2. Complete excision of a wound leaving an aseptic surface is possible only in superficial wounds and in superficial muscular wounds. It is impracticable in deep penetrating wounds, compound fractures, etc., on anatomical grounds, and it would also entail a much freer removal of tissue, which may impair future functional result. These latter cases, when treated by soap solution and primary suture, heal better than if an antiseptic such as eusol or bipp had been used. It follows from this that the tissues themselves are able to deal successfully with any infection which is left behind without the aid of any antiseptic. This point is particularly exemplified by those cases in which there is at first an intense local reaction following on the operation; it subsides as the tissues gain the upper hand.

3. Success depends on getting cases within a few hours of being wounded, before infective processes have spread far into the adjacent muscles, on the thorough removal of dead or grossly damaged tissues, and on the localization by *x* rays and removal of any foreign body that may be present.

4. Compound fractures of the upper extremity practically always do well; only three cases of fracture of the femur have been thus treated, and of these two were successful, but the number is too small to warrant a definite opinion. It is necessarily the most severe type of case one has to deal with, but the results of those cases have been distinctly encouraging.

5. The advantages of primary suture are obvious: (a) Easy, rapid, and painless dressings; (b) time is saved for everybody once the patient has left the operating theatre; (c) it is economical. The time taken in the operating theatre is, however, considerably longer, and this generally forbids the use of the method when the pressure of work is high.

6. One of the most important points is that no severe injury which has been stitched up should be evacuated for at least a week—first, because movement may just turn the balance during the early days of local reaction when the tissues are getting the upper hand and cause failure, and, secondly, because when it is very difficult to decide whether the case should be opened up or not the operator himself is in a much better position to judge what is likely to be taking place inside the wound he has sewn up than some one else who gets the case later; consequently stitches remain in which may otherwise be taken out perhaps through no fault of any one.

7. No opinion can be given as to the ultimate functional result as to bony union and action of muscles.

In those cases in which primary suture has been out of the question owing to gross loss of tissue, after the usual operative procedure I have used a soap pack after the manner of the salt pack. It has been left in as a rule for five to seven days, and when taken out left a beautifully healthy wound.

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A SEROLOGICAL INVESTIGATION OF VINCENT'S ANGINA.

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INFECTIVE disorders of the pharynx include a great variety of different conditions—ulcerative, membranous, ulcero-membranous, and septic—due to different micro-organisms, so that for their accurate differential diagnosis careful bacteriological investigations are necessary.

The nature of these investigations will depend on the clinical appearance which the lesions present. Thus, in membranous inflammations cultures on Loeffler's blood

serum would reveal the presence or absence of the Klebs-Loeffler bacillus; in ulcero-membranous conditions the microscopic examination of properly prepared stained films would show the spirochaete and *B. fusiformis* of Vincent; a positive Wassermann reaction would prove the nature of ulcerative conditions to be syphilitic, whilst cultures and films showing streptococci and staphylococci would be obtained in pyogenic infections.

The value of the Wassermann reaction in the differentiation of these various conditions cannot be denied, being positive in syphilitic affections of the pharynx and negative in all others, with the exception of the angina of scarlet fever, which presents sufficiently characteristic symptoms not to lead to confusion, and is not further considered here.

This opinion, however, which is based on the careful bacteriological examination of several hundred cases of sore throat at the Queen Alexandra Military Hospital, is quite at variance with the views expressed in several contributions scattered through the literature of the subject, in which it is maintained that in uncomplicated cases of Vincent's angina the Wassermann reaction is often found to be positive. Thus, StClair Thomson¹ states that—

From syphilis the differentiation—(of Vincent's angina)—is . . . difficult, as both fusiform bacilli and spirilla may be found in a cover-glass preparation from a tertiary ulcer, and also because, apart from concomitant syphilis, the Wassermann reaction may be positive. In more than one case I have seen a suspected Vincent's angina reveal its true nature by the evolution of a coppery rash or other specific stigmata.

The value of this statement is largely invalidated by the vagueness of the diagnosis of the Vincent's angina which was merely suspected. The diagnosis should, of course, have been definitely made by bacteriological examination. Still, allowing that the cases were really Vincent's angina, they would merely confirm Sobernheim's and Weinstein's findings that syphilitic and fuso-spirillary pharyngitis may coexist, and support our own conclusions that Vincent's angina may occur in subjects with latent syphilis. Bowman,² again, considers "that the disease may be confused with syphilis, and Vincent's angina may be superimposed upon a syphilitic or diphtheritic infection of the mouth and throat." Nevertheless, he found that the Wassermann reaction had always been negative in the uncomplicated cases of Vincent's angina seen by him.

