AN ESSENTIAL PRINCIPLE IN THE TREATMENT OF GAS GANGRENE.

BY TEMPORARY COLONEL H. M. W. GRAY, C.B.,
M.B.ABERD., F.R.C.S. EDIN.,
CONSULTANT SURGEON, BRITISH EXPEDITIONARY FORCE.

I wish to urge the wide recognition and application of a principle which I believe is essential for the successful prevention and eradication of gas gangrene in war wounds met with in France. My reason for doing so is that I have not seen it definitely mentioned in any writings in the public press. I have recommended it for the past two and a half years, and it becomes daily more evident that the principle is correct.

The causative bacilli of gas gangrene will not develop in tissues which are provided with a vigorous circulation of healthy blood. They thrive best when the circulation is entirely stopped—for example, in a person dead of gas gangrene or in a limb of a living person where the main vessels have been severed. Long application of a tourniquet often allows the infection to obtain a firm hold. The absence of circulation in the wounded part, whether from a general cause, such as shock, or from a local cause, such as tension from effused material or pressure of foreign bodies, favours its development. As Major-General Cuthbert Wallace and others have pointed out, these bacilli grow most luxuriantly in devitalized muscle. The injured muscle or group of muscles is deprived, in part or in whole, of its normal blood supply according to whether the missile severs the main nutrient vessels or merely causes isolation of lacerated portions. Pressure in the neighbouring parts, whether caused by effused material in the wound, by inflammatory reaction, or by external constriction, interferes still further with the circulation, and forms a most important arc of the ever-widening vicious circle of spreading inflammation.

From purely clinical observations, then, the principle has been evolved, and it is this: Whether one undertakes preventive, pre-inflammatory operation, or curative operation after the gangrene has developed, success and safety are assured only when the wounded parts are excised until definite bleeding of the cut surface is seen. The bleeding must be definite; it need not be free. In pre-inflammatory operations the use of a tourniquet during operation may be permissible; it is not advisable unless the patient is exsanguinate. In cases where gangrene is already well marked it should not be used. Care must be taken that in excising parts at the later stages of the operation the blood supply of tissues left behind at an earlier part of the operation is not interfered with; therefore, as a rule, proximal parts should be excised before distal parts. It is usually easy to decide, when this principle is kept in view, how much should be excised—whether only part of a muscle, the whole muscle, a group of muscles, or the limb.

Surgeons who base their work on this principle have more success, and have to perform fewer secondary operations than those who do not follow it.

On the successful application of the principle I have enunciated depends the justification of the practice of excision and primary suture of wounds—a procedure which I carried out with gratifying results as far back as November, 1914.¹

REFERENCE.

¹ BRITISH MEDICAL JOURNAL, August 28th, 1915.

A CASE OF PYAEMIA TREATED WITH INTRAVENOUS INJECTIONS OF EUSOL.

By ROBERT AITKEN, M.D., M.R.C.P.E.,
TEMPORARY SURGEON R.N.

In my opinion there can be no doubt that the intravenous use of eusol saved the life of the patient whose case is here recorded. He was exceedingly ill on the Wednesday when he was admitted, and I did not expect that he would see the end of that week. It was very noticeable how he improved after each injection of eusol, and I have pleasure in adding my testimony as to the value of that remedy.

William C., aged 20, a gunner in the R.G.A., was admitted to the R.N. hospital ship *Plassy* on October 18th, 1916. Ten days earlier he had had tonsillitis which soon cleared up. Four

days before admission he had become feverish again, and marked deafness was present in both ears.

His temperature was 103°, and he complained of pain in the left sterno-clavicular, left shoulder, left wrist, and right ankle joints; all of these were swollen and tender. He was very deaf. There was no pain or tenderness about the ears or mastoid region. The tonsils were slightly congested and enlarged, but he had no pain on swallowing. No other physical signs were made out.

The day after admission the joints were still very painful, and the patient was seriously ill. He was put on tincture of strophanthus and brandy, alternating every two hours. As he seemed to be suffering from a pyaemia he was given that evening an intravenous injection of eusol as recommended by Lorrain Smith¹ (80 c.cm.). The following morning his hearing had slightly improved, and he said that the pain in his joints was easier. Towards evening the pain got worse again, and I gave him another intravenous injection of 100 c.cm. of eusol. He had a fairly comfortable night, his temperature falling steadily for six hours after the injection to 100°, which was the lowest reached since admission. He complained, however, of pain over the right foot.

For the next three days he improved, requiring less assistance, and taking more notice of what was going on in the ward. As the right foot had become more painful and oedematous, an incision was made and the pus present evacuated, the wound being dressed with eusol. Staphylococci and a few streptococci were cultivated from the pus.

