or so it is resting on the face. I then replace it by the ether mask and quickly drop on ether till the lint is saturated. Next I place a towel, two or three folds, over the mask to increase the concentration, leaving sufficient space to apply the anaesthetic continuously. By this method I rarely get any struggling and often not the slightest movement on the part of the patient, who is generally ready for the operator in three or four minutes. This ensures the maximum degree of safety, is certainly very quick, and preferable to beginning with ether alone. Patients all agree that the chloroform is pleasanter and less irritating. For instance, it is quite the rule for those men who have had both anaesthetics to tell me that they prefer chloroform. The average quantity of anaesthetic for an operation of half an hour is 2 drachms of chloroform, 3 oz. of ether. Occasionally it is very difficult to keep some of these young subjects under with the ether drop method alone, especially in abdominal cases, and it may be necessary to resort to a little chloroform or C.E. mixture for a short time and then resume the ether.

In my private and previous hospital experience I have administered nearly three thousand anaesthetics, the bulk by the method outlined, and have not had one fatal case or any serious difficulty.

In my early days I was taught to give ether by the Clover method, but now rarely use it, for to my mind the ether drop method is very much better, in that the patients very rarely get cyanosed, have less trouble with mucus, a quieter anaesthesia, and less sickness after the operation.

I have also introduced a Shipway's warm ether apparatus, and, in conjunction with my own methods, find it very useful in cases requiring prolonged administration, in that it conserves the body heat of the patient, and is also a saving of the anaesthetic.

Ethyl chloride and nitrous oxide have proved quite satisfactory for patients requiring a short anaesthesia such as for incisions and manipulation of joints.

I find, after giving anaesthetics daily in a military hospital, that it is quite different from administering them in a general hospital in peace. In the latter it is the exception to have a strong, healthy young man to anaesthetize, the majority of cases being women and children or men usually with a definite organic or inflammatory lesion and often well prepared for an operation. Military cases are frequently robust young men who have lived an outdoor life for varying periods and many of them have been in the trenches and subject to war strain and nervous exhaustion. I have also found that men suffering from shell shock require much more anaesthetic than other men and have a greater tendency to excitement whilst going under. In these cases a little encouraging suggestion during the first stage of anaesthesia not only helps during the administration, but is also beneficial afterwards. At first I was inclined to attribute this to the mode of living, which made them difficult to anaesthetize, but I am now convinced there is a nervous element to contend with. It is impossible in many cases to judge by the appearance of the men how they are likely to behave under an anaesthetic. Some of the apparently quiet and sickly-looking men take a large quantity of anaesthetic and become troublesome with excitement, whereas some of the rough-looking and vigorous need very little.

In a short note Marcus W. Lyon (*Anatomical Record*, Philadelphia, 1917, xiii) records the case of a woman, aged 41 years, whose right kidney was absent, the left being hypertrophied. The right ureter was connected with the urinary bladder and contained a little calcareous debris. The adrenals on both sides were in their normal positions. There was only one Fallopian tube and one ovary. The interest of the case is that the patient's maternal grandmother had been operated upon for some abdominal condition and that one kidney—it is not stated which—was found to be absent.

SURGEON B. J. LLOYD, of the United States Public Health Service, sanitary inspector under the Bureau of Medicine, in a recent report states that at Bremerton, Washington, where the Paget Sound navy yard is situated, and at Seattle, the neighbourhood swarms with prostitutes from all parts of the country. He recommends that the Navy Department should procure the enactment of a law declaring a general district, one hundred miles in diameter, surrounding every military and naval reservation. From this all undesirable persons should be excluded, and the most objectionable should be interned.

ON THE TREATMENT OF GUNSHOT WOUNDS WITH A SOLUTION OF SOAP AND WATER AND PRIMARY SUTURE.

BY

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At the suggestion of Colonel Cuthbert Wallace, consulting surgeon to our army, I commenced treating as many gunshot wounds as possible by primary suture, using instead of an antiseptic a solution of soap and water.

The solution used has been of the strength 1 in 40. Pure *sapo durus* (1 part), obtained in blocks, is cut into shavings and dissolved in hot water (20 parts) which has been previously boiled. When required for use the solution is mixed with an equal volume of sterile water.

OPERATIVE TECHNIQUE.

Superficial Wounds.

Superficial wounds are completely excised and soap solution well rubbed into the surface; they are then stitched up.

Single Penetrating Wounds.

The skin wound is completely excised, the exposed surface of the wound in the muscle cut away, and the track of the missile laid thoroughly open. The wound being held widely open with retractors, the surface of the track is cut away all round, *from the inside*, with scissors until all damaged muscle, as far as it is visible to the naked eye, is removed. Foreign bodies, clothing, or any small, loose fragments of bone, are removed, all bleeding points ligatured, and the whole wound thoroughly swabbed out with soap solution. Muscles and fasciae are closed with catgut and the skin sutured.

