has ceased. These fascial grafts are quite as good as muscle for wounds of the cranial surface of the sinus, which are the only ones likely to be met with in civil practice, and they have the advantage of being cut quickly and without leaving the field of operation. That these grafts stick extremely firmly I know from the examination of two fatal cases at *post mortem*.

If, however, the rent runs round the corner on to a cerebral surface of the sinus it is difficult to get fascial grafts to stick, and they usually require a reinforcing stitch which is not always easy to apply. In such cases a "plug" of muscle is the most satisfactory method of arresting haemorrhage, for the muscle graft with its power of causing rapid clotting holds more quickly. Where the sinus has been torn almost across, it is best to divide it completely and ligature it. This I have had to do twice (both times in the frontal region). One case I was able to watch for four weeks, and he showed no ill effects. The other was operated on in the Somme fighting, and was only watched for a few days before evacuation. He was apparently well then.

I think that all surgeons who did much head work in the war have abandoned plugging for wounds of the superior longitudinal sinus as uncertain and dangerous, owing to the risk of introducing sepsis later and because it entails too much haemorrhage before haemostasis is established. Moreover, bleeding is apt to start again when the gauze is removed. Another point which we learnt was to beware of all depressed fractures near the mid-line of the vertex, and to nibble away sufficient bone around the depression fully to expose the sinus before displacing any fragments likely to have penetrated it. It is no easy matter to stop bleeding from a sinus if the rent is not fully exposed. If bleeding has started before the sinus is fully exposed it is best to place a finger of the left hand on the bleeding point and nibble away bone until the dura is exposed all round that haemostatic finger before attempting to apply a graft.

In order to get at a rough idea of the frequency of this complication I have been through such statistics as I possess. They are the total number of gunshot wounds with fractures of the vault (whether the dura was penetrated or not) operated on in No. 12 Casualty Clearing Station between November, 1916, and November, 1917, and 47 cases operated on by myself in the Somme fighting. There were 614 gunshot wound fractures of the vault, with thirty wounds of the superior longitudinal sinus, or rather less than 5 per cent. superior longitudinal sinus injuries. Of these 30 cases 18 recovered and 12 died. Included in these figures are 11 cases personally operated on (7 recoveries and 4 deaths) out of 215 gunshot wound fractures of vault, or rather over 5 per cent. Probably the incidence of this complication in civil fractures is less than 5 per cent.; 2 per cent. to 3 per cent. would probably be nearer the truth. If this be so, I think that, apart from the opportunities given by the war, few surgeons can have had sufficient experience of wounds of the superior longitudinal sinus to become at home with them. That is why I have ventured to give the results of my experience in this field. I am convinced that any one who is prepared to tackle a depressed fracture should be familiar with the "postage-stamp" method of dealing with this emergency, for it is a complication which may easily cost the patient his life if the surgeon is not prompt and sure in his method of haemostasis. Armed with the knowledge of the "postage-stamp" method, the arrest of haemorrhage from a sinus is hardly ever a matter for anxiety.

Lumbar Puncture.

Lumbar puncture was amongst the procedures which aroused considerable interest during the war. As a means of diagnosis in gunshot wounds it is seldom if ever needed. Post-operative lumbar puncture was very useful for reducing cerebral hernia. It acts slowly, producing its maximum effect in about twenty-four hours. One drachm to three drachms was withdrawn according to the pressure, and the puncture was not done oftener than every forty-eight hours. Occasionally there was a marked recession in place of the hernia after one puncture, and for this reason puncture should not be employed until the hernia is at any rate moderately clean. Our treatment crystallized out to antiseptic lotions (usually Dakin's) till sepsis was well in hand; then lumbar puncture every second or third day till

the hernia was reduced, and then a plastic operation to cover the raw surface. Covering the raw surface with Thiersch grafts is not satisfactory, as it leaves a very poor scar.

Headache with a tense wound is relieved by lumbar puncture. But headache with a lowered pressure is made worse by lumbar puncture. Also if too much fluid is removed headache is caused by lumbar puncture. We had no success in treatment of meningitis by lumbar puncture where streptococci had been demonstrated in cerebro-spinal fluid.

