Case 30.—Pte. F. M.; admitted July 24th, 1917. Large shell wound of leg, with compound fracture of tibia and division of posterior tibial vessels and nerve; extensive laceration of muscles. Amputation. Wound clean for four days, then profuse purulent discharge. Carrel-Dakin treatment.

August 7th. Clean but huge open wound. Patient evacuated to base on August 12th.

Case 33.—Pte. S. W.; admitted July 25th, 1917. Shell wound of thigh, with compound fracture of femur and whole of back of thigh blown away. Extreme shock, contraindicating general anaesthetic other than nitrous oxide. No excision of wound; only pasting. The following day the wound was stinking, and the patient's condition prevented operative treatment.

July 29th. Death from shock and sepsis.

Case 43.—Pte. W. G.; admitted July 30th, 1917, with the following shell wounds: (1) Back, with fractured spine and paralysis of bladder; (2) head, penetrating brain. Primary suture of head.

August 7th. Wounds clean.

August 12th. Head wound healed; back wound clean. Pyuria.

August 16th. Death. Autopsy showed sepsis of whole urinary track. Wounds clean.

THE USE OF LIQUID PARAFFIN IN THE TREATMENT OF WAR WOUNDS.

BY

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DURING the past year much clinical observation has been carried out in several Casualty Clearing Stations in this Army on the effect of liquid paraffin upon wounds at different stages.

The results of these observations enable one to state:

1. That liquid paraffin has, almost without exception, a very beneficial action on the walls of a wound and on the tissues adjacent to the wound. It prevents development of the symptoms of inflammation in these parts and will cause such symptoms to disappear rapidly if they are already present. The skin remains or becomes normal in appearance; redness and swelling do not develop or, if present, disappear. Pain is assuaged. Performance of function becomes easier, although, of course, this is frequently restrained by therapeutic agencies and is therefore not evident. Changes of dressings are comparatively painless.

One does not care at this stage to discuss possible explanations of these effects of the paraffin, but it may be pointed out that the "electrical" conditions of wounds have usually hitherto been entirely disregarded, only chemical and mechanical conditions having been considered. Electrical conditions of wounds, as revealed by the galvanometer, are found to vary, in a very consistent way, with the age of the wound and the amount of inflammation present.

2. Liquid paraffin is not antiseptic in the ordinary sense of the term. If a wound be "packed" with gauze wrung loosely out of the paraffin, it is found that in two to four days the discharge in the wound swarms with organisms, although the surrounding parts are free from inflammation. The "wound" with the fluid part of its contents may be likened to a test tube containing nutritive medium in which organisms are thriving. In either case the addition of antiseptic will lessen or entirely inhibit the growth. If an antiseptic is dissolved or suspended in the liquid paraffin with which the gauze pack is saturated, it is found that the wound remains or becomes sterile. Various antiseptics or mixtures of antiseptics have been used, with good effects in all cases, although these effects vary, possibly owing to selective effect of the particular antiseptic against the particular organism or to tolerance acquired by the organisms for the antiseptic employed against them. Those chiefly used up to the present are flavine, brilliant green, boric acid, and iodoform. It is rather difficult to justify preference for any one. A combination seems desirable. Non-poisonous antiseptics with more or less prolonged action when in contact with body fluids are likely to be most successful. It seems that, although the effects of micro-organisms on the tissues adjacent to a wound are inhibited, absorption of chemical antiseptics from the wound may occur and cause symptoms of poisoning.

One would desire to draw attention to papers sent for publication by Captain W. H. Hey and others (p. 506),

which deal with clinical results obtained from the use of pastes made with liquid paraffin as a base. Captain Hey found that pastes made with other substances—for example, gums—are inferior in curative action to those made with paraffin. During his investigations Captain Hey did not regard the bases with which his various pastes were made up as being anything else than "neutral."

It has been stated that the paraffin in bipp paste delays healing. Delay in healing of recent wounds, as has been observed in "bipped" cases, has not occurred in paraffin pastes made up with antiseptics soluble in serum. It seems more likely that the excess of bismuth subnitrate and iodoform in bipp is responsible by preventing adhesion of apposed surfaces.