If the metal has passed almost through the thickness of a limb, it is removed by a counter incision and the wound converted into a seton wound.

Seton Wounds.

Both entrance and exit wounds are treated as above, and it is generally possible in this manner to expose and excise the whole track, one half from each incision. In cases in which this has been impossible for anatomical reasons the centre of the track has been well rubbed with gauze and soap.

If it only involved the division of a thin layer of muscle, the entrance and exit wounds were directly connected, laying open freely the whole track, which could then be dealt with. If there is gross loss of muscular tissue so that the ends cannot be approximated, or if a large dead space is left, the skin is sutured over the wound and a very small split rubber tube introduced for twenty-four to forty-eight hours.

In cases in which it is difficult to approximate the skin edges without undue tension one or more incisions may be made down to the deep fascia parallel to and at some distance from the wound. This occurs most often in the forearm and lower part of the leg.

Amputations.

Amputations have been completely stitched up with a very small split tube introduced into one corner for twenty-four hours. Penetrating wounds of knee-joints have been completely excised down to the synovial membrane, the joint well irrigated with soap solution, and the wound closed in layers.

Effect of the Soap Solution.

The effect of the soap solution on the wound appears to be haemostatic. Instruments, needles, etc., tend to become somewhat slippery—a slight disadvantage.

RESULTS.

During the last four months all cases in which it was possible have been treated by this method, but during one period of pressure it was impossible.

Patients have been kept on an average for ten days and then evacuated by barge to one general hospital, where they have been seen by Colonel Cuthbert Wallace, and reports on progress have been given to me by him and sent by the medical officers of that hospital.

CHART 1.—o, Operation. s, All stitches removed.

CHART 3.—o, Operation. s, All stitches removed.

CHART 2.—o, Operation. s, All stitches removed.

CHART 4.—o, Operation. R, One stitch removed. s, All stitches removed.

In this way it has been possible to follow the early history of all patients except a few who were unavoidably lost sight of during the period of pressure. The total number of cases was 116.

	No. of Cases.	Healed.	Healed after Superficial Suppuration.	Failed.	Result Unknown.
Wounds superficial to muscle	5	3	0	0	2
Deep flesh wounds ...	59	37	11	3	8
Compound fractures	38	28	5	2	3
Amputations ...	6	4	0	0	2
Knee-joints ...	8	3	0	2	3
Total ...	116	75	16	7	18

The compound fractures consisted of the following cases:

	No. of Cases.	Healed.	Healed after Superficial Suppuration.	Failed.	Result Unknown.
Femur ...	4*	2*	1	1	0
Tibia and fibula ...	1	1	0	0	0
Tibia ...	3	2	0	0	1
Fibula ...	1	1	0	0	0
Humerus ...	17	13	2	0	2
Radius and ulna ...	1	1	0	0	0
Radius ...	5	4	1	0	0
Ulna ...	6	4	1	1	0
Total ...	38	28	5	2	3

* One case was a partial fracture in which a piece of shell had passed through the shaft of the femur about the middle without producing complete fracture.

Out of a total of 98 cases in which the result was observed 91 eventually healed and 7 failed altogether.

Out of 38 cases of compound fracture, 33 eventually healed and 2 failed.

A considerable proportion of cases healed dry without any discharge. In some there was a little oozing or slight superficial suppuration, necessitating removal of one or two stitches before they healed.

A few cases became very swollen, red and shiny, about the second day, simulating acute cellulitis. The temperature rose to 102.3°, but the pulse as a rule remained below 100. After a day or two the swelling began to subside, redness disappeared, and the skin became crinkled, due to diminution of subcutaneous oedema. These cases may cause alarm at first, but it is rarely necessary to remove any stitches. The pulse-rate appears to be the best guide.

In some cases in which the wound was gangrenous before operation a brownish discoloration appeared around the wound, and the part might even become tympanitic. On removal of one or two stitches gas and offensive discharge escaped, and the infection as a rule subsided.

Four temperature charts are appended. Chart 1, a case of excision of elbow-joint; and Chart 2, an amputation of leg, followed a perfectly normal course and healed by first intention.

Chart 3 was a case of compound fracture of humerus with an opening into the elbow-joint. On the second day the whole elbow was very red, swollen, and shiny in appearance. It all subsided, and the wound healed by first intention.

Chart 4 shows a case of compound fracture of the femur. It was a severe fracture, with a large exit wound, in order to close which tension incisions had to be made. For the first six days his temperature rose at night and the pulse-rate caused apprehension, but on removal of one stitch on the sixth day, evacuating a small collection of turbid fluid under the skin, it gradually subsided and the wound healed.

CONCLUSIONS.

1. Soap solution easily permeates and comes into contact with the whole surface of the wound. It acts as a mechanical cleansing agent, washing away all debris.

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.

BY

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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