUNDS.

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It seems that the chief use of gauze dressing is that it protects the wound from secondary infection from outside, and that if a method of treating wounds can be devised in which the wound is protected from outside infection, and at the same time the objectionable results of the use of gauze dressings are eliminated or diminished, an advance in the right direction will have been made. With this object I have, for the last six months, been treating septic wounds with much discharge with no permanently applied dressing. The method adopted is as follows.

Description of the Method.

The ordinary incisions for opening up recesses in pockets are made as soon as the patient has recovered from the result of transfer to the hospital. Incisions and openings so made are performed with the idea of obtaining the maximum effect of gravity in the subsequent treatment. The wound is then packed with gauze and bandaged in the usual way—the sole object in this being to assist in stopping oozing of blood. All dressings are removed 48 hours later. The wound is then syringed with some mild antiseptic—e.g., boric or weak eusol lotion. A guard made from perforated zinc, cut in an appropriate size and bent in the form of a cradle, is placed over the limb or part wounded and covered by a sterilised towel. If possible, an ordinary cradle is placed over the whole. Any discharge from the wound is allowed to run out from the wound, and is taken up by a sterile pad of wool or sphagnum moss so placed as not to touch the wound. At intervals varying with the amount of discharge, on an average twice a day, or in some cases more frequently, the nurse lifts the towel and zinc guard, syringes or swabs the wound, and changes the pad. The guard and towel are then replaced. This treatment is continued until all pockets and recesses have been closed by granulation, the granulating surface is

¹ Deutsch. med. Woch., 1912, No. 48.

smooth, and the discharge has practically ceased. The wound is then dressed in the ordinary way with gauze and wool.

A fair number of cases (40 or 50) have been treated in this way, and in none of them have any bad effects been observed as the result of leaving the wounds open. In some of these the wounds were so extensive, and the discharge so foul and profuse, that amputation on admission was seriously considered. Wounds infected with a great variety of organisms—all those commonly met with in such wounds—have been treated in this way with success.

Occasionally it has been necessary to open pockets that have formed after the treatment has been started, but these were all cases in which it had been impossible to obtain a proper flow of discharge by gravity. In these cases a small wick of gauze is laid wherever a recess is found and left hanging over the edge of the wound to assist in the drainage. These wicks are never so large as to occupy more than a quarter of the opening of any recess.

Its Difficulties and Advantages.

The difficulties experienced in this method of treatment have been threefold: 1. Difficulty in some cases in arranging the wound by operation for opening pockets or by altering the position of the patient so as to obtain the greatest effect of gravity. This difficulty is to some extent overcome by the judicious use of very small gauze wicks and by the more frequent cleansing of the wound by syringing. 2. The difficulty in continuing the treatment at night when the patient is asleep and restless, as any considerable movement of the wounded part may disturb the covering and bring the wound in contact with unsterilised material. This is overcome in some cases by placing the limb in a splint. In others it is necessary to place an ordinary dressing and bandage on at night, but the number of cases in which this has had to be done is small. 3. Some parts of the body are difficult to keep covered in the manner described—e.g., the neck and side of the trunk—and in some parts—e.g., the face and head—it is impossible. In the case of the neck and side of the trunk it is possible to build up a rampart of sphagnum moss round the wound and to keep these in place with a towel or bandage in the usual way. The principles of perfectly free and open drainage is thus not interfered with.

The advantages following the employment of the method have been found to be: 1. Perfectly free drainage. 2. Absence of the tendency to pocket, provided the wound is exposed and so arranged as to allow gravity its maximum effect. 3. Absolute painlessness of dressing even the most extensive wounds—an advantage of prime importance for the general condition of the patients. 4. The dressings can be performed with a complete absence of any manipulation of the wounded part, as no bandages have to be removed or applied. 5. A great economy in dressings is effected.

With regard to the disadvantages mentioned above, the following comments are apposite: 1. All the advantages of the absorbent power of gauze in assisting drainage contrary to gravity can be obtained by the use of small wicks, with none of the disadvantages of the closed dressing. 2. Wounds (so severe as to need any special care in treatment) of "difficult parts," such as the head and neck, are only occasionally met with in general hospitals in England. A circular rampart of absorbent material, covered and kept in place by a sterile bandage or towel, has been effective in the small number of these cases that have come under my care.

The first effects of this method of treatment are somewhat disturbing to the mind of a surgeon accustomed only to the appearance of wounds treated in the ordinary way. The edges of the wound and parts of the surface over which the discharge is not flowing tend to become hardened and small scabs develop. These should be removed as soon as they have formed, and can usually be prevented from forming altogether by careful cleansing and swabbing of the wound. Should there be any recesses in the wound these must receive particular attention at the dressing, as there is a tendency for the discharge to coagulate and block up small fissures. Provided the dressing is done with ordinary care this can in all cases be prevented. In cases where deep pockets are present that cannot be effectively opened a rubber drainage-tube is employed to prevent premature closure. In cases where an ordinary closed dressing has to be applied at night a wet one is always used—usually a hot fomentation. Any tendency towards drying of the wound is thus prevented, even when it has been allowed temporarily to occur. The hypothetical objection that the dried secretion may block the recesses of the wound has not been proved to be valid by experience.

Clinical Notes : MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

CÆSAREAN SECTION THREE TIMES ON THE SAME PATIENT.

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THE following case shows that Cæsarean section, sepsis being excluded, may be repeated without any impediment from scars or adhesions.

Notes of Case.

In April, 1907, the patient, then aged 29, in her first pregnancy, had reached term when labour pains began. A medical practitioner, recognising that natural delivery was impossible, sent her forthwith into hospital. On admission it was noted that she was a spare woman of medium height, who presented no external deformity. The pelvis resembled that of a boy. Measurements made subsequently, and repeated later, were as follows: True conjugate, $2\frac{1}{4}$ in.; transverse diameter, also outlet between ischial tuberosities, not much wider than conjugate; external conjugate, $7\frac{1}{2}$ in.; between anterior superior spines, 9 in.; between crests of ilia, $10\frac{1}{2}$ in. The uterus was high up; the cervix could scarcely be touched with the finger; the unruptured membranes were bulging through the os. No sepsis had been started. Cæsarean section was done within 24 hours of the first labour pain.

Mother with her three children after third Cæsarean section.

The second operation was performed in October, 1910, on what was reckoned to be the 230th day of pregnancy; labour had not commenced but the breasts had become full.

Cæsarean section for the third time was carried out in July, 1918, with the patient in the same state as at the second operation.

Account of Operations.

There was no essential difference between the three operations. The incision through the abdominal wall was a median one; at the second and third operations a fine strip of scar was excised, there was then no sign of hernial protrusion, nor of adhesion to the peritoneal aspect.

The incision into the uterus was also through the middle line, without encroaching upon the cervix or uppermost end of the fundus. At the second and third operations the abdominal wound was well retracted, but no one present could see any sign of scar in the uterine wall, or of adhesion to the uterus.

On opening the uterus the child, followed by the placenta and membranes, was removed with one sweep of the hand. At