the risk of infection is minimized. Especially there is no manipulation of the main tumour whilst the axilla is being dissected. An easy view is provided of the posterior aspect of the tumour, and complete knowledge obtained of the satisfactory distance of the posterior surface of the tumour from the line of cleavage.

I may add that after operation I always keep the arm at right angles to the trunk—in other words, extended in a line with the shoulder. I have known one or two cases begin doing their own hair as early as ten days after operation. I beg, therefore, to submit the contrast I have drawn between these two operations for discussion by the meeting. Personally, I have full confidence that my preference for the more modern operation will find acceptance, but I trust some of those present will be found to point out advantages of the former and defects in the latter operation which have escaped my notice, but which I presume present themselves to the minds of those who practise it. This is intended to be merely a short paper. I have therefore avoided any reference to the larger operations involving division of the clavicle or dissections down the abdomen.

GONORRHOEA TREATED BY ELECTROLYSIS:

RESULTS IN 500 CASES.

BY

CHARLES RUSS, M.B.LOND., M.R.C.S.

IN 1915 I published a description of this process and gave a brief account of the results in the earliest stages. Since then several monographs have appeared showing the improvements attained. The outstanding feature of the method, as evolved to-day is, I think, the rarity for any case to become chronic; particularly is this the case when the subject is one who has attended early and has not already had one or more attacks. Not the least satisfactory feature of the method is the facility with which one can deal with the disease in women on the same principles, but of course with a modified technique. The process as I use it is as follows:

In an acute case, in a man, the first step is to make a smear preparation of the discharge and stain it by Gram's method. The existence of gonococci will be established by this means, but if they are not seen there can be no positive diagnosis of gonorrhoea. By the microscope one also detects in this way the existence of those cases, which are quite uncommon, of a primary urethritis with a purulent discharge for which some other bacteria are responsible. These latter cases also differ clinically as to the latent period between the contact and the appearance of the discharge and in other signs.

The patient is first directed to void some but not all of the urine; he then reclines on the couch. In the acute stage a few drops of stovaine solution are injected into the anterior urethra. Having thus dulled the sensitiveness of the channel, the perforated electrolysis catheter is gently passed into the urethra as far as the compressor muscle. This will be found a painless proceeding. The flexible indifferent electrode containing metallic gauze covered by several layers of lint is wrung out with warm water and applied to the scrotum, and also around the penis. The positive electrode is connected to the stylet of the catheter, and the negative electrode is connected to the pad. The fluid used is a solution of sodium chloride, 1 per cent., containing also one-half per cent. monochloroacetic acid. This fluid fills the catheter, and also the funnel of india-rubber which is attached to its upper end. As the fluid is absorbed to some extent by the urethra, and also decomposed by the current, the excess in the funnel maintains the provision of the fluid path for the current, which is also chemically balanced as the electrolytic action progresses. I mean that the monochloroacetic acid is less decomposed by the current than the salt, and this acid is able to neutralize the alkalinity which the liberated sodium would otherwise deposit against the urethral membrane, and which would cause pain and injury to the delicate epithelium.

A current of three-quarters to one milliampère is all that need be given, for half an hour each day for the first five days. After that I treat the case only every other day, and on the average twelve treatments in all are enough.

Beginning this work in 1912 I have tried most of the variations of the large currents (up to five milliamperes). I have tried the effect of giving treatment several times a day and other variations, but I find the best results so far are as above mentioned. The clinical improvement is not due alone to a germicidal effect on the gonococci, though this is considerable. There is also a vasocongestion following any electrolysis, and if too strong or too frequent a current is used there may be haemorrhage following from the engorged vessels.

After six treatments of this kind there will be very little discharge, and of course no other treatment, such as lavage or irrigations, must be used. At the end of the first week the patient takes 5 minims of sandalwood oil in capsule form four times daily. This can be gradually increased to twice that amount in the twenty-four hours. A weekly dose of gonococcal vaccine is also a routine which helps the vital factor of phagocytosis. Starting with small doses of 10 million a safe increase is that of a like amount each week. Gonococcal vaccine alone is quite unable to overcome the suppurative process.

