ecchymosis appeared on the left heel, but no further extension of the trouble occurred, and on June 7th, 28 days after the amputation, the patient left the hospital on crutches.

The examination of the amputated leg was very interesting. Immediately below the point where the popliteal vein had been divided that vessel was joined by the external saphenous vein and by a small collateral vein of the popliteal of similar size to the external saphenous. The main popliteal vein possessed four sets of valves and was thrombosed below the highest set, the thrombus being soft and red and causing the vein wall to bulge markedly above each pair of valves. The external saphenous and the small collateral vein were liberally provided with valves, which showed a small thrombus in the dilated portion above each valve, but neither of these vessels was completely thrombosed above the level of the division of the popliteal vessels into anterior and posterior tibials. The internal saphenous vein was patent down to the level of the knee-joint, but was thrombosed below. All arteries in the amputated limb were very degenerated and were filled with fibrinous clot which completely occluded their lumina.

Commentary.—The case is both interesting and disappointing. The patient was very feeble, and gangrene had already set in when the arterio-venous anastomosis was made. This latter was, *per se*, absolutely successful, there being no leakage at the suture line, and immediate re-establishment of the blood stream and pulse, and at no time any obstruction at the point of union of the artery to the vein. It is, moreover, worthy of note that, after the amputation, the suture line was strong enough to withstand a pressure of blood which was sufficient to cause a marked dilatation of that portion of the popliteal vein which lay between the suture line and the ligature in the end of the stump.

This is the first application of the quill-suture method of blood-vessel suture in human surgery, and our experience leads us to say that, while the finest silk suture was quite strong enough and perfectly satisfactory, the catgut used for the quill might with advantage and convenience have been a little thicker, at any rate for so large a vessel as the femoral, and should be capable of resisting absorption for not less than one month.

The effect of the anastomosis on the limb was certainly not harmful and may have hastened the formation of a line of demarcation.

Although examination of the amputated extremity showed considerable thrombosis in the veins below the level of amputation, it would appear that there must have been some conveyance of blood downwards on the part of those veins which were not completely thrombosed, on account of the increased warmth and fulness of the veins over the front of the knee after the anastomosis and before amputation, and also on account of the marked distension of the vein between its junction with the artery and its ligature in the stump after the amputation. This distension coincided with an increase in strength and blood pressure on the part of the patient, and with the closure of the main outlets for blood from that portion of vein between the suture line and the ligature. Had this distension occurred sooner, the valves of the popliteal vein would have been made thereby incompetent, and their obstruction to the vein taking on the function of an artery done away with.

There can be no doubt that the thrombosis in the veins of the extremity had spread upwards from the gangrenous area, as is shown from the internal saphenous, which had been ligatured near the saphenous opening at the time of the first operation, being patent down to the level of the knee-joint but thrombosed below that level as it approached the gangrenous region. The popliteal vein having the strongest and thickest walls of any vein in the body, it might have been beneficial to have passed some blunt instrument along it in a downward direction to force the valves before completing the suture.

It is important to draw attention to the possible short circuits to the circulation in any procedure of this kind owing to the free intercommunications everywhere existing between veins. The most obvious of these short circuits we endeavoured to deal with by ligaturing the internal saphenous vein as near the saphenous opening as possible, but there must have been others, both superficial and in the muscles of the thigh, which were not, and indeed could not have been, dealt with.

Finally, in a patient so feeble as ours, such an operation as was performed would have been out of the question had we not had spinal analgesia available instead of general anaesthesia. The spinal analgesia induced was extremely satisfactory both to ourselves and to the patient.

THE TREATMENT OF SYPHILIS BY INTRAMUSCULAR INJECTION OF INSOLUBLE SALTS OF MERCURY AS CONTRASTED WITH THE INUNCTION METHOD: A CRITICAL REJOINDER.*

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I READ Dr. G. Pernet's interesting paper in THE LANCET of July 24th, 1909 (p. 212), "The Intramuscular Treatment of Syphilis, with special reference to the Insoluble Preparations of Mercury—a Critical Review," and submit the following remarks for the consideration of those interested in this important subject.

