Two days before his discharge was due he was taken ill and admitted to the hospital of which I was in charge on February 5th, 1918. He was a tall, spare man, in poor condition; the temperature was 97° F. There was confluent eczema on forearms and hands, which was beginning to discharge, and some patches on front of chest, face, and neck. Three days later the ears and neck were covered with crusts, from under which pus was oozing; fomentations did not relieve the condition. On February 12th his condition was getting worse; the temperature was 99.8°; he was having daily bran baths. On February 16th the temperature had risen to 100.4°; he was now covered with eczema, the trunk, arms, thighs and neck, also the face in part, being crusted over; from beneath the crusts was exuding thick offensive pus. Up to this time the patient had been taking his food pretty well. Three days later he was feeling worse and taking food badly, although sleeping well. The temperature was 101° F.

He grew very weak and emaciated and the temperature kept up until March 2nd, when it dropped to 97.6°. On this day he felt very cold, but was otherwise comfortable. Large patches were becoming detached, and pus was still oozing from beneath the crusts; the stench was very bad. He was taking food fairly and sleeping pretty well. He developed some catarrhal bronchitis a few days later, but this cleared up after a week on ordinary expectorant treatment. The crusts were still coming away in large pieces, leaving a raw purulent surface.

On March 24th the hands and wrists were very swollen; the temperature was 100°; the eczema extended all over his trunk, back and front, and on every limb. Two days later the knees were very swollen, and the temperature rose to 101.2° on the following day. By April 6th he was worse, with severe pains in his left arm and both knees. He was treated with colchicum mixture; he was too weak to continue the baths. The suppuration had lessened considerably. The next day he was very low and wandering in his speech, but he improved on stimulants and aspirin and slept a little. By April 22nd he was very ill indeed; the respirations were irregular and shallow, almost Cheyne-Stokes in character. He rallied again after stimulation, and for the next few days there was nothing to note specially, although he was getting steadily weaker, and was like a living skeleton. His joints were still swollen, and he was in considerable pain; taking very little nourishment, and having but little sleep, in spite of hypnotics. On June 13th he was very collapsed and in an extremely critical condition, and the pulse was rapid and weak, and the motions blood-stained. June 15th saw him with a very bad colour, pulse weak and thready, and unable to take his food. He had not slept. Morphine induced a good sleep, though of short duration, but he took food better during the night, and was fairly comfortable. On June 17th the pulse was hardly perceptible. A simple soap enema, followed by a rectal saline containing *sp. vini gallici* 1 oz., was given and retained. Next day there was a slight improvement; he was sleeping and taking food better. Two days later there was a noticeable improvement, the patient was eating better and sleeping well. Saline and brandy were given every other day, after clearing the bowel with soap enema. By June 23rd he had markedly improved, was much stronger, and was bright and cheerful. The eczematous condition was rapidly clearing away, the swelling of the joints was lessening, although he still complained of considerable pain. Appetite was good and sleep sound. The leg pains were severe next day, but twenty-four hours later were much less and his general condition better. During the next fourteen days, excepting a slight rise of temperature on June 29th, accompanied by sharp pains in the limbs (the weather was very wet), he made steady progress. He was much stronger, eating and sleeping well, and was bright and cheerful. His skin was much improved, clean and healthy. He continued to gain in strength and weight. The salines had been continued every other day. On August 14th the patient got up for the first time for over four months. By this time the skin was practically clear, and the appetite, sleep, and general state entirely satisfactory. By the beginning of September he had remarkably improved, he was getting up on alternate days, the odd days being given for the salines and rest in bed.

Progress during the month was well maintained, the patient had been out in a bath chair several times, and by the end of the month he was able to stand and to walk a few yards, with support. From this time onwards convalescence was steady and uneventful; he was stronger every day and fattening visibly. The knee-joints were still much enlarged, but there was no pain. After a time he was discharged the service, owing to chronic gouty arthritis.

Some years ago it was noticed, during an epidemic of infantile diarrhoea in Paris, that certain infants suffering from eczematous conditions of the skin, while under the saline treatment for their diarrhoea, were much improved as regards their skin troubles. Remembering this, I was induced to try the effect of salines on my patient; the result shows very markedly the effect of saline on the metabolism. The patient was apparently past all help when this form of treatment was commenced, and the really extraordinary change which took place in a few days was deeply interesting and gratifying.

To the nursing staff who carried out my suggestions so carefully, to the R.A.M.C. orderly who never spared himself in time or trouble, I owe my best thanks, and to Colonel Kay my thanks are due for permission to publish this case.

AN UNUSUAL CASE OF HAEMORRHAGE FROM TONSILLECTOMY.

BY

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The following case presented the complication of obstinate haemorrhage to a degree which is, fortunately, unusual.

A girl, aged 13 years, was on April 9th, 1919, anaesthetized (CE₂), with the head extended over a sandbag, for the enucleation of submerged tonsils by dissection.