The only type of inflammation, in cases which are not already too far advanced to recover, which in my experience has not yielded to the free application of liquid paraffin is that exemplified in a wounded limb which becomes much swollen, brawny, grossly nodular, and brownish-red, the wound being covered with granulations which look like dirty pale pink frog's spawn.

In all cases it is essential for success to have thorough preliminary opening up and mechanical cleansing of the wound. A piece of half-dead muscle left behind, infected with gas bacilli, is not likely to become disinfected by antiseptics, especially when the patient's resisting powers are at a low ebb; the paraffin is likewise at a disadvantage because the affected tissues cannot react in the ordinary way. Gauze used for packing a wound smeared with a paraffin paste should be wrung out of liquid paraffin or iodoform-paraffin (1 per cent.), and the skin around the wound covered with similarly impregnated gauze. Captain Hey, Captain Short, Captain J. Anderson, and others have shown that wounds may be sutured with success at a very early stage after treatment by such methods.

REINFECTION IN SYPHILIS;

WITH OBSERVATIONS ON 28 CASES.

BY

CHARLES F. WHITE, MAJOR R.A.M.C.

PROBABLY, though it would be a question difficult to settle, there is no such thing as a natural immunity from syphilis. However this may be, it was held until recently that immunity from syphilis might be acquired. The older theory, now abandoned, was that one infection of syphilis produced immunity from further infection; in other words, that syphilis could be acquired once only in a lifetime. Careful investigation appears to establish—

1. That reinfection can take place.
2. That such reinfection cannot take place until the original infection has been completely cured.

With the older treatment of syphilis a complete cure was difficult, or very rare, and consequently cases of reinfection were so exceptional that a doubt of their existence was not unreasonable.

The collection and examination of instances of reinfection are therefore of great importance. First, as showing beyond doubt that reinfection is a fact, and, secondly, as amounting to almost complete proof of the cure of the first attack.

Since the introduction of the combined salvarsan and mercury treatment for syphilis the number of cases of genuine reinfections reported has increased—a sure sign of the curative efficacy of this treatment and a proof that one attack of syphilis does not produce immunity. Perhaps we should not be far wrong in saying that the only persons immune from syphilis are the syphilitics.

Formerly proof of reinfection was based on clinical evidence alone and was open to certain fallacies, namely:

(a) *In the Case of the First Attack.*—Absence of positive proof of syphilis in those cases in which treatment was started in the primary stage and in which secondary symptoms did not develop. As no microscopic examination was made, or in the failure to find spirochaetes in serum from the sore, it was always possible that the diagnosis was mistaken. In other words, there was no positive proof that the chancre was syphilitic and not a soft sore.

(b) *In the Case of the Second Attack.*—(1) A soft chancre, (2) a recurrent chancre, (3) a chancroidal gumma, or

(4) a pseudo-chancere (that is, a mucous genital syphilide which may have undergone induration), being mistaken for primary syphilitic chancres, or (5) the recurrent rashes being perhaps put down as fresh secondary syphilides and regarded as proof of a second attack.

Since the discovery by Schaudinn and Hoffmann of the *Spirochaeta pallida* as the cause of syphilis and the introduction of the Wassermann serum test as an aid to its diagnosis and cure, positive proof of reinfection can in certain cases be given apart from the clinical evidence.

We may lay down the following conditions:

1. In the first attack, *Spirochaeta pallida* being found from the chancre or syphilitic lesions (condyloma, mucous patch, or rash) or the blood giving a positive Wassermann reaction (here we must exclude the positive Wassermann of cases of hereditary syphilis); and

2. In the second attack, *Spirochaeta pallida* being found from the new chancre which appeared at a different site from the first chancre, and the blood at the same time giving a negative Wassermann reaction, which of course implies that the patient must have been seen shortly after the appearance of the second chancre, or at least before the blood had had time to become positive.

If we can produce cases to fulfil the above conditions, we have very strong confirmatory evidence apart from our clinical observation and opinion that reinfection has actually taken place.

The following list of cases of reinfection (Series I), which were all seen and treated by me during both attacks, fulfil the above conditions. The notes given are in each case those taken down at the time of the patient's first and second admission to hospital.

SERIES I.

CASE I.