As the discharge ceases the threads are the only remaining sign of the malady; these become less purulent and are soon only wisps of mucus, in which presently no gonococci can be found. When the patient has seen no discharge for two weeks and is having no treatment by electricity, nor in the form of medicine, the tests can be undertaken. If gonococci are not found microscopically a dose of 200 million gonococcal vaccine is injected. If the infection has not been abolished there will be an angry redness of the injection site and the re-establishment of a urethral discharge of a purulent character, in which gonococci will be seen easily. Favourably there are neither of these signs. At the same time the patient can resume the use of alcohol, which has been avoided since the onset of the malady. Alcohol, being a mild urinary irritant, is sometimes able to reinforce a slight urethral discharge, which the patient may have missed, but it is, of course, unable to generate gonococci or other bacteria which were not there all the time. Electrolysis practised in this way is a painless, safe, and rapid way of overcoming acute gonorrhoea. It is, of course, a much more elaborate form of treatment than using a syringe or irrigator, and gives much more reliable results.

Complications.

I have already referred in previous monographs to the remarkable immunity from arthritis and fascial complications of patients treated in this way. In the whole series I have only encountered two cases, and in one of these a peri-urethral abscess had been incised before I saw the case. The act of incision (a correct procedure) had provided the inoculation of the gonococci into the lymph stream. In the other case the condition was reported to me after the patient had come under the care of another doctor for a sharp fever attack coincident with his gonorrhoea, but I did not have the opportunity of seeing the joint or distinguishing the condition from an influenzal or other arthritis. Without, however, labelling these cases, the percentage is too remarkably small to be accidental. It is clear that the process of electrolysis for gonorrhoea makes arthritis so unlikely an occurrence as almost to justify the assurance of immunity. When one realizes the serious disability that patients may suffer from the crippling effects of gonorrhoea this is a consideration of the first order of importance.

In this series I had no cases of ophthalmia, nor did any cases of stricture occur. The absence of stricture is not surprising, considering the rarity with which cases become chronic. For an organic stricture to form there has previously been a necrotic phase of the suppuration leading to an ulceration. The subsequent fibrosis of the ulcer leads, of course, to the constriction of the urethral lumen and its symptoms. It is probable that the use of strong and caustic chemicals, either as bougies or as instillations, in the delicate urethral lining produces the initial chemical lesion which initiates the ulcer formation. Spasmodic stricture one sees, of course, occasionally, but as this is essentially of the nature of an inflammatory spasm it needs nothing more than sedative treatment, to which it always yields.

Epididymitis is the one liability of gonorrhoea in men which I have encountered; this condition is, of course, met with in patients in whom none but expectant or

purgative treatment is followed, while it also occurs in the routine methods of injections or irrigations. Not infrequently a new case appears for treatment with epididymitis as the first symptom of any malady that the patient has apparently noticed. This complication is the one which makes the period before recovery much longer. In my last series of cases the frequency of its occurrence has fallen considerably. In my experience epididymitis is unlikely to occur except in the acute or subacute stages.

Number of Treatments.

In the absence of any complications twelve treatments are needed in an acute case. This means that electrical treatment is not required after the third week. By a survey of the last five years of this work this period has been getting shorter, and the present is not likely to spell finality. In this series of 500 cases 287 were acute and 213 chronic. The chronic cases were usually sent to me after not less than two months of treatment under the care of the patient's medical man. Either irrigation or injections had given some relief but had not arrested the disease, or there had been a relapse after ceasing treatment. In such cases there needs to be microscopic examination as to the presence or not of gonococci. By this means one knows whether the condition is one of gleet.

For the reasons already given there should not be too frequent use of electrolysis in these cases. In spite of local lavage that has been tried in the methods mentioned, and perhaps vaccine and medicines, there still is a suppurative condition. The patient's resistance is weak, and if continued with no perceptible improvement one sees too often how irrigation leads to irritation. Electrolysis three times weekly, with no other local treatment, soon produces the desired change, and so far I have not met the case which will not yield to careful assistance given this way provided the patient co-operates in the programme laid down. Sometimes the patient's failure to recover under his doctor's care is due to the patient's own impatience or to indulgences of the alcoholic or other types. Sometimes also he has been disappointed by the unrealized promises of recovery within a period. The promise of recovery in a certain time is, of course, a factor in the patient's confidence at the beginning. I think, however, with the late Dr. Gee, that in most maladies prognosis is the most difficult of the informations expected of us. But as that great teacher used to remind his students, "Gentlemen, you will usually be wrong."