Fits soon after operation occurred in about 5 to 10 per cent. of cases where the dura had been perforated. They were usually associated with high cerebro-spinal pressure and a bulging wound. When this was the case lumbar puncture usually relieved. These fits unless frequently recurring were (contrary to expectation) not of serious prognostic importance.

Anaesthetic.

The war proved without doubt that local anaesthesia can be satisfactorily used in even the most severe cases of fractured vault. It is very satisfactory in patients who are fully conscious. In those quite unconscious no anaesthetic is needed. The cases which show the restlessness of cerebral irritation need a general anaesthetic. Some surgeons used omnipon or morphine for this purpose and still considered that they were operating under local anaesthesia. I preferred to use open ether for such cases. Local anaesthesia (especially novocain and adrenalin) is very satisfactory, and might be used for most of such cases in civil practice. The adrenalin greatly diminishes the bleeding from the scalp flaps, and so saves a good deal of time and irritation.

CONCLUSIONS.

I would suggest that experience during the war has established:

1. The advantages of excision of scalp wounds.
2. The value of metal tubes for draining cerebral abscesses.
3. The ease with which sinus haemorrhage can be stopped by a "postage-stamp" graft.
4. That lumbar puncture is useful in certain complications of fractures of the skull.
5. The value of local anaesthetics in cranial surgery.

THE ETIOLOGY OF DIVERTICULITIS.

BY

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THE very full description of diverticulitis given by Dr. Maxwell Telling in the *British Journal of Surgery* of January, 1917, called my attention at the time to what appeared to be a newly discovered disease, and the interesting discussion on the subject at a meeting of a subsection of the Royal Society of Medicine, and reported in the *BRITISH MEDICAL JOURNAL* of January 17th and 24th of this year, revived speculations as to the causes of this condition. The theories advanced on those occasions were largely based upon appearances found after death. I venture to think, however, that when we are able to collect the previous histories of a sufficient number of cases it will be found that the true causes will be more truly deduced from the living. Although the three cases which I have been able to observe ended in recovery, their clinical history and symptoms nevertheless have suggested some speculations upon the etiology of the disease. I think, in order to realize fully the causes and early stages, we have to consider the whole of the medical history before the appearance of the local lesions encountered at operation or in the *post-mortem* room; and in this history certain types of build and temperament appear to be strong predisposing elements.

In opening the discussion Dr. Telling assumed that the diverticulum is made first, congenitally or otherwise, and that, as is the case of the appendix, all inflammations are brought about by morbid septic activity developing in their

contents, and are secondary. But is it necessary to make this assumption? May there not be a primary infection of mucous follicles such as occurs in the skin in the case of an ordinary boil, or for that matter in an ischio-rectal abscess? In one of my cases ischio-rectal abscess did occur two years before diverticulitis. If such an event had occurred a little higher up the bowel and within the peritoneal cavity, should we not have had diverticulitis? In another of my cases diverticulitis occurred ten years after a severe Whitehead's operation for piles, but whether there was any association between the two I could not say.

The earliest theories regarding the sac formation seem to me to be rather too mechanical. For instance, the belief in gas pressure and constipation was started and is still handed on, although this point is not insisted upon by surgeons in regard to appendicitis; my three cases were associated with looseness of the bowels. The diagnosis in two of them was confirmed by operation by two distinguished surgeons. One of these was found to be suffering from an acute kink resulting from adhesions of the sigmoid to the parietal peritoneum, and the other from a fistulous communication between the sigmoid and bladder.

We are still somewhat uncertain as to the constitutional and local causes at work before the condition declares itself, and I feel sure it would be illuminating to note in all cases the particular type and build and temperament of the patients, as well as any temporary condition of mental worry or powerful emotional disturbance. I have no doubt of the very close connexion between depressing emotion and pathological conditions of the large intestine. We find this to be a constant contributor to the common colitis of this country, and I would suggest that this is the first stage in the creation of diverticulitis; a sensitive and impassioned temperament being the most powerful predisposing factor. In men of this build the effect of acute emotional worry tells at once in some way on the large intestine. The colitis of worry evidently results from diminished trophic innervation and tissue resistance, whilst at the same time the natural digestive ferments are faulty in quantity and quality. Food and the mucous lining become morbidly septic. The *B. coli* becomes more and more virulently active. Probably many follicles are infected, which may account for diverticuli being multiple.