Dr. Pernet states that at the meeting of the British Medical Association at Sheffield in 1908 "Professor Neisser of Breslau and he were the only two speakers who were resolutely in favour of the use of insoluble preparations." He also adds that "mercurial cream injections are used in the British Army notwithstanding the adverse criticism of many British dermatologists given in evidence before the Commission of Inquiry, although apparently they had no actual experience of the method." The latter part of the statement is, I think, incorrect. As regards "civil" hospital practice, Mr. Charles Gibbs of the London Lock Hospital, who gave expert testimony at this Commission, stated that "severe relapses are twice as frequent after injections as after the inunction or pill treatment, and iritis is peculiarly common in the relapse after intramuscular injections."¹ Mr. Arthur H. Ward, in revising the records of the Lock Hospital, London, says: "He was struck by the number of patients who only took one injection and never came again."² The late Dr. Radcliffe Crocker, who held a European reputation both as an author and dermatologist, stated, "from a study of the literature of the subject it seems that the dangers from insoluble preparations are considerably greater than those from soluble, and if salivation once sets in you have no controlling power over it at all."³

Dr. Pernet in his article records seven deaths, in France, under intramuscular injection of insoluble salts of mercury. There are also seven deaths on record in the British Army in the report of the above Commission of Inquiry. Mention of these is omitted by Dr. Pernet, but to show "that no method is perfect" he cites two deaths under inunction due to mercurial exfoliating dermatitis. This condition, as pointed out by Fournier, in France, "has been described under the name of hydrargyria febrilis maligna. It is not peculiar to the inunction method, and may occur with all the different modes of administration. Moreover, it is due to a rare idiosyncrasy."⁴ Barthélemy reports ten cases treated by cyanide of mercury intramuscular injections. "All had stomatitis, and two developed intense scarlatiniform rashes with pyrexia followed by desquamation. After recovery a second injection was followed by a more severe erythema and pyrexia."⁵

Surgeon-General Fawcett, R.A.M.C., in a valuable contribution, states that at Cairo, Egypt, between April and July, 1901, "a series of cases of mercurial poisoning has arisen amongst soldiers undergoing treatment for constitutional syphilis by intramuscular injections of mercury, and of so grave a character that a full report is necessary. There were two deaths, three men invalided to England, and seven cases of excessive mercurial ptialism."⁶

CASE 1.—Private C. came under treatment Sept. 11th, 1900, at the Station Hospital, Cairo. From this date to April 3rd, 1901, he received as an out-patient 18 injections of 10 minims of standardised grey oil (Hg = gr. 2) in a period of 30 weeks—that is, 36 grains of metallic mercury in 30 weeks. He was admitted to hospital on April 24th, 1901, with ulceration of the soft palate, spongy gums, the third molar being

* The superior figures refer to the bibliography at the end of the article.

almost enveloped, salivation, and fœtor of breath. On June 1st anorexia and debility had set in, and on the 2nd he died. Post mortem there was a large, firm, ante-mortem clot in the left chambers of the heart. The large intestine was congested, the small one normal. The tongue was swollen and there was ulceration of the buccal mucous membrane.

CASE 2.—Private R. From 1894 to 1898 there were many admissions for constitutional syphilis. In November, 1899, he was 32 days in hospital with syphilis. On Dec. 18th, 1900, he was admitted to hospital with syphilis, and received 12 intramuscular injections of insoluble grey oil 10 minims each (Hg = gr. 2) up to March 18th, when he was discharged from hospital. He received injections on April 3rd, 10th, and 24th, and May 1st. Total 32 grains metallic mercury. He was admitted to hospital on May 8th—ptyalism, symptoms of syphilis present, perforation of palate and a scaly syphilide of lower extremities. He went to Alexandria for change of air on June 20th. On July 6th he was readmitted to hospital with severe stomatitis. He improved and then retrograded with rapid severe relapses as some fresh focus of mercury became absorbed. Progressive emaciation occurred despite a large ingestion of food. His weight fell from normal (11 stones) to 7 stones. On August 17th he died from exhaustion. Post mortem there was extreme emaciation together with ulceration of the buccal mucous membrane and periostitis of the lower jaw. The mucosa of the sides of the tongue was deeply ulcerated, the epiglottis and glosso-epiglottidean folds being much involved. The condition of the bowels was not noted. The tissues were searched chemically and microscopically for traces of mercury but none could be found.

CASE 3.—Private S. Commenced continuous treatment for syphilis in April, 1900. Discharged from hospital on June 6th. From June 6th to Feb. 7th, 1901, he received 17 injections of standardised grey oil, and one on March 13th and another on the 27th. On May 1st there were marked tenderness of the gums and slight ulceration of the buccal mucous membrane on the right side. The alimentary tract was extensively involved, the tongue was furred, and the digestion was bad, whilst traces of blood were noticeable in the stools. He was admitted to hospital on May 3rd with progressive ulceration of the mouth, and dysenteric condition of the bowels; salivation was present. He improved and was discharged from hospital. An exacerbation of stomatitis ensued and he was readmitted to hospital. He was transferred to Alexandria for a change of air on July 4th, 1901, and after a protracted illness was invalided to England on Nov. 14th, 1901.

