The doses for C and D were mixed with the respective serums and allowed to stand at room temperature for thirty minutes before injection.

A showed severe illness and considerable swelling of the thigh in four hours, and died within twelve hours.

B, Thigh very much swollen in six hours; the animal died during the night.

C showed no effects whatever of inoculation.

D, Thigh very much swollen in six hours; the animal died during the night.

The conclusion drawn was that $\frac{1}{4}$ c.cm. of anti-*oedematis* serum mixed with 1 c.cm. of culture thirty minutes before injection had prevented the infection of the animal.

The post-mortem appearances in A, B, and D were identical. At the site of inoculation the thigh muscles were dark, haemorrhagic, slightly fetid, and gangrenous, and were separated from the skin by a dense gelatinous blood-stained oedema. A similar oedema, but clear and not blood stained, spread from the thigh over the abdomen and thorax. When incised, the oedema was sufficiently firm to remain solid, without any outflowing of fluid or alteration in consistency. A minute quantity of gas bubbles was present at the spreading edge of the oedema and in the depths of the gangrenous muscle, but very small in amount compared with the oedema produced. Close to the site of inoculation and in the gangrenous muscle the curved Gram-positive sporing bacilli were present, but in preparations made from the oedema at a distance from the wound they were rarely detected.

In all the features of morphology, cultural character, auto-agglutination, and serum tests, the organism conformed to the description given by Weinberg and Séguin of *B. oedematis*.³ Cultures were sent to Dr. Weinberg at the Pasteur Institute for examination, and were pronounced by him to be identical with the *B. oedematis* of Weinberg and Séguin.

During September a similar organism was observed in five other cases, but was not isolated in pure culture. The difficulty in isolating the bacillus is associated with the necessity for a very strict anaërobiosis, which can be effectively provided by the following method employed at the Pasteur Institute for anaërobic cultivation in fluid media. The test tube containing fluid medium is inoculated and is then heated above the level of the fluid and drawn out into a thin neck. The mouth of the tube is unaltered, and the cotton-wool plug is pushed down towards the constriction and the tube attached to a pump and exhausted. During the process of exhaustion gentle heating of the fluid drives out all air dissolved in the liquid, and the tube is then sealed by Bunsen flame at the constricted neck, and is ready for incubation.

Clinically *B. oedematis* appears to be associated with a specially severe form of gas gangrene, characterized by acute general intoxication and extensive spreading solid oedema, with little gas formation other than that due to associated organisms in the neighbourhood of the wound. It is probable that a close search under conditions of satisfactory anaërobiosis would demonstrate its presence in many cases of gas gangrene.

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NOTES ON SOME RECENT CASES OF DYSENTERY.

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DURING the months of December, 1916, and January, 1917, a good many convalescent cases of dysentery were admitted from France to the 2nd Southern General Hospital, and of these eighty have been under my care. All these cases were transferred with a diagnosis of "dysentery," and with many of them short accounts of the phenomena which occurred overseas were also sent. From these and the histories given by the men themselves the phenomena appear to have been fairly uniform in character. There was a sudden onset of the frequent passage of blood and mucus per rectum, with tenesmus, frequently preceded for a few hours and generally accompanied by abdominal pain and tenderness. This gradually

lessened under treatment, and in most cases subsided in about a fortnight. The disease, with very few exceptions, appears to have occurred in the Somme district, and the eighty cases came from sixty-five separate units.

Examination of the blood by Professor Walker Hall for agglutinins of typhoid, paratyphoid A, and paratyphoid B gave the following results:

- Class I. Agglutinins for all three diseases were present in 46 cases = 57.5 per cent.
- " II. Agglutinins for typhoid only were present in 23 cases = 28.7 per cent.
- " III. Agglutinins for typhoid and paratyphoid A were present in 6 cases = 7.5 per cent.
- " IV. Agglutinins for typhoid and paratyphoid B were present in 4 cases = 5 per cent.
- " V. No agglutinins for these diseases in one case = 1.2 per cent.

Of the 23 men in Class II, 9 were inoculated in 1914 or 1915; the remaining 14 were inoculated in 1916, and of these 8 quite definitely with T.A.B.; of the 6 men in Class III, all had quite definitely been inoculated with T.A.B. in 1916.

Of the 4 men in Class IV, 3 had been inoculated with T., and only one with T.A.B.

The man with no agglutinins in his blood stated that he had not been inoculated.

These facts show that agglutinins for paratyphoid A and B disappear from the blood much more quickly than do those for typhoid, and in some cases within a year.