First Admission (December 1st, 1915).—The patient was admitted to hospital with (1) a primary papular erosive syphilitic sore at the fraenum, (2) adenitis in both groins. There was no other visible sign of syphilis. The period of incubation was three weeks. *Spirochaeta pallida* was present on dark-ground examination. He was treated with eight injections of 0.3 gram of salvarsan and seven weekly injections of 1 grain mercury cream. Treatment was completed on February 22nd, 1916.

Second Admission (August 12th, 1916).—The patient was admitted to hospital a second time with (1) a primary granulating syphilitic sore on the anterior aspect of skin of foreskin, (2) glands in groins enlarged and shot-like. The incubation period was four weeks. *Spirochaeta pallida* was present on dark-ground examination. The Wassermann reaction was negative both before and after treatment. Treatment was the same as on his first admission, and was completed on October 3rd, 1916.

CASE II.

First Admission (August 24th, 1915).—Signs of infection: (1) Primary papular syphilitic sore on inner surface of prepuce; (2) shotty glands in both groins. No other visible sign. Incubation period uncertain. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and six weekly injections of 1 grain mercury cream. Treatment was completed on October 26th, 1915.

Second Admission (June 14th, 1916).—Signs of infection: (1) Typical papular erosive primary syphilitic sore on dorsal surface of prepuce; (2) shotty glands in both groins. No other visible sign. The incubation period was again uncertain. *S. pallida* present on dark-ground examination. Wassermann test negative. Treatment: Eight injections of 0.3 gram salvarsan with intervals, and five weekly injections of 1 grain mercury cream. Treatment completed August 26th, 1916.

CASE III.

First Admission (July 16th, 1915).—Signs of infection: (1) Typical meatal syphilitic chancre; (2) glands in both groins painlessly enlarged and swollen. No other visible sign. Incubation period four weeks. On dark-ground examination *S. pallida* was seen to be present. Treatment: Eight injections of 0.3 gram salvarsan and six weekly injections of 1 grain mercury cream. Treatment completed August 22nd, 1915.

Second Admission (June 21st, 1916).—Signs of infection: (1) Typical Hunterian chancre in left side of coronal sulcus; (2) glands in both groins slightly enlarged and hard. No other visible sign. Incubation period uncertain; sore noticed five days. *S. pallida* present on dark-ground examination. Wassermann test negative. Treatment: Three injections of 0.3 gram salvarsan and two weekly injections of mercury cream. The patient was transferred to another hospital for completion of treatment.

CASE IV.

First Admission (April 21st, 1915).—Signs of infection: (1) Large scar of primary, probably granulating, syphilitic sore on dorsum of body of penis; (2) condylomata on scrotum; (3) general adenitis. No other visible sign. Incubation period uncertain. Wassermann test positive. Treatment: Eight injections of 0.3 gram salvarsan and six weekly injections of 1 grain mercury cream. Treatment completed May 24th, 1915.

Second Admission (October 22nd, 1915).—Signs of infection: (1) Partly healed papular erosive primary syphilitic sore on outside of prepuce; (2) scar of former sore on body of penis; (3) adenitis in both groins. Incubation period uncertain. On October 26th Wassermann test negative, Stern incomplete; November 4th, Wassermann negative, Stern positive; December 15th, Wassermann positive, Stern positive. Treatment: Eight injections of 0.3 gram salvarsan and seven weekly injections of 1 grain mercury cream. Treatment completed February 5th, 1916.

CASE V.

First Admission (October 1st, 1915).—Signs of infection: (1) Typical Hunterian chancre on inner surface of prepuce; (2) enlarged and shot-like glands in both groins. No other visible sign. Incubation period uncertain; patient first noticed sore five days before. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and five weekly injections of 1 grain mercury cream. Treatment completed November 2nd, 1915.

Second Admission (March 28th, 1916).—Signs of infection: (1) Typical primary granulating syphilitic sore on outside of foreskin; (2) glands in groins hard and enlarged. No other visible sign. Incubation period four weeks. *S. pallida* present on dark-ground examination. Wassermann and Stern tests negative. Treatment: Eight injections of 0.3 gram salvarsan with intervals, and six weekly injections of 1 grain mercury cream. Treatment completed May 11th, 1916.

