breathing a few hours later became regular. Evening temperature 101.3° . On June 12th the morning temperature was 100.4° , patient sleeping comfortably. In the evening knee-jerk returned; patient could understand what was said to him. On June 13th he could answer questions; complained of severe headache; evening temperature 98° . June 17th. To-day for the first time, nine days after the fracture, there was a discharge of bloodstained cerebro-spinal fluid from the ear. This discharge lasted till July 14th, that is, for four weeks. The patient left the hospital quite well on July 25th.

CASE II.—Dr. Hawkins of Broxbourne kindly lets me publish this case. The patient, a middle-aged man, was thrown out of a trap on March 13th last, and was picked up unconscious, with no visible injury except a trivial cut over the left eyebrow, and a broken wrist. The left pupil was widely dilated and immovable, and there was complete loss of power, but not of reflex movement, in the left arm and leg. For a day or two he remained wholly unconscious; then there came a return toward consciousness, and he could answer questions, and said a word or two now and again; and at nights he was restless, talking wildly.

He remained in this state for a fortnight. On the fourteenth or fifteenth day he took a change for the worse; there was a slight rise of temperature, with quickened pulse and respiration, more complete paralysis, and deeper unconsciousness. I saw him for the first time on April 1st, the nineteenth day; the temperature was normal that day, and we decided to wait. Next day it rose to 102° . On the twenty-first day, with the help of Dr. Hawkins and Dr. Hoskins, I exposed the bone in the left temporal region, and found it fractured but not depressed. The chief line of fracture ran downward to the base of the skull. While I was examining the fracture blood began to well up through it so freely as to hinder the use of the trephine, and I had to use a mastoid chisel and a cutting forceps. The bleeding, which came from a vein of the dura, stopped so soon as it was exposed. The dura was very tense, and did not pulsate; it was incised, and about a drachm of clear fluid was let out; the dura then fell inward over a depression of the brain, and pulsated freely. A strip of gauze was laid over it, and the wound was closed. There was free bleeding into the dressings a few hours after the operation, so that he lost, at and after the operation, about 12 oz.

For the next few days he seemed a little better, and on April 7th the loss of power was less marked, and the temperature was normal, and he was quiet and sensible, and for the first time spoke of his accident, remembering how it had happened. On April 10th, the twenty-ninth day, he relapsed again, and next day he had a rigor, temperature 103° , and signs of pneumonia at the base of the lung. He was now bled by Dr. Hawkins to 12 oz., and that evening his temperature fell to normal, and he was quite sensible.

During the next week, April 12th to 18th, he very slowly gained ground, the pneumonia cleared up, and he became stronger and more responsive, recognizing those round him, and fairly sensible during the day; but at night he was very restless and excitable, trying to get out of bed, and talking and behaving like an insane person. Sensation was almost unimpaired, both in the arm and in the leg, and there was no impairment of vision. On April 19th, for the first time, thirty-two days after his accident, he began to move the arm, and could move the leg more freely; he was still very noisy at night.

On June 13th, Dr. Hawkins writes, "He is recovering slowly; he can walk with a little assistance, and sits up to meals. His head-symptoms are also subsiding."

These two cases have not much in common, except that in each of them recovery seems to have been due to venesection. It may be well to take the second case first. Here the evidence is incomplete, because the occurrence of pneumonia confused the issue; but it seems almost certain that the temporary improvement after the operation was due partly, if not wholly, to the loss of blood at the time, and that the improvement which began on the day of the venesection was due to the venesection, and to that alone.

The other case speaks for itself. Here was a man who, thirty-six hours after fracture of the base of his skull, was profoundly unconscious, with a temperature rising rapidly to 104° , and the intensest degree of Cheyne-Stokes breathing. It was impossible to doubt that he was dying fast; but so soon as he was bled to 20 oz. plus 12 oz. he began to get better, and made a complete recovery. The delay of nine days before the cerebro-spinal fluid began to flow from the ear is hard to understand; probably it was due to the lowering of the blood pressure by the venesection.

If venesection in cases of this kind could restore consciousness more or less for a few hours only it would still be a valuable method. But these two cases seem to show that it may in this or that case, as it were by chance, bring about not mere temporary improvement, but recovery.

SANATORIA FOR CONSUMPTIVES IN MADEIRA.—Prince Frederick Charles of Hohenhohe has asked permission of the Portuguese Government to erect vast sanatoria in Madeira. He has offered by way of payment to the State or to charitable institutions one third of the net profits, in the meantime paying a deposit of £20,000. The Prince is said to be forming a company, with a capital of £2,000,000, which will undertake to open within two years two magnificent sanatoria in Madeira.

THE BURIED UNABSORBABLE LIGATURE AND ITS SEQUELAE.*

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SURGICAL literature for years past has teemed with references to, and with explanations and excuses for, the perverse behaviour of what has been euphemistically termed "the permanently buried unabsorbable ligature."

