and supinator longus muscles, and the wound was closed. Two months later faradic response and voluntary power were regained in the paralysed muscles. The recovery was neither hastened nor retarded by the operation, in all probability, but the response to the test rendered further exposure unnecessary, and made the prognosis as to recovery favourable.

Testing is sometimes of use in another way when operating on cases in which there is much scar tissue and the anatomical relations of parts are disarranged. Any nerve or branch can be stimulated and defined with certainty by noticing the muscle or muscle groups which contract on such stimulation.

The Apparatus.

The apparatus required consists of (1) a faradic coil and metronome, and (2) electrodes and connecting cords which can be sterilized by boiling.

The only essential of the coil is that it shall yield a sufficiently weak current. The coil we use yields a current so weak that it can only just be appreciated when both electrodes are placed on the tongue. If the current is strong, the overflow to the muscles other than those which are being tested causes general contractions, and renders accurate observation impossible. This difficulty is commonly met with.

The metronome interrupter is the simplest method to adopt in testing. The metal probe is held in contact with the nerve, and at each beat of the metronome the electrical circuit is made or broken. The testing electrode has not to be moved, and an accurate observation is easily made.

The testing electrode, a long metal probe with a terminal at the end for the attachment of the connecting wires, is far simpler than the type sometimes employed, consisting of two platinum wires insulated in a glass handle. These bipolar electrodes are easily broken—for example, in boiling—and, moreover, great care has to be exercised that both points, which are close together, are making contact with the nerve at the same time. The metal probe electrode is absolutely simple, cannot get out of order, and there is no difficulty in being sure that it is making contact with the nerve.

The cords and connexions are all sterilizable by boiling. There is no need, therefore, to wrap them in towels and so waste time during the operation, and there is no risk of infecting the wound. The connecting cords can lie on the sterilized towels by which the field of operation is shut off without risk.

The secondary electrode necessary to complete the circuit is attached to any convenient part well clear of the site of operation. In testing the nerves of the arm, for example, it is attached to the foot.

Method of Application.

The nerve is isolated and the field of operation rendered dry by swabbing. A glass rod is passed under the nerve and the metal probe is placed in contact with the nerve. The core is fully withdrawn, one cell actuates the battery, and one layer of secondary is used (the studs for these adjustments are clearly marked on the coil), and the metronome is started. A normal nerve will be stimulated by this weak current, and the muscles supplied by it will contract at each beat of the metronome. If there is no contraction the current is strengthened by pushing in the core, and if further strength of stimulus is necessary by using two layers. Any current stronger than this is unnecessary, and will simply cause contractions in the surrounding normal muscles by leakage along the nerve sheath.

With the equipment advised and a nurse or assistant told off to work the metronome and turn on and off as directed, the testing takes only a minute or two.

As a point of interest and as showing how weak a stimulus is used the following fact may be noted: In stimulating the median nerve exposed in the arm, the muscles put into action vary according to the exact part of the circumference of the nerve which is stimulated. Thus the pronator radii teres or the flexors of the wrist, or the long flexors of the thumb and index finger can be made to react as practically pure and uncomplicated actions.

Incomplete Lesion.

In healing with incomplete or partial division of a peripheral nerve it is sometimes necessary to suture part

of the nerve and to leave other fibres intact. An exact estimate of the extent of the paralysis is of value. Incomplete lesions are not uncommon in the cords of the brachial plexus, and are frequent in the sciatic.

Pte. J.; simple fracture of femur at the junction of the middle and lower thirds, complicated by complete paralysis of the muscles supplied by the external popliteal nerve and weakness of those supplied by the internal popliteal.

On exploration it was found that the lesion was situated at the entrance to the popliteal space and that the sciatic was not divided but existed as one trunk.

Faradic stimulation both at and above this point yielded no contraction in the external popliteal supply. By dissection the external popliteal element was freed and found to be totally divided, whilst a marked thickening of the sheath, in which were embedded fragments of bone, caused a thickened lump in the internal. This was all dissected off, and the nerve was again stimulated. As it responded it was proved that no damage had been done to the conducting power of the nerve during this extensive cleaning of the sheath.

Complete Lesions without Anatomical Division.

In such a case as the following the absence of faradic response, together with the length of history, indicated the necessity for exsection and suture.

Pte. G.; gunshot wound of forearm, lower third, with paralysis of ulnar, intrinsic of the hand, and loss of sensation in the ulnar area. Exploration four months after the injury.