CASE VI.

First Admission (September 6th, 1915).—Signs of infection: (1) Sloughing primary papular syphilitic sore on end of prepuce; (2) glands in both groins hard and enlarged. No other visible sign. Incubation period five weeks; noticed sore seventeen days after exposure. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and five weekly injections of 1 grain mercury cream. Treatment completed October 12th, 1915.

Second Admission (March 24th, 1916).—Signs of infection: (1) Hard sore beneath prepuce—unable to completely retract foreskin; (2) glands in groin slightly enlarged. No other visible sign. Last exposure to infection two months before; noticed sore two weeks before admission. *S. pallida* present on dark-ground examination. Wassermann reaction negative. Treatment same as on first admission; completed May 9th, 1916.

CASE VII.

First Admission (October 10th, 1915).—Signs of infection: (1) Balanitis with indurated sore beneath prepuce; (2) shotty glands in groin and neck. No other visible sign. Incubation period uncertain; noticed sore two weeks before admission. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and five weekly injections of 1 grain mercury cream; completed November 11th, 1915.

Second Admission (September 30th, 1916).—Signs of infection: (1) Two typical primary papular erosive syphilitic sores on right side of coronal sulcus; (2) adenitis in groins. No other visible sign. Last exposure to infection six weeks before. *S. pallida* present on dark-ground examination. Wassermann reaction negative. Treatment: Three injections of 0.3 gram salvarsan and two weekly injections of 1 grain mercury cream. Transferred to another hospital for completion of treatment October 12th, 1916.

CASE VIII.

First Admission (August 6th, 1915).—Signs of infection: (1) Indurated papular erosive sore on inner surface of prepuce; (2) commencing roseolar rash on chest and abdomen; (3) general adenitis. No other visible sign. Incubation period four weeks. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and seven weekly injections of 1 grain mercury cream. Treatment completed September 21st, 1915, when the Wassermann reaction was negative.

Second Admission (September 26th, 1916).—Signs of infection: (1) Typical primary papular erosive syphilitic sore on inner surface of prepuce close to left of fraenum; (2) small abrasions on inner surface of prepuce on left side close to corona; (3) general adenitis. No other visible sign. Incubation period about four weeks. *S. pallida* present on dark-ground examination. Wassermann reaction negative. Treatment: Four injections of 0.3 gram salvarsan and two weekly injections of 1 grain mercury cream. Transferred to another hospital for completion of treatment October 21st, 1916.

CASE IX.

First Admission (June 29th, 1915).—Signs of infection: (1) Primary papular ulcerative syphilitic sore at fraenum, non-inflammatory syphilitic oedema of prepuce; (2) glands in both groins hard and enlarged. No other visible sign. Incubation period uncertain. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and six weekly injections of 1 grain mercury cream. Treatment completed July 31st, 1915.

Second Admission (May 16th, 1916).—Signs of infection: (1) Two fairly typical small primary syphilitic sores on inner surface of prepuce; (2) glands in groins hard and enlarged. No other visible sign. Last exposure to infection took place six weeks before. *S. pallida* present on dark-ground examination. Wassermann test negative. Treatment: Five injections of 0.3 gram salvarsan and five weekly injections of 1 grain mercury cream. Transferred to another hospital for completion of treatment June 26th, 1916.

CASE X.

First Admission (December 1st, 1915).—Signs of infection: (1) Primary indurated papular erosive syphilitic sore at fraenum; (2) bubo in left groin and shotty adenitis in right groin. No other visible sign. Incubation period unreliable. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and six weekly injections of 1 grain mercury cream; completed January 25th, 1916.

Second Admission (July 21st, 1916).—Signs of infection: (1) Typical Hunterian chancre on inner surface of prepuce extending into coronal sulcus; (2) shot-like glands in both groins. No other visible sign. Incubation period not reliable. *S. pallida* present on dark-ground examination. Wassermann test negative. Treatment: Eight injections of 0.3 gram salvarsan with intervals, and four weekly injections of 1 grain mercury cream; completed September 7th, 1916.