The temperature continued high, frequently being 103°, and on the evening of October 24th I gave him another 100 c.cm. of eusol intravenously. Half an hour later he had a rigor; the temperature rose to 105.8° and the pulse to 156. In two hours the temperature had fallen to 98.2° and the patient was feeling comfortable. The following morning there was a marked improvement. He could hear almost ordinary conversational tones from the other end of the bed. The temperature was 97°. The joints were no longer swollen and there was practically no pain or tenderness.

For the next few days he improved and was able to move himself without pain, but he was still very ill. The temperature had been remittent, but now became intermittent. In spite of the tendency of the temperature to fall, dullness began to be noticed on the left side of the chest, and its area increased. On October 30th his chest was aspirated and 105 fluid ounces of thin pea-soup-like fluid drawn off; this contained both staphylococci and streptococci. He was so ill, however, that I did not consider it advisable that he should be operated on to establish free drainage.

From this time he improved more rapidly, but a few days later his temperature began to rise again and the fluid showed signs of reaccumulating. Accordingly, on November 8th he was again aspirated and 64 fluid ounces of thick creamy pus withdrawn. It contained numerous short chains of streptococci. In view of the more definitely purulent nature of the fluid, it was decided to open the pleural cavity that evening; 25 fluid ounces of pus containing large flakes of lymph, came away. The operation, under local anaesthesia, was well borne. Though there was a copious discharge each time the wound was dressed, the patient's general condition continued to improve, his temperature becoming normal.

On November 10th he was discharged to a shore hospital, where convalescence was soon established, and his further progress was uneventful.

It was my opinion that the original infection came from the tonsils, and I advised him to have them removed. This was done later, and in July he wrote to me saying that his condition was quite satisfactory. Since then he has been passed as fit for general service.

REFERENCE.

¹ BRITISH MEDICAL JOURNAL, November 13th, 1915.

TREATMENT OF PSORIASIS IN THE ARMY.

By

H. W. BARBER, M.A., M.D., M.R.C.P.,
CAPTAIN R.A.M.C.(T.C.).

The importance of psoriasis as a cause of disability among troops is not great, but men with an extensive eruption require treatment. At the time of writing, out of 1,100 patients admitted to hospital for skin disease, 56 (that is, about 5 per cent.) are being treated for this complaint. In order to return these cases to duty as quickly as possible I have recently adopted the following method, which has afforded more rapid and uniform results than any other that I have yet tried.

1. Treatment of a Generalized Eruption on the Body and Limbs.

The patient attends for treatment twice daily. Every morning he is given a bath, to which on the first two days cresol (1 oz. to an ordinary sized bath) and an alkali

(a handful of sodium or potassium carbonate) are added; on subsequent mornings the cresol is omitted. After the morning bath, and again in the evening, the following ointment is applied to all affected parts from the neck downwards, excepting the genitals;

R Chrysarobin.	...	...	...	...	gr. 10
Acid. salicylic.	...	...	...	...	gr. 15
Acid. carbolic.	...	...	...	...	gr. 10
Zinc oxide	...	...	...	...	dr. 1½
Lanoline }	...	...	...	...	...
Vaseline }	...	...	...	...	...
	...	...	...	...	ss ad oz. 1

Throughout the period of treatment a suit of pyjamas is worn next the skin night and day, and thus becomes thoroughly impregnated with the ointment. The patient is inspected by the medical officer at least every second day.

As a rule the ointment is well tolerated, but, should any area of skin become acutely inflamed and tender, the application of the ointment to that part is at once discontinued, and, instead, some soothing preparation, such as Lassar's paste* (to which a little ichthyol may well be added), is kept thickly applied to the affected region. The genitals are throughout protected by Lassar's paste.

At the end of a week, sometimes earlier, the eruption in most cases is to a large extent cleared, whereupon Lassar's paste, containing 10 grains of salicylic acid to the ounce, is applied to the treated parts, to allay irritation and assist desquamation. A clean suit of pyjamas is at the same time issued to the patient, and at this stage a bath on alternate days only is given.

2. Treatment of Resistant Patches.

It will usually be found that a few active patches remain after the greater part of the eruption has disappeared. Such areas are commonly seen on the elbows and knees, wrists and hands, in the hollows just behind the great trochanters, and sometimes elsewhere. In the treatment of these a stronger ointment is employed as follows:

R Chrysarobin.	...	...	...	...	gr. 20
Acid. salicylic.	...	...	...	...	gr. 25
Acid. carbolic.	...	...	...	...	gr. 10
Zinc oxide	...	...	...	...	dr. 1½
Lanoline }	...	...	...	...	...
Vaseline }	...	...	...	...	...
	...	...	...	...	ss ad oz. 1

This is rubbed well into the patches twice daily, and is also kept applied to them on lint during the night, providing that the healthy skin immediately surrounding them is not actively inflamed.