The ulnar nerve was exposed and found in anatomical continuity, but with a small hard nodule, the size of a pea, in the substance of the nerve. No faradic response was obtained by stimulation of the nerve trunk above the lesion. The nodule, which occupied the entire thickness of the ulna, was excised and end-to-end suture performed. Macroscopically there was no evidence of nerve fibres in the excised nodule.

EYE CHANGES IN TRENCH NEPHRITIS.

BY

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DURING the spring of 1917 I had the opportunity, while on duty at Malta, of examining a series of cases of trench nephritis, or what is probably the more correct term, war nephritis. They were seventy or eighty in number, and all came in the same convoy from the Macedonian front. They were chiefly young active soldiers between 20 and 30, though they were a few older men among them. The history was generally the usual one of fairly severe exposure and strain, though not necessarily in the front line. Nearly all the cases presented the disease in a severely acute form, and on their admission were mostly seriously ill. At that time the fundi of a large number were examined, either by myself or by my colleague, Dr. Moffett. We found almost invariably marked retinal congestion, with large pulsating veins. There were no signs then, however, of any patches of exudation or nerve involvement. Some weeks later, however, on the examination of one or two patients who had complained of eye symptoms, we found present the more definite changes of nerve swelling, accompanied by patches of retinal exudation. We then decided to examine the whole series again, and by degrees this was done, with the following result. To make the points clear the cases may roughly be classified at the time of this examination (somewhere about three months from the onset of their illness) into three groups, A, B, and C.

Group A numbered about 21. They were all convalescent, presenting practically no symptoms except slight anaemia and debility. The urine was free from albumin, except for a very slight trace in a few. In only four of this class were retinal changes found, and they were slight in amount—a few small spots of exudation, a small punctate haemorrhage, a slight haziness of the disc edges, or a little oedema along the course of the veins.

Group B—a series of 20 cases who had not done so well as the others. Albumin was generally present, though in small quantity. There was breathlessness and slight oedema often. Of these cases, 8 showed minor retinal changes, with small exudation spots. One, however, showed much more marked changes, pointing to a fairly severe neuro-retinitis.

Group C, 13 in number, were severe cases in which the disease was still marked. They were suffering from

general symptoms, severe oedema with often a large quantity of albumin in the urine and sometimes blood. Of these 13, 4 showed very definite retinal changes and 4 changes of a slighter nature.

As far as could be ascertained, there were no signs of any other complicating disease, with the exception that several cases showed malarial infection. In none was there any history of previous kidney attacks. In 9 of the cases presenting the more severe retinal changes a Wassermann test was done, and in all of the 9 the result was negative.

Some points in regard to the fundus changes are:

1. That while the spots of exudation were generally in the usual situations—that is, near the disc and in the macular area—in no case was seen the typical silvery star-like figure of the chronic cases as figured in the textbooks.

2. Haemorrhage was not common. Those seen were of the small punctate variety, and not of the striate or flame-like character.

3. The optic disc was often affected, the changes varying from a definite swelling to slight wooliness and indistinct edges.

4. Small areas of oedema were noticed, especially along the course of the veins.

5. An important point was that in several of the series I was able to trace the gradual absorption of some of the smaller patches of exudation, and the healing process was very interesting to watch.

Summary.

To sum up the matter, I would say:

1. That in this disease the retina is very liable to be involved, although gross changes are not evident in the early stages, and latterly changes which had been present may have become absorbed.

2. That the pathology is probably an acute congestion resulting from some specific toxin, that the exudation which ensues is partly lymphoid and partly cellular in nature, and that this deposit probably clears up in the great majority of cases, without leaving any permanent results.

3. That the retinal changes do not affect the prognosis, except in so far that the severer these changes the severer the cases, in many instances, though by no means necessarily so.

4. That the condition is one which is probably allied to the acute retinitis of pregnancy, scarlatina, and acute uracmia, and should not be confounded with the retinitis of chronic kidney inflammation with its permanent changes in the retinal circulation vessels and tissues.

I have to thank my colleague, Dr. Elizabeth Moffett, for her help and assistance, and also the C.O. of Valletta Military Hospital, Lieut.-Colonel Slaughter, R.A.M.C., for his kind permission to publish these notes.

SYCOSIS AND OTHER CHRONIC STAPHYLOCOCCAL INFECTIONS OF THE SKIN, AND THEIR PREVENTION.