CASE 4.—Private M. received four injections of Mx . grey oil (gr. 2 Hg) between Jan. 19th and March 2nd, 1901. He then received five more—viz., on March 2nd, 13th, 20th, April 3rd and 10th. On April 24th, 1901, he was admitted to hospital with intense salivation, marked fœtor of breath, and slight ulceration of the mouth. He improved in hospital, and after a change of air at Alexandria he recovered. He received in all 18 grains of metallic mercury in the nine injections.

The report clearly shows, in regard to the above four cases and the other eight cases, "that it was purely due to sudden uncontrollable poisoning by grey oil, and the medical officers were all careful, extremely reliable men, who had two years' actual experience of the method of injection." This appears to conflict with Dr. Pernet's statement "that when intramuscular injections of grey oil are carried out with care and precautions complications do not arise." On pages 27 and 28 of the First Report of the Advisory Board on "Venereal Diseases in the Army" 110 cases of pulmonary embolism are also cited under injection of insoluble salts; "none were fatal, although some presented alarming symptoms." It is also stated:—

CASE 5.—At Barrackpore, India, in 1895, the patient received eight weekly injections of Mx . grey oil (mercury $\frac{3}{4}$ 1, lanolin $\frac{3}{4}$ 2, olive oil $\frac{3}{4}$ 1 $\frac{1}{2}$). He became salivated with swollen ulcerated gums. He temporarily improved under treatment. Recurrent diarrhœa, pyrexia, difficulty of swallowing, and symptoms of dysentery finally appeared. He died. Post mortem there was necrosis of the lower jaw at each angle. The mucous membrane of the large intestine was quite black and on the point of sloughing. Numerous small ulcers, old and recent. Kidneys congested; weight 12 ounces.

CASE 6.—Case of syphilis with history of dysentery. The patient received two injections of Lambkin's cream. 15 days after the second injection salivation and ulceration of the tongue and pharynx ensued. These healed under treatment. Severe diarrhœa set in, and continued up to his death six weeks after the last injection. Post mortem old and new ulcers of large intestine were found.

CASE 7.—Old-standing syphilis. He received four injections of Lambkin's cream. A week after the last injection he became salivated with spongy ulcerated gums. There were ulcers on the tongue, cheeks, and palate. The parotid gland was swollen and painful. Improvement occurred, then relapse of the stomatitis and severe diarrhœa. He died, collapsed, seven weeks after the last injection. Post mortem the liver weighed 72 ounces; healthy lower 5 feet of the small intestine were much congested. Large intestine showed blue discolouration of the mucous membrane, and worn away in patches without being ulcerated. The kidneys were large. Death was ascribed to syphilis.

CASE 8.—Japha reported a death after two injections of 1 centigramme each of salicylate of mercury in a case of syphilis with paraplegia.

In the *British Medical Journal*, 1896, p. 55, nervous symptoms and poisoning after mercurial injections are reported. Dr. Arthur Whitfield of London further informed me of a medical man on the Continent who stated that he had treated a series of cases by injection of insoluble salts of mercury, "with only two deaths." Possibly this explains Dr. Whitfield's statement "that he considered the use of insoluble preparations such as grey oil as hardly justifiable in view of the recorded deaths from this method of treatment." ⁷ The above list of deaths, however, clearly shows

the absolute necessity for extreme care with the insoluble injection method.

As regards my personal experience of this method, I never give it to in-patients now, as I consider other methods much more valuable. I have probably given or seen administered 15,000 injections of insoluble grey oil (Lambkin's formula) to "out-patients." I never give more than six weekly injections of 10 minims each of the standardised mercurial cream (Lambkin's formula). This contains one grain metallic mercury in each dose. I allow an interval of from two to three months, then another course as above, and so on for two years. The cases are taken into hospital for treatment when relapse occurs. My experience, as stated elsewhere,⁸ is that although injections of insoluble salts of mercury are unquestionably "convenient" in the army for "out-patients" who attend weekly, yet they have not the same curative action on syphilis in the early stages as that by the inunction method, or hydrargyrum cum creta with opium, since the induration of the chancre and inguinal glands, in my experience, persists for a longer time under injections than under inunctions. I formerly questioned the alleged "slow absorption and elimination of insoluble salts of mercury."⁹ In 1905, at Woolwich, when grey oil injections were used for both in-patients and out-patients, there were 54 admissions to hospital for relapse of syphilis. The method of inunction was substituted for in-patients on my arrival in October, 1905. In 1906 there were 27 admissions for relapse; in 1907, 22; and in 1908, 13. The duration in hospital in 1906, 1907, and 1908 was less, and the constantly sick ratio for syphilis in 1908 was one-fourth that of 1905. (*Vide* Table I.)