Bouty³ also, describing his experiences of Vincent's angina among the troops in France during the last two years, states that "the Wassermann reaction in Vincent's angina is negative," but the evidence upon which this statement is made is not given. This agrees with the findings of Campbell and Dyas,⁴ who state that "a positive Wassermann reaction does not exclude Vincent's angina, nor does the fact that a mouth lesion clears up quickly under arsenic exclude syphilis." In cases of Vincent's angina with no syphilitic history, however, the Wassermann reaction is always negative.

Ehrlich⁵ in 1910 called attention to the value of intravenous injections of salvarsan in Vincent's angina, and recorded the rapid healing within a few days of the lesions of this disease. Gerber⁶ in the same year described a case successfully treated in this way, stating that the Wassermann reaction was weakly positive, and that he had also found it so in a previous case; he considered, therefore, that he could not definitely exclude syphilitic infection. Gerber⁷ also quotes Much as having obtained positive Wassermann reactions in this condition. Much's⁸ own statement made in 1908 is that in one other case of Plaut-Vincent's angina multitudes of non-specific spirochaetes were found in the tonsil. Lues was excluded, but on what grounds is not stated. The examination of the blood by the complement fixation method, which was undertaken during the febrile stage of the disease, gave a strongly positive reaction. Fourteen days afterwards, when the patient had recovered from the angina, the reaction was found to be negative.

Sobernheim's⁹ name is constantly encountered in the literature of the subject as supplying the most definite evidence of the finding of a positive Wassermann reaction in Vincent's angina. His evidence rests solely on three cases, and a critical examination of these shows the flimsy basis on which his statement rests.

In the first case the patient presented the symptoms of secondary syphilis—typical exanthem, anal condylomata, and mucous plaques on the tonsil. While antisyphilitic treatment was being carried out a deep greyish-yellow coated ulcer, with

all the characteristics of Vincent's angina, developed. *B. fusiformis*, *Spirochaeta vincenti*, and *Spirochaeta pallida* were observed by dark-ground illumination. Antisyphilitic treatment was suspended, serological examination of the blood gave a positive result, and after some days the ulcer healed spontaneously.

The second case was a youth of 17, who complained of pain in the neck and difficulty in swallowing. The left tonsil was red and swollen, its upper pole being covered with a smeary exudation. The cervical glands were enlarged, but not tender. In stained film preparations *B. fusiformis* and spirochaetes were present in enormous numbers, and the diagnosis of Vincent's angina was made. The Wassermann reaction was completely positive. Potassium chlorate lotions were ordered, and healing was complete in eight days.

The third case was a young woman of 18, in whom the diagnosis of Vincent's angina was made from the condition of the tonsil and the whole course of the illness. The Wassermann reaction was negative. A few days later an ulcer of the tonsil appeared, which rapidly cleared up without specific treatment. Mucous plaques developed later on both tonsils, and the patient was then placed on antisyphilitic treatment.

Sobernheim concludes that great caution must be exercised in applying the Wassermann reaction to the differential diagnosis of lues and Vincent's angina.

In the first and third of these cases it is obvious that the syphilis and the Vincent's angina were merely concurrent infections, and that in the second case latent syphilis, either congenital or acquired, could not be excluded with certainty.

Weinstein,¹⁰ in discussing the value of the Wassermann reaction in rhino-laryngological practice, stated that in cases of Vincent's angina the ulceration of the tonsil may sometimes appear to be syphilitic, and that neither the clinical appearances nor the microscopic findings are sufficient to establish a definite diagnosis with certainty. In such cases he states that he employed the Wassermann reaction with good results, and gives his experience of four cases:

A woman of 24, suspected to being syphilitic, presented the typical appearances of Vincent's angina, with an immense number of fusiform bacilli and *Spirochaeta buccalis*. The Wassermann sero-diagnostic test was completely negative. In two other persons suffering from Vincent's angina, with the characteristic micro-organisms present, a history suggestive of syphilis was obtained, and was confirmed in both cases by the Wassermann reaction. In the fourth case of angina with a doubtful syphilitic history, in which *B. fusiformis*, *Spirochaeta buccalis*, and *Spirochaeta dentium* were present in large numbers, the sero-diagnostic test was negative.

Saverio,¹¹ discussing Vincent's angina and syphilis, considers from the cases cited above that the presence of numerous Vincent organisms in the exudation of cases of angina does not as a necessary consequence produce any deviation of complement, and that until such important problems have received sufficient light new parallel studies must be made—on the one hand to establish the pathogenic value of the spirochaetes commonly found in Vincent's angina, and, on the other hand, to accumulate sufficiently numerous cases of similar forms of angina in which the sero-diagnosis has been made. If a certain diagnosis cannot be made, he holds that the hypothesis of Vincent's angina in syphilitic subjects is the most probable.