On the other hand there are cases of probably genuine reinfection that cannot fulfil the above conditions; for example, the conditions mentioned might be fulfilled with the exception that the patient was not seen in his second attack until the Wassermann reaction had become positive, or until secondary symptoms had appeared; such a case would then be open to the objection that it was really an instance of relapse, and not of reinfection.

In such a case the correctness of the diagnosis depends on the accuracy of the observation and the extent of the special experience of the practitioner, but anyone who has had considerable experience of syphilis must be fairly confident that he has seen genuine cases of reinfection, though the stringent conditions of "Series I" were not fulfilled.

In Series II will be found a record of such cases.

SERIES II.

CASE I.

First Admission (April 23rd, 1915).—Signs of infection: Small papular erosive syphilitic sore at fraenum. No other visible sign. Incubation period two weeks. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and six weekly injections of 1 grain mercury cream. Treatment completed May 22nd, 1915.

Second Admission (August 29th, 1915).—Signs of infection: (1) Typical Hunterian chancre on inner surface of prepuce; (2) glands in groins a little enlarged. No other visible sign. Incubation period uncertain; sore noticed six days before admission. Wassermann test negative. Treatment: Eight injections of 0.3 gram salvarsan and five weekly injections of 1 grain mercury cream. Treatment completed October 12th, 1915.

CASE II.

First Admission (May 28th, 1915).—Signs of infection: Indurated papular ulcerative syphilitic sore in coronal sulcus. No other visible sign. Sore noticed six days before admission. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and seven weekly injections of 1 grain mercury cream. Treatment completed June 29th, 1915.

Second Admission (September 10th, 1915).—Signs of infection: Non-inflammatory syphilitic oedema of prepuce with indurated lump to be felt beneath phimosed prepuce. Sore noticed for six weeks. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and five weekly injections of 1 grain mercury cream. Treatment completed October 13th, 1915.

CASE III.

First Admission (June 9th, 1915).—Signs of infection: (1) Typical primary papular erosive syphilitic sore on inner surface of prepuce; (2) shotty glands in groins. No other visible sign. Incubation period two weeks. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and six weekly injections of 1 grain mercury cream. Treatment completed July 20th, 1915.

Second Admission (July 22nd, 1916).—Signs of infection: (1) Primary granulating syphilitic sore on dorsum of body of penis; (2) glands in groin enlarged and shot-like. No other visible sign. Incubation period uncertain; sore noticed for five weeks. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan with intervals, and seven weekly injections of 1 grain mercury cream. Treatment completed September 7th, 1916.

CASE IV.

First Admission (September 9th, 1915).—Signs of infection: (1) Typical Hunterian chancre on inner surface of prepuce; (2) shotty glands in groins and neck. No other visible sign. Noticed sore eight days before admission. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and five weekly injections of 1 grain mercury cream; completed October 12th, 1915.

Second Admission (February 7th, 1916).—Signs of infection: (1) Typical papular erosive syphilitic sore near fraenum; (2) adenitis in groins. No other visible sign. The sore is distinct from scar of original sore. Incubation period two weeks. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan with intervals, and seven weekly injections of 1 grain mercury cream; completed March 20th, 1916.

CASE V.

First Admission (April 26th, 1916).—Signs of infection: (1) Typical primary papular erosive syphilitic sore in middle line of upper lip; (2) marked swelling of submaxillary glands and general adenitis; (3) macular papular rash covering body and limbs; (4) condylomata on scrotum. Denies all exposure to infection. Treatment: Eight injections of 0.3 gram salvarsan with intervals, and seven weekly injections of 1 grain mercury cream; completed June 13th, 1916.

Second Admission (July 24th, 1916).—Signs of infection: (1) Balanitis with a typical Hunterian chancre in coronal sulcus of penis; (2) glands in both groins enlarged and hard. No other visible sign. Incubation period uncertain. Wassermann test negative. Treatment: Five injections of 0.3 gram salvarsan and four weekly injections of 1 grain mercury cream. Transferred to another hospital for completion of treatment August 27th, 1916.

CASE VI.