Dr. Pernet states: "In dealing with the insoluble preparations, and especially grey oil, I have referred mainly to French medical literature, for the simple reason that it is in France that they have been mainly employed. In England and the United States this method of treatment has not been applied to any extent, but only made use of sporadically." I must, however, contradict this statement as regards the British army: "At the present time (1904) about 1 $\frac{1}{2}$ pounds of mercurial cream (grey oil, Lambkin's formula) are being supplied weekly for use in the British army. This corresponds to about 1500 injections per week."¹⁰ As regards "French" medical literature, Dr. T. Dohi, "taking advantage of the death of a syphilitic patient from a fatal enteritis brought on by mercurial injections, studied the phenomena at the site of introduction of metallic mercury. He also made experimental inoculations into rabbits and dogs. In fact, little collections of metallic mercury can be found as long as 11 weeks after the injection."¹¹ This period approximates to that when death occurred in some of the foregoing cases. M. Hallopeau (France) pointed out in February, 1909, "that mercurial oil remained long in the tissues in a metallic state, and was apt to form deposits which became absorbed in quantity and cause grave symptoms of mercurial poisoning."¹² "In some cases deposits of mercury have been revealed by X rays and excised, thus cutting short the stomatitic symptoms."¹³ Colonel Lambkin, speaking of injections of grey oil, states "one disadvantage is that should salivation take place after injection it is a difficult matter to prevent the symptoms getting worse unless the mercury is removed. This has been done by excision, but the operation to effect this is as difficult as it is dangerous."¹⁴

As far as Dr. Pernet's own experience goes, he states: "I have only employed the intramuscular injections in my private practice. No ill-effects ensue after 10-12 consecutive weekly injections of doses varying from 1-10 centigrammes." I am of opinion, and it is the usual practice in the British army, that weekly insoluble injections of standardised grey oil (Hg = gr. 1) should not ever be made for over six weeks, and in certain cases four weeks. I once saw on arrival at a foreign station a severe epidemic of stomatitis in men who had received eight consecutive weekly injections of standardised grey oil Mx (Hg = gr. 1) prior to their coming under my care. It took three months' careful treatment to put some of them right. Stomatitis, however, may occur with any method if care and caution are not rigidly exercised, oral sepsis, carious teeth, and personal idiosyncrasy being important factors in its causation. The stomatitis due to injection, however, is impossible to obviate by suspending the remedy as usually suffices with other methods, since the drug may lie latent in the muscle for weeks and then be suddenly thrown into the system. The

principal objection of certain civil experts in the Commission of Inquiry to the intramuscular injection method was "that it decimated their clinics,"¹⁵ and *ipso facto* syphilis would be unduly spread. It would appear from the following evidence that a similar experience occurred in civil clinics in France, where, as Dr. Pernet states, "the insoluble preparations, and especially grey oil, have been mainly employed."

Professor Fournier (Paris), in speaking of calomel intramuscular injections in France, says¹⁶: "The patients usually settle the question themselves either by informing their doctor that they will not hear of 'pricking,' or by leaving him to seek another who will treat them otherwise. At the hospital they change their day of attendance, and in the polyclinic they do not come again. What a number of cases of this kind I could mention. How many times have I heard my private patients tell me, 'For heaven's sake, doctor, no more injections. Prescribe everything else and I will obey, but as for your confounded injections I do not want any more. They really make me too ill. I cannot bear them any longer.'" Fournier cites two cases. 1. A case under the care of Dr. de Amicis, of a man, aged 53 years, secondary syphilis. Injections of sublimate were given. At the forty-fourth injection, made between the inferior angle of the scapula and the spine, violent pain was felt. On the third day complete paraplegia ensued, followed by bed-sores. Death occurred in a month. 2. A case under the care of Dr. Racocineanu of Bucharest. Injections of sublimate caused gangrene of foot. This necessitated amputation of the leg. Histological examination—adhesive phlebitis of the vein. Professor Fournier further states: "For my part I can certify to the possibility of treating and of curing the great majority of the manifestations of syphilis without having recourse to injections of calomel (and others besides). On this point I am in agreement with nearly all syphilologists." He continues, that Besnier, for example, after having made a long and conscientious study of the method of mercurial injections, arrived at the conclusion "that injections should not be performed in the treatment of ordinary syphilis." Mauriac also remarks "that out of a hundred cases of syphilis there is not one certainly which requires treatment by injections." Augagneur, after deliberate discussion, considers "that in the great majority of cases syphilis does not require injections in order to cure it." Has not the same opinion been many times stated and restated by a number of observers, such as Renaut, Barthélemy, Verchere, and others.