That a sterile unabsorbable ligature, of which silk may be taken as the type, planted in an aseptic wound ought to remain permanently buried is perfect in theory, but when in practice it is found that such a ligature is shed, its reappearance is accounted for by the statement that the ligature must have been infected at the time of the operation.

The following remarks refer to the soft tissues of the body, more especially the muscles: The rigid tissues, such as bones, come in rather a different category, although even in the case of the bones it is not an infrequent occurrence for a screw or wire, after lying quiet for months, to create a disturbance which necessitates the removal of the offending body.

During the past eleven years I have seen, both in hospital and private practice, frequent examples of this process of ligature shedding from wounds which have healed by first intention and have remained healed for weeks, months, or even years before disgorging the unabsorbable ligatures.

The ligature of an ovariectomy pedicle is frequently a beautiful example of this process. I have seen such a ligature removed four years after its insertion, when it was caught in the act of perforating the bladder. Doran has quoted a case in which such a ligature had to be removed ten years after its insertion.

A recent case which has come under my notice is that of a lady who had a painful loose kidney fixed with sutures by a well-known surgeon. The wound healed *per primam*, and the kidney pain was cured, but a month later the loin became tender, a sinus formed from which, after many weeks of annoyance, appeared the silk ligature, and at the present time, six months after the operation, the persistence of a tender sinus suggests that other ligatures will follow.

In explanation of cases such as these, I am asked to believe that: (1) The ligatures were infected at the time of the operation, but that (2) the infecting bacteria did not prevent sound union by first intention, and (3) these bacteria, after lying dormant for many weeks, months or even years, during which time they neither injured, nor were injured by, the tissue cells among which they lay, have suddenly broken out into activity and have caused the ligatures to be shed.

I am unable to accept such a string of improbabilities. In a patient peppered with shot, the leaden pellets continue to be extruded for years after the apertures of entrance have healed. These shot are not accused of being septic from the time of their insertion to the time of their extrusion. In a patient peppered with silk, the pieces of silk are similarly shed, but are said to have been septic throughout.

I grant that the sinus from which the shot or silk appears is septic and also that the shot or silk at the time of its reappearance is septic, but that is a very different thing from admitting that the foreign body has been septic from the day of its insertion.

I am fully aware that some ligatures are not shed, that is to say, they do not escape from the patient's body, but how many of them can be found in their original situation a year later? Very few, and if they have been placed in muscular tissues which are frequently and actively contracting, search for such ligatures is usually futile.

What has happened is this. A ligature uniting muscles which are constantly changing their relative positions and forms, gradually cuts its way through until it lies loose among the tissues. Then one of two things takes place.

1. If unexposed to muscular action the ligature becomes more or less encapsuled, or (2), what is much more probable, it is propelled by the movements of the muscles which surround it, in the same way as a needle is moved by muscular action, and drifting with the tide, ultimately settles in some backwater, where it can lie in peace undisturbed by muscular contractions. In this haven of rest the foreign body, for such it really is, becomes more or less encapsuled by the action of the surrounding cells. In the first instance the ligature is encapsuled at its original site, in the second it becomes encapsuled at a distance from its first habitat.

* Read before the South Western Branch of the British Medical Association.

Thus far the process has been an aseptic one; bacteria have played no part. Why, then, does not the ligature remain buried for ever? The reply is that it would do so were it not for the advent of bacteria, which have a special affinity for damaged tissues, in this case the tissues surrounding the foreign body.

The presence of bacteria from time to time in the blood stream is an admitted factor in the infection of deeply-situated organs, such as bones, when the infection takes place without any breach of surface, as in cases of osteomyelitis. It is from the blood stream that many of these ligatures become infected. In some cases the bacteria are derived from viscera in which they normally live—for instance, from bowel—which may be adjacent or adherent to the ligature. The ligature has not always been infected any more than the bone has been.

The use of unabsorbable ligatures and sutures results from an exaggerated idea of what ligatures are capable of effecting. Ligatures simply hold tissues in apposition temporarily while they are uniting, and unless the tissues grow together not all the silk and metal in the world will produce permanent union, and when this union has taken place the ligature has served its purpose, and the sooner it disappears from the scene the better for all concerned. A ligature which lasts at most a few weeks will do all that is necessary or can be expected.

Catgut, if necessary hardened by chemical reagents, answers this purpose, because after a few weeks it is disintegrated, and as a definite body ceases to exist. Catgut, prepared by either the formalin or xylol process, produces immediate results equal to those of silk, and being absorbed within a few weeks causes none of the annoying sequelae inseparable from the use of unabsorbable material. The unabsorbable ligature must from its nature always be a foreign body, which, as soon as it becomes infected, but not before, will result in suppuration.

The soft tissues of the human body are unsuited to act as a cemetery for pieces of knotted silk and twisted metal, and if surgeons persist in peppering their patients with these foreign bodies, no matter how freely boiled or carbolized, they must expect them to be extruded at varying intervals, just as shot are worked out a person who has been peppered with lead.

THE TREATMENT OF HYDROCELE BY THE METHOD OF SETON.