In view of the immunity from rheumatic complications described, I believe the protection is due to the production of a specific antibody, probably allied chemically to gonococcal vaccine. If so, the vaccine I am making in a special way may, by itself, prove of greater value than existing forms, but I have not yet sufficient experience of it to make a detailed publication at the present stage. In curing gonorrhoea we are not able by any single operation to empty the mucous glands and follicles of the urethra of the infecting bacteria. A stream of liquid injected or irrigated does something in that direction, but if it could wash out the gonococci in those crypts we could remove them while the patient waits, so to speak. Manifestly we can no more do that than we can wash the infecting microbe out of the parotid gland (in a case of mumps) by irrigations through its duct. Treatment of gonorrhoea does, of course, assist recovery, and it does so by local germicidal action, by elevation of the resistance by the appropriate vaccine, and by the bactericidal action of urinary antiseptics. A good treatment therefore must avoid washing away the precious antibodies which are in the lymph-bathed but inflamed parts, and at the same time it should help by destroying or otherwise removing from the affected channels the populations of the gonococci, whether dead or alive.

ACCORDING to recent statistics Vienna has lost 10 per cent. of its population since 1910, or 190,000 inhabitants, 130,000 of whom were children or adolescents.

PROFESSOR EMILE JEANBRAU has been appointed the first professor of urology at the school of medicine at Montpellier. He was president of the twenty-first congress of the French Association of Urology recently held at Strasbourg.

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THE TREATMENT OF NEGLECTED CASES OF CLUB-FOOT.*

BY

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THE commonest deformity resulting from infantile paralysis is club-foot, the variety known as talipes equino-varus being the most frequent. This condition, as time elapses, becomes more pronounced, and, unless appropriate means are adopted in its early stage to correct the deformity, very radical procedures are necessary for its amelioration.

During the last four years I have had several cases of the different varieties of club-foot under my care which have not had efficient treatment, some of them having been entirely neglected. Their ages have varied from 7 years up to the twenties when first brought under observation. They have comprised cases of talipes equino-varus (paralytic and spastic varieties), talipes equino-valgus, talipes calcaneo cavus, and talipes plantaris.

As pointed out by Rowlands,¹ it is useless to expect that in the later stages tenotomies, with division of contracted ligaments and fascia, will alone rectify the deformity. The bones of the foot have grown and developed in an abnormal position, and it is this abnormal growth of the bones which proves an effective obstacle to the restoration of the foot to a normal shape. Rowlands advocates an operation through the medio-tarsal joint, which is tantamount to an excision of this joint. I have followed closely on the same lines.

Talipes Equino-varus.

This deformity, when well developed, presents the following points of interest:

The affected limb is shorter than its fellow; there is wasting, which may be very marked; the leg feels cold, presents a bluish discoloration; the heel is raised from the ground; the foot is inverted and adducted. The head of the astragalus forms a marked projection on the dorsum of the foot. There is some degree of scoliosis (compensatory), which disappears on the patient being held up. The gait is awkward, the patient walking on the outer border of the foot, and where this comes in contact with the ground a callosity develops. There may, in addition, be some degree of rotation inwards of the lower part of the leg.

FIG. 1.—Talipes equino-varus.

Treatment.—Following the example of Sir Robert Jones, the operation is bloodless. After elevation of the limb a tourniquet is applied around the thigh so as to compress the femoral artery. Though numerous vessels are severed, there is no bleeding to obscure the field of operation, and consequently no time is taken up in tying vessels or swabbing the wound.

The plantar fascia is put on the stretch, the tense bands being divided subcutaneously. The inferior and internal portions of the astragalo-scapoid capsule and the long and short plantar ligaments are then divided. The foot is unrolled and stretched manually as much as possible. A curved incision is then made from below and in front of the internal malleolus, downwards and outwards over the dorsum of the foot towards its outer border. This incision is planned so as to open later the medio-tarsal joint, which latter is made up posteriorly of the head of the astragalus and fore part of the os calcis, articulating respectively with the scaphoid and cuboid anteriorly, each joint having a synovial cavity and being surrounded by a strong ligamentous capsule.

The incision is deepened, cutaneous nerves and veins are cut through and then the anterior annular ligament of the ankle-joint is divided. The following tendons are exposed from within outwards: the tibialis anticus, extensor longus hallucis, extensor longus digitorum, and the peroneus tertius. These are freed and lifted forwards by means of a couple of hooks. The termination of the

* Read before the York Medical Society, December 10th, 1921.