From a close examination of the foregoing evidence in a country where it has been extensively used it would appear that French medical opinion after a thorough trial is by no means unanimous as to the superiority of intramuscular injections over other methods. Inunctions form the routine method of treating syphilis in the French army and in some large civil institutions. The inefficiency in hospital from syphilis is much less in the French as contrasted with the English army, and similarly in the German army where inunctions are in routine use in the military hospitals and almost exclusively used in the civil clinics. From 1886 to 1890 the ratio of admissions per 1000 of strength in the German army was 27, in the French army 51, and in the British army 212. In 1900, German 17, French 37, British 93.¹⁷ The reduction, in 1900, in the British army, as later explained, is due to a marked diminution in India as the result of the control of diseased persons since October, 1897. I concur in Dr. Pernet's view "that intramuscular injections, whether of soluble or insoluble preparations, are but one means of treating the disease and that intramuscular injections, especially the insoluble, are not to be given in a routine manner for any and every case of syphilis." I also consider with him that mercurial treatment should begin with the primary chancre—when recognised.

In 1898 I wrote: "To wait for the appearance of secondary lesions before commencing mercury is to lose an opportunity that can never be regained. It is during the period of so-called incubation (the period preceding the appearance of secondary symptoms) that the red blood corpuscles lose their pigment, as evidenced by the anæmia, debility, and lassitude that usually occur. The exhibition of mercury in small doses which has been proved to increase the number of red corpuscles and hæmoglobin is then essential. It is, moreover, an excellent tonic in small doses, especially in combination with opium. The length of time over which

symptoms manifest themselves in syphilis is in the vast majority of cases purely a question of early treatment."

Patients suffering from malarial and tropical affections, as mentioned by Dr. Pernet, certainly "bear inunctions badly." I consider that the administration in such cases of any form of mercury, more especially "injections," requires very great care and experience. Matthias states that in the works of the very learned Boerhaave this general axiom is laid down: "That the fat of the body even to the last particle must be drawn off in the case of the venereal disease, for even if the least particle remains we must dread a relapse."¹⁸ This apparently happened in Case 2 previously quoted, when the man lost 56 pounds before death. The learned Boerhaave also says "that if the patient spits three pints to two quarts in the 24 hours, it is sufficient, but if he spits less more mercury must be given." In the surgical works of Richard Wiseman, serjeant-surgeon to King Charles II., when speaking of the lues venerea, he directs "twenty to thirty grains of calomel as a daily dose, to be followed after 4 or 5 days with a few grains of turbit mineral if their chops do not swell."¹⁹ It appears in the record of 20 deaths under mercurial injections previously cited that extreme salivation occurred, and that the gums swelled with comparatively small doses of mercury. I consider, therefore, that the "method" of administration rather than an excessive dose is responsible for the deaths. It is also to be expected that if insoluble "oily" preparations are injected into muscles primarily intended by nature for locomotion embolism is very apt to occur. This may possibly explain the 110 cases of pulmonary embolism previously cited, as well as the case of gangrene ending in amputation of the leg. It would further appear to be just as great an error in the present age to cause "fat" or other kind of embolism as "to withdraw every particle of fat from the body," as recommended by the learned Boerhaave aforementioned a century and a half ago. With the inunction method we can largely guard against mercurial poisoning by the daily bath and with mouth methods by stopping the drug. Control, however, is lost once an injection is made. We knew the dose and can see it injected, but a remedy that can cause death before it is eliminated requires, like innovation of all kinds, "to be held for a suspect" (Bacon).

Colonel Lambkin states²⁰ "that intramuscular injection has never found favour in England and her worldwide Empire, the exception being in her army, where since 1889 it has been gradually pushing its way through the brilliant results which have been attained, especially in India, where during the last decade admission to hospital for syphilis amongst British troops has fallen from 400 per 1000 to 110 per 1000 as the result almost entirely of the adoption of the intramuscular method of administering mercury." The foregoing figures are incorrect, and the deduction is vitiated by the fact that an important legislative measure (the Cantonment Act) was introduced into India in October, 1897. This prophylactic measure considerably influenced the incidence of all forms of venereal disease, as the Act established effective control over both diseased men and women. In India in 1897 amongst British troops (70,000 men) the admission ratio was 106·2 per 1000 for secondary (constitutional) syphilis, and 125·6 per 1000 for primary syphilis.²¹ In India in 1907 (ten years later) amongst the same number of troops, the admission ratio for syphilis was 22 per 1000.²² In 1904, however, a radical change was made in collecting syphilis statistics throughout the army, as explained in the preface to my recent book,²³ the term "primary" syphilis (which included numerous errors of diagnosis) being entirely done away with, and so a marked reduction in venereal disease ensued as the result of more accurate returns (*vide* Table I., in regard to one garrison town, Woolwich). Further, in 1904, the attendance of soldiers as out-patients for syphilis was made compulsory throughout the British army, both at home and abroad, so that readmission to hospital for lapse of disease was consequently much lessened. Gonorrhœa and soft chancre, which are not treated by mercury, were also much reduced in India, the admission ratio in 1907 for gonorrhœa being only 48 per 1000, as contrasted with 114 per 1000, the decennial average for the years 1897-1906. The admission ratio in 1907 for soft chancre was 19·7 per 1000, as contrasted with 60 per 1000, the decennial average for the years 1897-1906, and similarly with the "constantly sick" ratio (*vide* p. 243, Army Medical Department