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At the present time considerable numbers of able-bodied men become invalided on account of chronic staphylococcal infections of the skin. These infections include: (1) Sycosis menti, and similar affections of other hairy parts, namely, the upper lip, the eyebrows, the eyelashes, the scalp, and the pubes and axillae; (2) chronic furunculosis; (3) chronic eczematized impetigo of the trunk and extremities.

The majority, probably all, of these cases could be avoided were the initial skin complaint correctly diagnosed and efficiently treated.

These staphylococcal infections may be all included under one term—impetigo of Bockhart; and an important fact not generally recognized is that they always, or nearly always, arise as a secondary complication of another form of impetigo—impetigo contagiosa of Tilbury Fox—an affection which is comparatively easy to cure.

The distinctions between the two groups of impetigo—first clearly demonstrated by Sabouraud in 1900—are not

even yet sufficiently known, probably because they are not pointed out, or not pointed out sufficiently clearly, in textbooks devoted to diseases of the skin. The distinctive characters of these two kinds of impetigo may be summarized as follows:

Impetigo Contagiosa of Tilbury Fox.

This is a highly contagious skin complaint due to the *Streptococcus pyogenes*. The characteristic lesions are the amber-coloured stuck-on crusts, which are formed by the dried-up serum of vesicles or blisters. In other words, the lesion resulting from streptococcal invasion of the surface of the skin is a superficial blister, which contains clear serum, which so rapidly dries into a crust that the early vesicle is usually unobserved. If, however, we remove the crust with forceps, we see a superficial erosion, with an overhanging fringe of the horny layer of the epidermis, which has exactly the appearance of, and indeed is, the floor of a broken blister.

This streptococcal impetigo contagiosa is of very common occurrence among children of the poor in the form of a crusted eruption upon the face or scalp. It is seen sometimes, too, as an epidemic among public school boys as what is known as "scrum-pox." It not infrequently attacks the chin and cheeks of male adults as a result of infection while being shaved. It occurs also on the limbs and trunk as a complication of scabies. In soldiers it is seen particularly in these two latter forms, on the head and cheeks or upper lip, as a result of a visit to the barber, and on the limbs and trunk and sometimes the face, in association with scabies.

It is from these two generally easily cured forms of impetigo contagiosa that arise most of the incurable staphylococcal infections—sycosis, furunculosis, and chronic impetigo—which may be grouped together as impetigo of Bockhart.

Impetigo of Bockhart.

This is a staphylococcal infection of the hair follicles which results in the formation of perifollicular pustules. The pustules may be small and closely set on some hairy region, as in sycosis menti, or they may be larger, and scattered over the trunk and limbs, as in furunculosis. In contrast with the superficial vesicular lesion of impetigo contagiosa, that of impetigo of Bockhart is a deeply seated pustule. The streptococcal invasion leads to a superficial serous exudation; the staphylococcal infection to an exudation of polymuclear leucocytes or pus cells, deeply in the tissues round a hair follicle.

Treatment of Streptococcal Impetigo.

In spite of the often formidable appearance of a streptococcal impetigo and of its tendency to spread rapidly, it is, on account of its superficial character, generally very easily cured by appropriate treatment. The staphylococcal impetigo, on the other hand, because of the deeply seated infection, is much more difficult to deal with, and many cases of long standing seem to be practically incurable. Herein, then, lies the importance of the early diagnosis and cure of impetigo contagiosa, since, as has already been said, nearly all, if not all, cases of incurable, or difficultly curable staphylococcal infections of the skin arise as a complication of uncured impetigo contagiosa. The usual sequence of events in these circumstances is as follows: A man gets a simple impetigo contagiosa of the chin and cheeks—superficial, amber-coloured, stuck-on crusts, which rapidly increase in number and extent. The eruption is perhaps diagnosed as eczema, or it is correctly diagnosed but not treated in exactly the right way, and as a consequence the eruption persists, and the vesicles and the crusted erosions become secondarily invaded by staphylococcus. The staphylococcus, once established, invades the hair follicles, and little follicular papules and pustules begin to appear. Soon the whole beard region becomes involved, so that every hair follicle is the site of a papulo-pustule, though the discharge from the conglomerated papulo-pustules often dries as a crust, which covers the chin and masks the follicular nature of the eruption. The condition is then that of sycosis menti, a most obstinate affection to deal with. The man remains under treatment in hospital for months, sometimes years, and has treatments by ointments, by vaccines, and by x rays. But the sycosis remains uncured.