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At the spring meeting of the Edinburgh, Fife, and Lothian Branches of the British Medical Association I showed five patients in whom cure had taken place by means of the above method. The ages of the patients were 47, 16, 9, 2½, and 1 year. In the case of two of them nine months and seven months had respectively elapsed since treatment; in the others treatment had been more recent. In two of the cases, previous treatment by tapping and by needling the inner wall of the sac had been tried without effect. In four other patients, referred to but not exhibited, cure had occurred in two cases, recurrence in two cases. The former were young children, the latter adults of 69 and 49 years of age respectively, in whom the condition had existed for many years. Both of the latter cases had previously been repeatedly tapped, and one of them, if not both, had been injected with iodine without success. Since the meeting, one further case, an infant, has been treated by the method, and so far no recurrence has taken place.

The treatment of hydrocele by means of a seton, combining as it does two other treatments of hydrocele, namely irritation of the sac and drainage of its contents, has probably suggested itself to others besides the writer as an apparently original method. It is, however, very far from being new, although it has dropped out of modern textbooks. It was, indeed, employed as long ago as the time of the Arabian surgeons. Later, it was revived by Percival Pott, and practised by Sir Astley Cooper and others. It, however, again fell into disuse.

Two reasons probably account for this. In the first place, it is certain that the method cannot be relied on invariably to cure hydroceles in adults, and it is quite useless in old-standing cases of hydrocele with thickened walls. But no more can be claimed for injection, however thoroughly done,

or for any other method short of (a) excision of the parietal layer of the tunica vaginalis, or (b) Winkelmann's more recent inversion operation. Secondly, there is the risk of sepsis. Probably it is this which has been the important factor in causing the method to be abandoned.

That sepsis not infrequently occurred in this region, one can readily imagine, and the older records show that it did. With proper care, however, sepsis nowadays should very rarely take place, and it would therefore seem worth while to give this old method a new trial under happier conditions.

I do not venture to draw any absolute conclusion as yet from so small a number of cases, but the impression I have gathered in comparing these results with those of previous cases treated by injection is distinctly favourable to the seton. Should further experience show this impression to be well founded, the seton may prove of service to those who do not care to undertake either of the two radical operations referred to.*

The actual method adopted by the writer is slightly different from any of those briefly referred to in the older books. A sterilized trocar and cannula of the ordinary pattern, but rather longer than usual, are thrust from behind forwards completely through the affected side of the scrotum. The trocar is withdrawn, and two or three strands of silkworm gut are passed through the cannula and secured. The cannula is next partially withdrawn, and the hydrocele emptied. The cannula is then completely withdrawn, and the two ends of the seton tied together in front of the scrotum. Horsehair or silk can also be employed; if ordinary catgut is used, the knot may soften and come undone. It is important to leave some "slack" to allow for any subsequent swelling of the parts within the loop.

This little operation can easily be carried out in thirty seconds. No local anaesthesia is necessary. If the trocar is sharp, no more, or very little more, pain is felt than in ordinary tapping, and much less than in injection of iodine without cocaine.

After a variable number of hours, swelling of the epididymis, and sometimes of the cord, generally occurs, and is accompanied by some tenderness, which lasts for a few days, or until the removal of the seton. The swelling may be very marked, and may persist for some weeks after the removal of the seton. It is difficult to say when the seton should be taken out. The shortest period during which it was retained in any of the above cases was two days. On the other hand, in one of the chronic cases, in which treatment proved useless, it was kept in for two and a half months! Probably four or five days is sufficient, if a cure is going to occur at all. While the seton remains in, and for a day or two afterwards, a moist antiseptic (boracic) dressing is kept applied. This encourages drainage, is soothing, and protects the parts.

Since the danger of sepsis is the point most to be considered, it is, perhaps, not superfluous to mention how this, in the writer's opinion, may without very much trouble be avoided. The whole neighbourhood is first well washed with soap and water. In adults it is safer to have the pubes shaved as well. In infants a boracic, and in adults a weak carbolic, fomentation is then applied for some hours. Just before passing the seton, the scrotum is washed with spirit. The retention of the dressing can be satisfactorily accomplished if the entire scrotum is enveloped in the dressing, if a small aperture be made for the penis both in the lint and in the gutta serena tissue or jaconette which covers it, and if a suitable bandage be applied. A double spica of the groin, with "variations" across the scrotum, answers well, slits being made for the penis in some of the scrotal turns, and plenty of safety pins used. In infants, a small piece of jaconette is usefully pinned on over all.

Where a hydrocele, either of the scrotum or cord, obviously communicates with the abdominal cavity, neither setons nor injections should, of course be employed. Here excision alone should be performed. In children, however, there is often some doubt as to whether a minute communication exists or not between the two sacs. I do not think this uncertainty should weigh as an argument against the careful use of the seton. Even if sepsis did occur in such a case, the danger of peritonitis must be remote, since the "peritonitis" in the sac of the hydrocele would almost certainly shut off the greater sac from infection?

* Cure can also, of course, be obtained, by the old tedious method of incising the hydrocele and causing it to granulate up from the bottom.