First Admission (October 30th, 1915).—Signs of infection: (1) Primary papular erosive syphilitic sore on under surface of prepuce; (2) glands in groins hard and enlarged; (3) papular roseolar syphilide on body and limbs and also on face; (4) mucous patches on tonsils; (5) headaches. Incubation period uncertain; sore seen four weeks and rash ten days before admission. Treatment: Eight injections of 0.3 gram salvarsan and five weekly injections of 1 grain mercury cream; completed December 7th, 1915.

Second Admission (June 3rd, 1916).—Signs of infection: (1) Typical primary papular erosive chancre on lower lip just to left of middle line; (2) enlargement and hardness of submaxillary glands on left side. No other visible sign. Old scar of previous sore present under surface of prepuce. Most recent venereal exposure six weeks before admission. On dark-ground examination, *S. pallida* present from chancre on lip. Wassermann and Stern tests positive. Treatment: Eight injections of 0.3 gram salvarsan and five weekly injections of 1 grain mercury cream; completed July 24th, 1916.

CASE VII.

First Admission (August 4th, 1915).—Signs of infection: (1) Three typical primary papular erosive syphilitic sores in coronal sulcus of penis; (2) shotty glands in groins. No other visible sign. Incubation period sixteen days. On dark-ground examination, *S. pallida* present. Treatment: Eight injections of 0.3 gram salvarsan and seven weekly injections of 1 grain mercury cream; completed September 14th, 1915.

Second Admission (May 3rd, 1916).—Signs of infection: (1) Typical Hunterian chancre on inner surface of prepuce near fraenum; (2) glands in groins hard and enlarged; (3) faint macular rash on chest. Incubation period about four weeks. Treatment: Eight injections of 0.3 gram salvarsan with intervals, and five weekly injections of mercury cream; completed June 19th, 1916.

CASE VIII.

First Admission (September 3rd, 1915).—Signs of infection: (1) Typical papular erosive syphilitic sore on under surface of prepuce; (2) shotty glands in groins and neck. No other visible sign. Incubation period one month. Dark-ground examination, *S. pallida* present. Treatment: Eight injections of 0.3 gram salvarsan and five weekly injections of 1 grain mercury cream; completed October 5th, 1915.

Second Admission (March 9th, 1916).—Signs of infection: (1) Typical indurated sore at coronal margin; (2) bubo in right groin, glands in left groin. Scar of old sore on under surface of prepuce. Incubation period uncertain. Dark ground examination, *S. pallida* present. Treatment: Eight injections of 0.3 gram salvarsan with intervals, and six weekly injections of mercury cream; completed May 4th, 1916.

CASE IX.

First Admission (February 5th, 1915).—Signs of infection: (1) Typical primary papular erosive syphilitic chancre at fraenum; (2) glands in both groins enlarged and hard. No other visible sign. Incubation period uncertain. Treatment: Eight injections of 0.3 gram salvarsan and six weekly injections of 1 grain mercury cream; completed April 10th, 1915.

Second Admission (May 25th, 1916).—Signs of infection: (1) Typical Hunterian chancre on inner surface of prepuce; (2) general adenitis. No other visible sign. Incubation period about four weeks. Treatment: Eight injections of 0.3 gram salvarsan with intervals, and four weekly injections of mercury cream; completed July 30th, 1916.

CASE X.

First Admission (August 18th, 1915).—Signs of infection: Large papular erosive syphilitic sore on outer surface of foreskin. There was no enlargement of glands and no other visible sign. Incubation period two weeks. Dark-ground examination, *S. pallida* present. Treatment: Eight injections of 0.3 gram salvarsan and six weekly injections of 1 grain mercury cream; completed September 19th, 1915.

Second Admission (June 2nd, 1916).—Signs of infection: (1) Typical primary granulating syphilitic sore on under surface of prepuce; (2) glands in groins painlessly enlarged and hard. No other visible sign. Incubation period three weeks. Dark-ground examination, *S. pallida* present. Treatment: Eight injections of 0.3 gram salvarsan with intervals, and three weekly injections of mercury cream; completed July 21st, 1916.

CASE XI.

First Admission (December 27th, 1914).—Signs of infection: (1) Scar of sore on glans penis; (2) slight general adenitis; (3) mucous patches on tongue and on right tonsil. No other visible sign. Incubation period uncertain. Treatment: Eight injections of 0.3 gram salvarsan and six weekly injections of 1 grain mercury cream; completed February 23rd, 1915.