Reports, 1907). If we contrast, therefore, the decennial period 1897-1907 with the previous years, 1889-97 (when no control of diseased men and women existed in India), it can be readily seen from the Army Medical Department Reports that there was a steady "increase" of all forms of venereal diseases, including syphilis, from the year 1889 to 1897 in spite of treatment by injections of insoluble salts of mercury or other methods. I claim, therefore, that the admittedly brilliant results in the British army, especially in India, during the past ten years, by means of which a very great reduction in all forms of venereal disease has been effected, did not, as stated by Colonel Lambkin, "result almost entirely from the intramuscular method of administering mercury," but are principally due to the above preventive legislative control of diseased persons subsequent to 1897; to more careful and prolonged in-patient hospital treatment in the more contagious and remediable phases, which limits the local spread of disease; to systematised out-patient attendance under the valuable provisions of Appendix VII., Regulations for Army Services, as well as to the united efforts of army medical officers over a long series of years, rather than to any special mode of treatment. Further, in a recent valuable report (August 31st, 1908) on 64 stations visited in India by Major A. P. Blenkinsopp, R.A.M.C., it is shown by statistics on page 11 that relapses of syphilis with consequent readmission to hospital in the years 1906-07 were much more frequent under intramuscular injections of mercury than under other methods, such as inunction or ingestion. Further evidence is contained in an important article by Captain J. Dorgan, R.A.M.C., who says: "I treated 90 men for three years in one station, in India, giving them over 5000 injections of mercurial 'grey oil,' 65 per cent. did well under the injection, but they were all cases who had received a thorough preliminary 'hospital' treatment by inunction, or hydrarg. cum creta. I never used the injection treatment in hospital. The remainder of the cases (35 per cent.) showed definite relapses under injections although they had 40-70 injections before they showed symptoms. The routine was to admit them to hospital and press the dose to tolerance by inunction, or hyd. c. creta. This tolerance could not with safety be approached by injection, knowing as we do that the next dose may lead to serious, if not fatal, results. This fact must always remain a definite objection to the logical treatment of the disease by injection alone. It is with much diffidence that I record this personal opinion. I may say, however, that it was formed without bias after close and enthusiastic study of a considerable number of cases."²⁴

Professor Fournier states: "I am satisfied that the inunction method is equal to, if not better than, any other. I am convinced that if we had to deal with an ideal patient who tolerated inunction, and carried it out regularly and for the whole of the necessary time, we should attain a result which would leave nothing to be desired. I, therefore, conclude that inunction constitutes an excellent mode of treatment. The therapeutic effects are intense."²⁵ Sir Jonathan Hutchinson, in England, uses the "ingestion" method and prescribes grey powder with opium, not because he considers it more valuable than inunction, but because he "finds it more convenient in treating private patients." In the public service we are primarily concerned with practical utility and efficiency. The convenience of the physician and patient are secondary to the foregoing factors. Speaking from a service point of view, I mentioned at a discussion on the Modern Treatment of Syphilis in the Laryngological Section of the Royal Society of Medicine, London, on Jan. 8th, 1909, "that I desired to speak in favour of the inunction treatment of syphilis which I had extensively practised for 15 years in the British army. This method was also in routine use in the French, German, Bavarian, Italian, Hungarian, Swedish, and Danish armies, and in many large civil clinics on the Continent, notably Unna's, Pontoppidan's, and at Wiesbaden and Aix-la-Chapelle. I admitted that it was not a convenient method for private practice, but I considered it ideal for public institutions in dealing with in-patients well-fed in hospital and under control in 'experienced' hands. Relapse is less frequent after thorough courses of inunction as contrasted with injections. There is more rapid reduction in the induration of the chancre and the lymphatic glands, whilst the increase in weight is greater in early syphilis."²⁶ The inunction method to my knowledge was extensively employed in London for

treating in-patients in the Foot Guards in the years 1895, 1896, and previously. Major Rayner of the Royal Horse Guards reports very favourably of it.²⁷