3. Treatment of the Scalp and Forehead.

In order to prevent the occurrence of conjunctivitis the chrysarobin ointment is not used for these parts. The hair is cut very short, and the scalp shampooed three times a week. An ointment of the following composition is kept applied by means of lint, or, better, a closely-fitting linen cap:

R Acid. pyrogalllic.	...	...	...	...	gr. 10
Acid. salicylic.	...	...	...	...	gr. 15
Acid. carbolic.	...	...	...	...	gr. 10
Ung. hyd. ox. flav.	...	...	...	...	oz. 1

4. Treatment of the Face and Front of the Neck.

As a rule, psoriasis of these regions will yield to zinc ointment containing 10 grains of ammoniated mercury and 20 to 30 grains of salicylic acid. In more resistant cases the pyrogalllic acid ointment, as recommended for the scalp, has proved effectual.

5. Internal Treatment.

The external treatment described has up to the present been uniformly successful in clearing even the most extensive eruptions in a comparatively short time. Its object is to render a man fit for duty as quickly as possible; it will not, of course, prevent relapses.

Internal treatment is only adopted in certain cases. As regards diet, probably the most important factor to be considered in the prevention of relapses, it would in most instances seem hardly worth while to attempt to control it, seeing that the patients will return to active service conditions after their discharge from hospital. Florid individuals, however, with an inflamed eruption are kept for

a time on a milk diet, with plenty of fluids, and freely purged, and a mixture containing vinum antimoniale and potassium citrate is prescribed thrice daily. In another class of patient there is evidence of intoxication from some septic focus—frequently, apparently, the mouth. In these cases a thymol mouth-wash is directed to be used several times a day, the sockets of the teeth are cleansed with hydrogen peroxide, the bowels are kept well opened, and a mixture containing dilute hydrochloric acid and nuxvomica is given after meals. After their discharge they are recommended for dental treatment.

Contraindications and Modifications.

Very acute cases, and those in which the eruption is inflamed and angry-looking, should not be treated at once with the chrysarobin ointment. Free purgation and diuresis, a milk diet, and the administration of vinum antimoniale, together with the local application of Lassar's paste containing salicylic acid and ichthyol, form the lines along which treatment should first be directed. When the acuteness of the eruption has subsided the method of treatment already described may be cautiously begun.

No patient who is suffering from boils or other forms of pyoderma should begin the treatment until these have been cured; otherwise very acute dermatitis is apt to be provoked.

Psoriasis is not uncommonly seen in persons of the seborrhoeic diathesis, and impetiginized seborrhoeic eczema of the face, scalp, ears, and neck sometimes coexists with psoriasis of the trunk and limbs. In seborrhoeic subjects not only does the character of the psoriatic eruption differ from that usually seen, but the distribution is apt to be that of a seborrhoeic eczema—that is, the flexures and midline of the back and chest tend to be involved. As seborrhoeic subjects are peculiarly susceptible to all forms of external irritation the treatment of psoriasis in them must be carried out under very careful supervision in order to avoid chrysarobin dermatitis. The following alkaline citrate mixture is very useful in these cases: Sodium citrate gr. 30, potassium carbonate gr. 15, and sodium bicarbonate gr. 15, thrice daily one hour before meals.

CONCLUSIONS.

Although this method of treatment may not appear to differ materially from those usually employed, the fact remains that no other preparation I have ever used has given me nearly such rapid results. This, too, is the experience of my colleagues, all of whom are dermatologists. We are agreed that the carbolic acid, incorporated in the ointment, must have some specific effect. Whether its action is local, or whether it depends on absorption cannot be proved, but it is interesting to note that Kaposi considered that carbolic acid given internally was as effective as arsenic in the treatment of psoriasis. No ill effects have as yet been noted, but, of course, the possibility of renal irritation and carboloria must be considered. For this reason application of the ointment over a wide area must never be continued for longer than a week without a break; fortunately the eruption over the greater part of the body is usually cleared at the end of this period.

Apart from any special virtue of the applications used, I would lay great stress on the thorough supervision of the treatment as a factor in its success.

I wish to express my gratitude to Major MacCormac, R.A.M.C., who has kindly given me every facility for the carrying out of the treatment, and to my colleagues, Captains Semon, Small, Stewart-Smith, and Pellier, for providing me with cases.

ELECTRICAL TREATMENT OF MUSCLES IN "TRENCH FEET."

BY

FLEET SURGEON G. MURRAY LEVICK, R.N.(Ret.).

A NUMBER of cases of trench feet have been treated very successfully in the Electrical Department at Tooting Military Orthopaedic Hospital.

At first nearly all the patients were sent from the wards with a request for radiant heat treatment. After a short trial this was abandoned completely. Not only was it no use, but in nearly all cases the patients complained that it increased their pain instead of relieving it. As already

* The formula for compound zinc paste (B.P.C.) for which "Lassar's paste" is a synonym, is as follows: Zinc oxide finely sifted and starch in powder, of each 24 parts; salicylic acid in powder, 2 parts; soft paraffin (white) 50 parts. The salicylic acid may be omitted, but the name "Lassar's paste" is retained.