The left tonsil shelled out easily, quickly, and nearly bloodlessly. On the right side, as soon as the upper half of the tonsil had been separated from its bed, copious bleeding began. This welled up from the extreme depths of the fossa, from a point entirely concealed by the anterior pillar, and from about half-way up the fossa. In colour the blood was arterial; an inability to detect pulsation may have been due to the depth of the bleeding point. This was probably either the tonsillar branch of the facial artery, or a tributary of the pharyngeal venous plexus.

Artery forceps failed to control the bleeding. Wagner's clips failed to grip the posterior faucial pillar; perhaps this was due to spasm of the palato-pharyngeus, for the patient was by now only lightly anaesthetized, and with the pharynx constantly and rapidly refilling with blood it was both difficult and dangerous to keep her under. With a cleft-palate needle three sutures were passed through anterior and posterior pillars, and these were sewn together over a strip of ribbon gauze; this also failed to stop the bleeding, and with repeated spasm one stitch cut out. A Cullum's clamp was now tightly applied, with temporary success. In order that the patient might tolerate the clamp she was, after removal to bed, kept lightly under morphine.

Nine hours later CE₂ was again given and the Cullum's clamp gingerly removed. Bleeding was, if anything, more profuse than before. Swabs and artery forceps were again tried fruitlessly. Cullum's clamp was reapplied while the external carotid was tied at its origin; the clamp was then removed.

The possibility of an abnormal tonsillar blood supply was suspected for the following reasons:

1. The common carotid had a high bifurcation—slightly above the hyoid level—and no superior thyroid branch could be seen. It seemed, therefore, likely that other arterial abnormalities might coexist.

2. Occlusion of the external carotid checked the bleeding almost entirely, but, for the moment, not absolutely. For these reasons the possible existence of a tonsillar branch from the internal carotid was surmised; and, as a safeguard, a second ligature was left loose around the common carotid, to be tightened if necessary. The slight residual oozing, however, stopped entirely in a few minutes; and this loop around the common carotid was removed in twelve hours. The after-history is as follows:

The blood lost was not measured, but the patient retained 1½ pints of saline in the rectum and 2 pints more subcutaneously. No serum was given nor calcium salts. But as a precaution against delayed poisoning after two anaesthetics with a chloroform mixture, the patient was given sugar dissolved in milk. The mouth was constantly cleansed by alkaline swabs and the post-nasal space by a nasal douche. The right tonsil (of which the removal had never been completed) sloughed out piecemeal, doubtless as the result of cutting off its blood supply; and two weeks later both tonsillar fossae were clean and empty. There was found to be no albuminuria, nor any blood dyscrasia which could aggravate bleeding. Thus a count of haemoglobin, colour index, and white cells, and a differential count of the latter by Dr. Sanginetti, revealed only a simple secondary anaemia, which was the only obvious disability of the patient when she was sent to a convalescent home on the twenty-eighth day.

Commentary.

Branches of the descending palatine arteries, or other bleeding points in or near the faucial pillars, are relatively easy to identify and pick up with artery forceps. Bleeding from invisible points deeper in the fossa (the tonsillar branch of the facial, a branch from the dorsalis linguae artery, or a tributary of the pharyngeal venous plexus) of ordinary degree is usually stopped permanently by clips or ligaturing the faucial pillars. Cullum's clamps (or any other pattern which acts similarly) are easier to apply, and usually effective; but the control obtained is not always lasting. In this case, after the clamp had been on for nine hours, the bleeding recommenced still more freely on its removal. The fear of fatal sloughing contra-indicates leaving the clamp on for too long.

In the reporter's experience either stitches or Wagner's clips have succeeded invariably, except in this case, in

which the bleeding was so profuse that the accurate application of either of these was impossible. This case exemplifies a point of the utmost importance—that the complete removal of tonsils (in contradistinction to mere tonsillotomy) is not, as the general public are apt to think, a simple minor undertaking. It is an operation entailing the heavy responsibility which must attend any surgical procedure liable to dangerous complications.

Abstract of the Harbeian Lecture ON NERVES IN AMPUTATION STUMPS.

BY
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THE lecturer pointed out that the subject selected—nerves in amputation stumps—was the continuation in a special domain of the more general lecture (Arris and Gale) delivered at the Royal College of Surgeons.

Nerves, as contrasted with other structures, have, he said, the peculiar power of regenerating. They grow again so as to re-innervate, or neurotize, a part that has been de-innervated. In the case of amputations the de-innervated portion has been removed by operation, robbing the regeneration of its object. The result is that the growth is wild, and it invades every contiguous structure, such as bones, vessels, muscles, etc., like a malignant growth permeates them. The growth exhibits a pseudo-malignancy, and, by growing between the cells, defeats all methods devised to arrest the progress of regeneration. This is a fact well worth bearing in mind, and the memory of it may stop much waste of surgical energy and time.

1. The immediate pain consequent on an amputation is due to the injuries inflicted on the nerves at that operation. It passes away in a few days.