Dr. J. Donelan (London) states "that both at the Italian Hospital and in private practice he had carried out the inunction treatment of syphilis for the last 18 years in some 30-50 cases yearly. He was still in touch with some of these cases, some of which had begun treatment 20 years ago, and there were no recurrences amongst them. On the other hand, he had seen at the hospital a large number of waiters and others who had been treated by intramuscular injection of soluble salts of mercury in Italy, France, South America, and other countries for 6 to 12 months. These people had come to the hospital suffering from recurrence, often of a severe character, in a year or two from the cessation of treatment. He thought with forethought and obvious precaution it was quite practicable to carry out the inunction treatment in private practice."²⁸ Dr. Lieven (Aix-la-Chapelle), who read the important paper on the Modern Treatment of Syphilis at the Royal Society of Medicine meeting, stated: "In our country (Germany), owing to the many disadvantages, if not dangers, associated with injections, the majority of the profession prefer treatment by inunction. The teachings of Sigmund have made it clear that inunctions can be carried out without necessarily producing mercurialism. I admit that treatment by inunctions is difficult to conceal from the patient's surroundings, and that the cure is dirty and disagreeable, but in spite of this its advantages are so great that whenever I have asked a medical man in our country what kind of treatment he would prescribe for himself there was no one who did not reply—inunction."²⁹ Colonel Lambkin recently stated: "Inunction is the oldest known method of administering mercury and it has always been an enigma to me why England has not taken the example of Aix-la-Chapelle, for there during the last century and a half the inunction method has flourished in the most successful manner."³⁰ The inunction method of treating syphilis is very extensively and thoroughly carried out at Harrogate in England. The sulphur waters exist as at Aix; there are trained rubbers and every hydro-therapeutic requisite so essential for the adequate treatment of this disease. Owing to the foregoing reasons I consider that intramuscular injection of insoluble salts of mercury may possibly supplement but never supplant treatment by inunction methods where this latter excellent method is practicable in the early stages of syphilis.

I attach two tables showing important figures and facts from the Royal Herbert Hospital, Woolwich, where I have specially worked at this subject for the past four years. Both tables show that in the British army gonorrhœa apparently causes as much medical inefficiency in hospital as, if not more than, syphilis owing to the greater number of cases and the longer duration of stay in hospital.³¹

Table I. shows that in the years 1901-03 inclusive there is a much greater incidence of all classes of venereal diseases than in the years 1904-08. In the years 1901-03 the system of collecting venereal statistics throughout the army was inaccurate and misleading. This was later rectified in the year 1904, the term "primary" syphilis which included numerous errors of diagnosis being entirely done away with and only undoubted syphilis shown.³² The reduction of syphilis in the years 1905-08 is very marked. Further, the systematic out-patient attendance of syphilis cases began in 1904. This had not previously been in regular existence.³³ In 1905 the method of treating both syphilis in-patients and out-patients at Woolwich was by intramuscular injection of insoluble grey oil. A very large number of cases—namely, 54—were re-admitted to hospital for relapse, and they remained in hospital for very long periods as evidenced by the syphilis register. In October, 1905, the experiment was tried of treating all in-patients by inunctions of unguentum hydrargyri B.P. with daily baths, and out-patients ordinarily with intramuscular injections of standardised grey oil. This procedure was continued in the years 1906, 1907, and 1908, with excellent results, and, as previously explained, a very marked reduction in the relapse of syphilis ensued. In 1907 and 1908 the practice was further initiated of inspecting gonorrhœa cases for a month after discharge from hospital on the lines suggested in a former article.³⁴ This has effected a marked reduction in admissions for relapse, and in the number of cases of complications, such as

orchitis, arthritis, and stricture. As regards Table II., the strength of the garrison naturally varies with temporary movements of troops, but infected women remain. The "weekly" attendance roll is for out-patients under treatment or supervision in the first year of contracting syphilis. The "monthly" attendance roll is for out-patients over a year under treatment and waiting between courses of injections when they are again put back on to the "monthly"

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TABLE I.—Annual Statistics for Venereal Diseases amongst "Local" Troops (Woolwich).