Three of the four men in Class IV, who were inoculated with T. only, must have become infected with paratyphoid B during their service. This conclusion would throw doubt on a supposition that in the case of the six men in Class III agglutinins for paratyphoid B had disappeared from the blood, whilst those for paratyphoid A persisted. It is equally probable that in the case of these men agglutinins for both A and B disappeared from the blood and that they had subsequently suffered from an infection with paratyphoid A.

It follows from the above that of eighty men who were invalided with dysentery, three had previously been infected with paratyphoid B, and possibly six with paratyphoid A. Questions were asked of these men, but all declared that they had had good health previous to suffering from dysentery.

Many men are transferred to England with a diagnosis of P.U.O. (pyrexia of unknown origin), and bring with them temperature charts showing a simple fever of from seven to ten days. Some of these show agglutinins for typhoid and paratyphoid A or paratyphoid B in the blood, and have been inoculated previous to 1916. It is therefore probable that, as in the case of typhoid, paratyphoid A and B may be of all degrees of severity, varying from a malady which escapes attention, through cases of short fevers with no distinctive signs, to the easily recognized typical diseases.

Although no carriers of paratyphoid A or B have been detected among these cases of dysentery, or among those of P.U.O., this was always a possibility, and was guarded against by examination of faeces and blood.

Direct or indirect evidence of the cause of the dysentery was found in fourteen cases = 17 per cent. In three cases *Amoeba histolytica* was found—none of these had served abroad, except in France. In eleven cases the cause was bacillary—in three *B. dysenteriae* (Flexner) was found at the 2nd Southern General Hospital, although the blood showed no agglutinins for this organism; in four cases *B. dysenteriae* (Flexner) was stated to have been present in France, and in one of these the blood showed agglutinins for this organism at the 2nd Southern General Hospital; in one case *B. dysenteriae* (Flexner and Shiga), in another *B. dysenteriae* (Y), and in another agglutinins for *B. dysenteriae* (Y) were found in France.

These results show that agglutinins are not necessarily present in the blood in cases of infection by these dysentery-causing organisms, so that their absence does not negative a bacillary cause. Further, they suggest that antidysenteric serum might be used with good effects in the majority of these cases in the early stages.

The occurrence of these cases—both amoebic and bacillary—in France is probably to be explained in the transference there from the East of men who were undetected carriers. Thus six out of the eighty men had served at the Dardanelles, and of these four had been invalided thence with dysentery.

These convalescent cases after arrival in England showed but little trace of their previous illness. Most had

lost a stone or so in weight and were weak. Very few had any diarrhoea, and in those in which it did occur bismuth carbonate in teaspoonful doses was most useful. In this there was a marked contrast to the cases of amoebic dysentery in 1915, where a chronic or relapsing diarrhoea was a common feature. I found lactic acid fermented milk acted very well in these cases of post-dysenteric diarrhoea without any specific pathogenic organisms in the stools. *Amoeba histolytica* disappeared from the stools of the three cases of amoebic dysentery after ten days' administration of bismuth and emetine iodide. Each dose was preceded, half an hour before, by ten drops of chlorodyne. This was found to prevent nausea and vomiting.

Most men complained of constant pain in the back and bones of the legs, in some for a time so severe as to prevent sleep. This pain was unaccompanied by abnormal physical signs. There were no cases of arthritis in these cases from France.

Quite half the men had some tachycardia, with a rate of from 80 to 110. It gradually subsided with rest in bed. Digitalis slowed the rate to normal in many of these in a most marked way.

One man had incontinence of urine, with *Streptococcus faecalis* and *B. coli* in the urine. This cleared up on administration of hexamine.

The above evidence suggests the following conclusions. There are a large number of men serving in France—possibly a third of the number—who are unprotected against paratyphoid A and B, either by inoculation having taken place previous to 1916 or owing to disappearance of agglutinins for these diseases. These men are liable to become infected. It is advisable that inoculation or reinoculation with A and B be done once a year.

The importance of a pure water supply, where this is possible, is emphasized by the occurrence of dysentery, both amoebic and bacillary, in France. Such cases are likely to increase in numbers during the coming summer.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

THE TREATMENT OF PUERPERAL SEPSIS BY THE CARREL-DAKIN METHOD.