Second Admission (January 26th, 1916).—Signs of infection: (1) Two primary papular erosive syphilitic sores beneath prepuce; (2) shotty glands in groins. No other visible sign. Last exposure to infection five weeks before admission. Dark-ground examination, *S. pallida* present. Treatment: Eight injections of 0.3 gram salvarsan with intervals, and seven weekly injections of mercury; completed March 21st, 1916.

CASE XII.

First Admission (July 4th, 1915).—Signs of infection: Non-inflammatory syphilitic oedema of skin of penis, hard nodule felt beneath phimosed prepuce. No other visible sign. Incubation period ten days. Dark-ground examination, *S. pallida* present. Treatment: Eight injections of 0.3 gram salvarsan and six weekly injections of 1 grain mercury cream; completed August 17th, 1915.

Second Admission (June 15th, 1916).—Signs of infection: (1) Primary papular erosive syphilitic sore on inner surface of prepuce; (2) marked adenitis in both groins. Scar of old sore present. Incubation period three weeks. Wassermann test incomplete, Stern positive. Treatment: Eight injections of 0.3 gram salvarsan with intervals, and five weekly injections of 1 grain mercury cream; completed August 7th, 1916.

CASE XIII.

First Admission (November 5th, 1915).—Signs of infection: (1) Typical Hunterian chancre at fraenum; (2) adenitis in groins and neck. No other visible sign. Incubation period one month. Treatment: Eight injections 0.3 gram salvarsan with intervals, and seven weekly injections of 1 grain mercury cream; completed February 8th, 1916.

Second Admission (July 8th, 1916).—Signs of infection: (1) Typical Hunterian chancre on right inner surface of prepuce; (2) adenitis in groins. No other visible sign; scar of previous sore at fraenum. Last exposure to infection about five weeks before admission. Wassermann and Stern tests negative. Treatment: Same as on first admission; completed August 24th, 1916.

CASE XIV.

First Admission (September 22nd, 1915).—Signs of infection: Two primary papular erosive syphilitic sores, one on inner surface of prepuce, one close to fraenum. No other visible sign. Incubation period not reliable. Dark-ground examination, *S. pallida* present. Treatment: Eight injections of 0.3 gram salvarsan and five weekly injections of 1 grain mercury cream; completed December 6th, 1915.

Second Admission (July 16th, 1916).—Signs of infection: (1) Typical Hunterian chancre in coronal sulcus just to right of dorsal middle line; (2) general adenitis and a right bubo; (3) papular squamous rash over body and limbs; (4) mucous patch on inner side of upper lip. Scar of old sores present. Incubation period not reliable. Treatment: Eight injections of 0.3 gram salvarsan with intervals, and six weekly injections of 1 grain mercury cream; completed August 30th, 1916.

CASE XV.

First Admission (November 6th, 1915).—Signs of infection: (1) Primary papular erosive syphilitic sore at fraenum; (2) indurated glands in groins. No other visible sign. Last exposure to infection five weeks before admission. Dark-ground examination, *S. pallida* present. Treatment: Eight injections of 0.3 gram salvarsan and five weekly injections of 1 grain mercury cream; completed December 7th, 1915.

Second Admission (December 19th, 1916).—Signs of infection: (1) Primary Hunterian chancre in coronal sulcus; second primary granulating syphilitic sore on under surface of prepuce; (2) glands in both groins enlarged and hard. No other visible sign. Last exposure to infection about six weeks before admission. Wassermann test positive. Treatment: Three injections of 0.3 gram salvarsan, one of 0.4 gram, three of 0.5 gram with intervals, and five weekly injections of 1 grain mercury cream. Treatment completed February 15th, 1917, when the Wassermann reaction was negative.

CASE XVI.

First Admission (January 9th, 1915).—Signs of infection: (1) Typical Hunterian chancre on inner surface of prepuce; (2) roseolar syphilide on chest. No other visible sign. Incubation period one month. Treatment: Four injections of 0.3 gram salvarsan and eight weekly injections of 1 grain mercury cream; completed March 2nd, 1915. On March 7th, 1916, the patient was readmitted with ulceration of both tonsils; no other visible signs. He was given a full course of eight injections of 0.3 gram salvarsan with intervals, and five weekly injections of 1 grain mercury cream. He was discharged to duty on May 3rd, 1916.