Year.	Average daily strength of garrison.	All diseases admission ratio per 1000.	All venereal diseases admission ratio per 1000.	Syphilis.				Gonorrhœa.				Soft chancre.			
				Admissions (actual number).	Constantly sick.	Ratio per 1000.		Admissions (actual number).	Constantly sick.	Ratio per 1000.		Admissions (actual number).	Constantly sick.	Ratio per 1000.	
						Admissions.	Constantly sick.			Admissions.	Constantly sick.			Admissions.	Constantly sick.
1901 ...	6010	534.27	126.5	236	41.88	39.26	6.96	347	30.42	61.06	5.06	158	16.32	26.28	2.71
1902 ...	6020	521.09	307.64	379	32.87	62.95	5.46	1384	25.30	229.9	4.2	89	17.61	17.78	2.92
1903 ...	5484	529.18	161.56	477	54.38	86.97	9.11	325	28.27	59.24	5.15	84	6.34	15.31	1.15
1904 ...	5311	496.52	131.04	331	56.76	62.32	10.70	237	26.71	49.62	5.03	128	15.91	24.10	0.21
1905 ...	4966	489.12	85.17	202	30.30	41.49	6.14	167	20.61	33.83	4.23	56	6.18	11.27	1.24
1906 ...	5096	549.64	76.92	129	13.85	15.12	2.72	220	20.41	43.18	5.15	43	3.25	8.44	0.64
1907 ...	4702	596.76	80.6	87	12.79	18.50	2.71	195	29.16	41.45	6.18	97	10.98	10.63	2.33
1908 ...	5666	547.47	40.06	53	6.12	8.75	1.28	154	23	32.37	4.88	20	2.26	4.23	0.48

TABLE II.—Monthly Statistics from January to July, 1909 (Woolwich).

Month.	Average daily strength of garrison.	Average number of men constantly sick.				Syphilis register.							
		Syphilis.	Soft chancre.	Gonorrhœa.	Venereal sores awaiting diagnosis.	In hospital at end of month.	Monthly attendance.	Weekly attendance.	Total.	Placed on syphilis register first time.	Placed on syphilis register (transferred from other stations).	Struck off register on com- pletion of treatment.	Transferred to other stations or become ineffective.
January	6201	17.66	4.06	20.87	1.64	14	16	46	76	6	1	2	6
February	6021	12.0	2.75	26.14	2.03	10	23	47	80	5	2	—	3
March	5827	12.8	2.0	18.35	3.22	15	14	43	72	3	3	6	8
April ...	5340	9.93	0.83	17.06	2.83	10	23	48	81	5	5	—	1
May ...	4348	10.25	1.25	22.25	1.41	13	23	46	82	5	3	1	6
June ...	3860	16.07	—	16.57	1.33	11	24	52	87	10	1	—	6
July ...	3854	9.97	0.35	13.0	2.87	11	10	58	79	3	2	—	13

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THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—The sixty-eighth session of the School of Pharmacy will be opened at Bloomsbury-square on Sept. 29th at 3 o'clock, when the President will present the Hanbury gold medal to Professor Alexander Tschirch, of Bern University, who will deliver the inaugural sessional address.

PUBLIC HEALTH IN HASTINGS.—The quarterly report of Dr. A. Scarlyn Wilson, medical officer of health of Hastings, states that during the three months ended June 30th there were registered 131 births of males and 150 births of females, giving a birth-rate of only 16.5 per 1000 of the estimated population, a rate considerably less than in any earlier year at this season. The lowest previously recorded birth-rate was 17.3 per 1000 in 1908. The deaths recorded in the quarter numbered 210—namely, 82 of males and 128 of females. Included in this total were the deaths of seven non-parishioners, which being deducted there remained 203 deaths, yielding a death-rate for the quarter of only 11.9 per 1000 compared with 13.0 per 1000 last year. There were 17 deaths of infants under one year of age, being only 60 per 1000 of births and 84 per 1000 of all deaths. Deaths from the seven principal epidemic diseases were only three in number, and the zymotic death-rate was thus as low as 0.18 per 1000—the same as in the first quarter of the current year. Dr. Wilson remarks that from the Registrar-General's reports it appears that both in the whole year 1908, and in the first quarter of 1909, Hastings stood first among the 76 large towns of England in the low rate of its zymotic mortality.

roll. This works well with commanding officers and men. The figures for the year 1902, just after the South African war, are very high and would appear to show the need in large garrisons for legislative action on the lines in vogue in India (Cantonment Act, October, 1897) where, as explained in the body of this article, an enormous reduction of disease has been effected since 1897. In England the Contagious Diseases Acts, 1864, 1866, and 1869 are not repealed but only in abeyance, I trust temporarily, and hope that they will be remodelled on the lines of India. The foregoing figures for one station (Woolwich) refer to soldiers under effective control whilst civilians are not. There is just as much, if not more, venereal diseases amongst the civil population, but as no records are kept naturally the Army appears more *en évidence*, as pointed out in Dr. Pernet's paper, quite apart from the fact "that single men in barracks are not plaster saints" (Rudyard Kipling). If the underlying principles of accurate record, systematised treatment, and notification were adequately recognised and fully acted upon in civil communities (as in the Army) a large amount of preventable disease and suffering amongst innocent women and children would be obviated, the excessive expenditure on hospitals, insane asylums, and prisons would be appreciably lessened, crime reduced, and more money find its way into the State coffers.