DURING my period of service in France I was much impressed by the success attained in the treatment of large septic wounds by the Carrel-Dakin method, and it occurred to me that a similar kind of treatment would probably be useful in many cases of puerperal sepsis. A tube or tubes of suitable length could be introduced into the uterine cavity, and once they were in position it would only be necessary for the nurse to undo the clips, and inject an appropriate quantity of Dakin's solution every hour or two hours. The only disturbance of the patient would be that required for the introduction of the tubes. The subsequent treatment could then proceed with the minimum of discomfort to the patient and without any manipulation of the uterus.

I am convinced that in this method we have the possibility of a great advance in the treatment of a condition which has hitherto baffled medical and surgical resources.

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TREATMENT OF INFANTILE CEREBRAL DIPLEGIA.

THE fundamental fact of the symptomatology of this disease is the spasticity of the muscle. From this condition it follows that any attempt of the person to perform an act results in excessive muscular contraction. Normally the act of attention is followed by mild contractions of the muscles of the face; in this disease it is followed by excessive contractions that produce the familiar staring mask-like appearance. In walking, moving the arms, or in speaking every muscle is thrown into violent contraction. To control these excessive contractions and keep them from being utterly irregular certain muscles must be trained to counteract each of the overacting ones—that

is, the co-ordinating centres of the nervous system (taxic centres) are to be trained to counteract the irregular effects of spasticity. If by "hypertonia" we indicate the spasticity itself, then "anatonia" may be used to designate the efforts of the nervous system to control the spasticity. Up to the present time all the methods designed to teach these people to walk and control their arms have consisted in exercises in which they are taught to try hard to control the jerkiness of the movements.

This disease may be conveniently studied in its effects on speech. Inscriptions of speech made by a recording apparatus show that all the sounds are over-enunciated, that the tone from the larynx is almost absolutely monotonous, that the breath is held under great pressure, etc. The work on speech has suggested a method of treatment that has proved highly successful. In this disease any effort of will of normal strength is followed by muscular contractions of abnormal force; therefore it follows that milder muscular contractions may be obtained by weaker acts of will. The patient should be trained to speak and act gently, as if he did not care to make any effort at all. The result is a weaker muscular action. In a very short time he learns to restrain his impulses, as if he meant to speak in a "don't care" manner. The result becomes normal speech. The same method is extended to walking and the use of the arms. "Try not to try" is the instruction. In every act the patient carefully refrains from any mental effort, and the spastic muscles are aroused only by weak impulses. Special co-ordinating exercises are unnecessary; are, in fact, injurious. The patient learns to walk and speak by special training in graceful, easy, and relaxed movements under skilful care. The results by this method are quick and permanent.

London, W.

E. W. SCRIPTURE, M.D.

SCIRRHUS CANCER OF THE OVARY AT THE AGE OF 15.

On January 2nd, 1917, in consultation with Dr. Percy Elliott, of Walthamstow, I saw a young lady with a solid abdominal tumour. She was 15 years of age, was menstruating regularly and as usual. Six days before I saw her she had complained of rather severe pain in the lower abdomen and back, but more especially in the back, and pain with a more or less constant feeling of sickness, and occasional attacks of sickness, had been troublesome symptoms ever since. When Dr. Elliott saw her he detected an abdominal swelling in the hypogastrium, and to eliminate the question of a distended bladder he very advisedly passed a catheter. When I saw her the tumour, which extended from the pelvis to within an inch of the umbilicus, was pushing the anterior abdominal wall slightly forward. It was central in position, fairly regular in outline, and everywhere hard. Both flanks were resonant. On rectal examination a portion of the swelling was felt in the right pelvis.

The patient herself—being a mere child—was unable to throw any light upon the question as to how long the growth had probably existed as an abdominal swelling.

The growth, when removed by me four days after I first saw her, was a solid tumour of the left ovary. It was of the size of an average male adult head. The pedicle was extra thick and extra vascular. The right ovary appeared quite healthy, and was consequently not disturbed.

Dr. Trevor Davies, who examined the tumour microscopically, pronounced it scirrhous.

London, W.

JAMES OLIVER, M.D., F.R.S. Edin.

CASE OF QUINTUPLETS.

Mrs. C., aged 39, when I first saw her on January 4th, 1917, was complaining of shortness of breath, persistent vomiting, a lump rising and falling in her throat which was choking her, and pain of a dull gnawing character in her side.

History.—She was eight months pregnant, had suffered a good deal the whole time with vomiting, was very nervous, and slept badly. She had no piles, but complained of her feet being swollen more than usual. She had seven children, all living; no miscarriages. Her previous confinements had been all quite normal, of an average duration of five to six hours. No previous twins or triplets.