Second Admission (October 2nd, 1916).—Signs of infection: (1) Early primary papular erosive syphilitic sore in left of coronal sulcus; (2) glands in groins painlessly enlarged and hard and shot-like. No other visible sign. Incubation period two weeks. Treatment: Three injections of 0.3 gram, one of 0.4 gram, and three of 0.5 gram salvarsan with intervals, and

six weekly injections of 1 grain mercury cream; completed December 9th, 1916. The Wassermann reaction was incomplete both before and after treatment.

CASE XVII.

First Admission (December 4th, 1915). Signs of infection: (1) Balanitis, a hard nodule to be felt under foreskin about level of fraenum; (2) glands in groin shot-like and enlarged. No other visible sign. Last exposure to infection about six weeks before admission. Treatment: Eight injections of 0.3 gram salvarsan with intervals, and seven weekly injections of 1 grain mercury cream; completed January 25th, 1916.

Second Admission (April 12th, 1917).—Signs of infection: (1) A typical primary papular erosive syphilitic sore occupied fraenal site; (2) painless shotty adenitis in left groin. No other visible sign. Incubation period one month. Dark-ground examination, *S. pallida* present. Treatment: Seven weekly deep subcutaneous injections of 0.6 gram salvarsan and five weekly injections of 1 grain mercury cream; completed May 28th, 1917. The Wassermann reaction was negative both before and after treatment.

CASE XVIII.

First Admission (May 22nd, 1915).—Signs of infection: (1) Small papular erosive syphilitic sore on under surface of foreskin; (2) glands in both groins enlarged; (3) macular rash on body. No other visible sign. Incubation period one month. Treatment: Eight injections of 0.3 gram salvarsan and six weekly injections of 1 grain mercury cream; completed July 13th, 1915.

Second Admission (March 2nd, 1917).—Signs of infection: (1) Phimosis, unable to retract foreskin; a clean indurated granulating syphilitic sore on anterior surface of skin of penis; (2) glands in groins painlessly enlarged and shot-like. No other visible sign. Incubation period eighteen days. Treatment: Six weekly injections of 0.6 gram salvarsan, deep subcutaneous; five weekly injections of 1 grain mercury cream. Treatment completed May 1st, 1917. The Wassermann reaction was negative both before and after treatment.

The cases in this series are not supported by the bacteriological findings and serum tests, and so do not comply with the conditions laid down for Series I, still the likelihood of the correctness of the diagnosis is enhanced by the fact that again, as in the cases given in Series I, the two distinct attacks of syphilis have been seen in all the cases here recorded by the same observer. The cases were seen, the notes checked, and the treatment of each patient carried out by me at the time of his first and second attack.

The above 28 cases of reinfection occurred in a series of 10,500 cases of syphilis treated in No. — General Hospital during the past two years.

For the Wassermann tests and dark-ground examinations I am indebted to Captains A. Dawson and A. T. MacWhirter, R.A.M.C., and I wish to thank Sergeant G. T. Platford, R.A.M.C., for the trouble he has taken in summarizing the notes on the cases given in Series I and II.

THE MEDICINAL TREATMENT OF GONORRHOEA.

BY

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A QUESTION which was frequently asked by many medical officers who visited a certain venereal hospital for the purpose of inquiring into the routine methods of treatment was, "Is irrigation into the bladder any better than flushing of the urethra from within by the use of medicines?" With a view to deciding this question permission was granted to treat cases with medicine alone.

Routine treatment as carried out generally in the above mentioned hospital in ordinary cases meant three irrigations a day into the bladder, prostatic massage, and instrumental treatment where indicated.

Method of Treatment.

The intention at first was to have a control series of one hundred patients on routine irrigation treatment and another series of one hundred patients on medicinal treatment. When, however, volunteers were called for every patient volunteered for the medicinal treatment, and it was then decided, in order to have the full confidence of the patients, to give every patient medicinal treatment. Accordingly the whole division, consisting of about two