2. The early pain after an amputation is due to the ends of the nerves, if not cut short, taking part in the general repair of the wound. If the repair is infective there is an infective neuritis, such as was exhibited in the sections shown at the Royal Society of Medicine in April, 1918. If precautions are taken to cut the nerves short and close their open mouths in a simple way, as by the swing-door method, the interior of the nerves are not infected from the wounds.

The three practical points arising from this are:

1. Cut short the divided nerves.
2. Close the mouths of divided nerves.
3. Avoid all wound infection, such as by avoiding handling and manipulation, which are the great causes of low-grade infections such as are not necessarily suppurative.

The healing of a wound by first intention in clinical work does not preclude the presence within it of low-grade infection. Nerve anastomoses mean much manipulation and are therefore banned. The swing-door method¹ is the best and simplest method. Nothing is left behind in the wound which has been touched.

The causation of remote pain is more complex. Three factors are now known:

1. Infective inflammation and its results, islands of fibrous tissue, within the nerve. Cultures have been obtained from nerve endings three years after complete healing of the wound. The organisms were shown by Professor Marinesco at the meeting of the Royal Society of Medicine in April, 1918.

2. The presence of foreign bodies, much insisted upon by Professor Marinesco. This includes metal, silk, and, if the words "foreign bodies" are given a large sense, all material such as fibrous tissue in the interior of a nerve ending.

3. The mental factor, due largely to illness, prolonged hospital stay, lost jobs, inability to take up new ways and interests, etc. It is a very large factor, probably larger in people who have lost limbs than in others.

There may be still more factors, such as that due to vessels trying to expand or contract in tissues permeated by fibrous tissue, but at present their clinical importance is unknown.

Three items of practical value stand out in this:

1. Do not use silk in infective wounds.
2. Do not keep men herded together in homes and hospitals longer than necessary.
3. Get them back to some kind of work, which will absorb their attention and take it off their condition, as soon as possible.

Under the saw-divided end of the bone there is and must be a "dead space" which gets filled with such scar tissue as is formed by the repair of the deeper parts of the wound. If this heals quickly and well, there are very few organisms in this internal scar. If, however, there is deep suppuration, the "dead space" is filled with irritant infective scar tissue. This irritates the bone, causing new bone formation; irritates the muscles causing their reattachment; and gives rise to pains in the stump which cannot bear pressure, slowness in healing with local oedema, and inability to encapsulate surely foreign material (silk and iron). This infective scar tissue is slowly sterilized by the fluids of the body, but if it remains irritant the new nerves formed by regeneration grow into it and the equation of nerve plus inflammatory focus equals pain becomes satisfied.² It was also suggested that sensations, perhaps short of pain but responsible for phantom limbs, might result if a new ill protected nerve fibre came in contact with a focus of repair. Reference was made to such a man who had a well marked focus of repair on the internal saphenous nerve in his Hunter's canal. When this was removed he recovered slowly. Be this as it may, the clinical fact remains unaltered that operation often fails to relieve such pains immediately. Such is to be expected. The very operation itself will lead to repairs in nerves amongst other structures, and the patient will have stored up memories of past operations, pains, and phantoms. With such a combination any hope of immediate cure is futile, but operation often causes some alteration, as in the phantom which has become immovable, then there is hope.

Slides demonstrating the quasi-malignant invasion of nerves into a tendon, an infected clot, in nerve coats, muscles, capillaries, arteries and bone, were shown.

The branching and anastomoses of the new nerves must lead to many complicated stimuli arriving at the brain for interpretation. This must lead to frequent variations in the quality and quantity of the sensations and symptoms so produced.

The very great difficulty which the nerve encountered when trying to progress through actively proliferating scar tissue was shown by the nerve spirals and the button-shaped nerve ends. The latter was an exaggeration of the former, the nerve filament having yet greater difficulty in advancing. This teaches a very practical lesson in nerve suture. The ends of the nerves must be so approximated that little scar tissue can be formed for the nerves to grow through. Apparently the nerves grow easily through muscle, but they make little headway through connective tissue. The scar in the skin gets innervated by the regeneration of the nerves. This was shown beautifully in a preparation made by Professor Marinesco.

In conclusion, it was said that the great cause of pain was inflammation, and the causation of phantoms was found in the mind and possibly in the association of foci of repair with nerves.

REFERENCES.

¹ *Proc. Roy. Soc. Med.*, April, 1918. ² *BRITISH MEDICAL JOURNAL*, June 15th, 1918.

At the first meeting of the Zinc and Spelter Joint Industrial Council held at the London Chamber of Commerce on May 13th, Dr. T. M. Legge, Medical Inspector of Factories, Home Office, informed the committee that there had been a decided reduction in the number of cases of lead poisoning and Bright's disease owing to the great structural improvements in the various works. The decline, however, was smaller than it was hoped for, and he invited both sides in the industry to co-operate in reducing the causes of these diseases. Statistics showed that they were almost entirely caused by the dust and fumes given off during the process of smelting.