So far, I believe, no one has suggested a comparison with ischio-rectal abscess. May not these abscesses and diverticulitis in their respective origins have much in common? After the fifty-seventh year of life, the sigmoid would appear to be the more vulnerable locality of the two. Possibly many infected follicles of the mucous membrane undergo spontaneous cure by discharge into the bowel, whilst owing to distension and destruction of their lining the sacs thus produced may become what we have hitherto thought to be permanent or congenital diverticuli.

In my cases pain in the left lower quadrant of the abdomen led to some amount of tumour formation (fibrous hyperplasia), very apparent in the case with parietal adhesions and kinking, not so much so in the case in which the sigmoid adhered to the bladder and perforated into it. The latter case exhibited, in addition to the daily passage of flatus by the urethra, all the phenomena of intense *B. coli* toxæmia, showing in succession well marked rigors, fever, violent headaches lasting from two to four days, tinnitus and toxæmic vomiting; evidently the result of leakage of toxins and bacteria into the peritoneum. Two years before these events I saw this man suffering from an acute attack of colitis with diarrhoea, severe colic, and tenesmus.

DURING the year 1918 there were 19,018 cases of diphtheria in Australia, with 607 deaths, out of a population of about five millions.

A CONFERENCE of the "Nordiske Forening mod Tuberkulose" will be held on June 28th, 29th, and 30th, in Stockholm. The subjects to be discussed are (1) tuberculosis legislation in the Scandinavian countries; (2) work therapy in sanatoriums and the organization of colonies and settlements; (3) the special measures required in tuberculosis of the larynx; and (4) the surgical treatment of pulmonary tuberculosis, including treatment by artificial pneumothorax. Representatives from Finland and Iceland, as well as from the three Scandinavian countries, are expected to attend.

ETIOLOGICAL FACTORS IN ABORTION: A STUDY OF 100 CASES.*

BY

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INTRODUCTORY.

THE material on which this paper is based has been obtained from a clinical and pathological examination of a hundred unselected cases of abortion admitted to the maternity department of the St. Mary's Hospitals, Manchester. This is too small a number on which to base authoritative statistics, but the conclusions arrived at indicate the lines along which a more extensive investigation should be carried out.

A majority of the cases belonged to the class of incomplete abortion, and in these the whole ovum was not available for pathological examination.

Our thanks are due to Professor H. R. Dean of the pathological department, University of Manchester, who kindly arranged to carry out the work in connexion with the Wassermann reactions, and to members of the honorary medical staff of the St. Mary's Hospitals, Manchester, for allowing us to examine cases of abortion admitted under their care.

The following table shows the period of gestation at which abortion occurred:

TABLE I.—Period of Gestation at which Abortion Occurred.

	Per Cent.
4 weeks ...	0
6 (inc.) to 8 weeks ...	3
8 (inc.) to 12 " ...	12
12 (inc.) to 16 " ...	40
16 (inc.) to 20 " ...	15
20 (inc.) to 24 " ...	12
Doubtful ...	18

The 18 cases in which the period of gestation was doubtful were all early abortions. The great majority therefore occurred during the first half of pregnancy and 40 per cent. between the third and fourth months.

Table II gives the number of previous full term labours and abortions.

TABLE II.—Previous Full Term Labours and Abortions.

	Full Term.					Premature.							
Pregnancies ...	0	1	2	3	4 and over	0	1	2	3	4	5	9	
No. of cases ...	20	15	17	11	37	60	24	8	1	5	1	1	

In 17 per cent. of the cases there was no previous pregnancy; 80 per cent. had previously had full-term children, 37 per cent. more than three; 40 per cent. gave a history of previous abortions, but in more than half of these abortion had only occurred once.

THE CAUSES OF ABORTION.

(a) Clinical Investigation.

To the question what produced the abortion, the patients replied as follows:

	Cases.
Strain ...	7
Falls ...	6
Kicked abdomen ...	1
Shock ...	2
Injury to foot ...	1
Instruments ...	1
Syringing ...	1
Lead pills ...	8
Sexual excess ...	1
Unknown ...	72

Excluding the above cases, the following abnormal

* From a paper read before the North of England Obstetrical and Gynaecological Society, March 19th, 1920.