It is to the latter suggestion of Saverio's that we have directed our attention. At the Queen Alexandra Military Hospital we have recently had occasion to examine bacteriologically more than 300 cases of fuso-spirillary infection, and about half this number were typical cases of Vincent's angina verified by bacteriological findings.^{12 13} From this number we have taken at random, and with no more selection than mere convenience demanded, 55 cases, and had the blood tested by the Wassermann reaction, performed either by one of us (F. E. T.) by the method recently described,¹⁴ or at the laboratories of the Rochester Row Military Hospital.

In all of these cases, with but two exceptions, no fixation of complement could be observed. The histories of these two cases, in which a positive Wassermann reaction was obtained, are as follows:

CASE I.

Pte. G., Australian Imperial Force, attended the laboratory on December 14th, 1916, for a sore throat which had troubled him for a week. A superficial ulcer was seen on the right tonsil, and the margins of both upper and lower gums were ulcerated and covered with a soft, creamy exudate. The lymphatic glands at the right angle of the jaw were swollen and tender. The ulcers on the tonsil and gums bled when touched lightly, and smears from these parts showed numerous fusiform

bacilli and spirochaetes. The gums and tonsil were treated daily and by December 20th the latter was quite healed. The patient continued to attend for treatment of his gums, and on December 24th a sluggish-looking ulcer was noticed on his left tonsil. Smears from this ulcer presented microscopically a typical picture of the organisms of Vincent's angina, but it was noticed that the glands at the angle of the jaw were not enlarged and the ulcer did not bleed when touched. The Wassermann reaction was positive. On cross-examination the patient admitted that he had contracted syphilis in Australia, having had a primary chancre ten years previously for which he was treated successfully; he remained free from secondary symptoms and had had no further syphilitic manifestations up to date.

CASE II.

Pte. J., Australian Imperial Force, attended for a sore throat which had troubled him for a month. There was a deep ulcer filled with a yellowish-white exudate on the left tonsil, and the upper and lower gums were ulcerated. The ulcers on the tonsil and gums bled when lightly touched, and smears when examined microscopically showed the usual picture of the organisms of Vincent's angina. The lymphatic glands at the left angle of the jaw were enlarged and tender. As we were making a serological investigation of Vincent's angina at this time a sample of the patient's blood was taken for examination and gave a positive Wassermann reaction. The result was communicated and explained to the patient, who then admitted having had a chancre ten years ago, when he was treated by a herbalist for three months with medicine and ointment for the sore. No secondary or further symptoms of the disease had been noticed. He was married, but had had no children. The throat and gums were treated on the lines we had adopted for fuso-spirillary ulcerations. The throat had healed in a week, and the gums about three weeks later. This case, from its clinical characteristics and microscopical findings, was obviously one of fuso-spirillary ulceration in a subject with latent syphilis.

These two cases, then, were the only ones out of a total of 55 cases of Vincent's angina examined by the Wassermann test in which the reaction was positive; the remaining 53 cases were quite negative. The positive character of the reaction in the two cases admits of a ready explanation, and was not due to the fuso spirillary infection of Vincent. In both cases the condition was one of Vincent's angina in a subject of latent syphilis.

As a result of this investigation and of a careful and critical consideration of cases recorded in the literature we have come to the conclusion that the prevailing belief in the occurrence of a positive Wassermann reaction in Vincent's angina has no foundation in fact, and that the two conditions can be differentiated with absolute certainty by the application of bacteriological and serological methods; and that when the complement-fixation test of Wassermann is positive in cases of Vincent's angina, then a double infection exists, either as a coincident syphilitic and Vincent's infection or as the occurrence of Vincent's angina in the subject of latent syphilis.

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A PREPARATORY institution for the school of naval medicine has been established temporarily in connexion with the University of Bordeaux. Its object is to give the first year of medical training to young men intending to adopt the career of naval or colonial surgeon.

THE French Food Minister, M. Victor Boret, who worked in maltings and in a shipbroker's office in this country before joining his father as a corn merchant in France, takes a sanguine view of the food position of that country. There is, he says, enough meat, potatoes, and corn, except oats, if there is no waste. In Germany there is, he believes, a total want of fats, oil, tea and coffee, and so great a shortage of foods that the people are underfed. There has recently been some difficulty about bread in Paris, owing to transport delays due to the bad weather and severe snowstorms, but arrangements have been made which it is believed will ensure an even distribution of flour among the bakers.