(2) Since the stitches do not pass through the skin, and so are not liable to become septic they can be left in permanently and thus serve as a support to the adhesions between stomach and peritoneum.

(3) When the stomach is attached to the whole thickness of the abdominal wall, part of the organ will be much displaced and this will not favour the formation of firm adhesions, when on the other hand the stomach is attached to the peritoneum alone, it returns to its normal position dragging with it a funnel shaped portion of parietal peritoneum.

(4) This retraction of stomach and attached peritoneum leaves a long sinuous tract from the stomach to the skin, which has a great tendency to contract and so prevents any escape of stomach contents.

The employment of a vertical incision, without division of the recti muscles, instead of the old horizontal one, predisposes to contraction of the wound and therefore to the prevention of the escape of stomach contents.

If we can insure the prevention of any escape of stomach contents by any simple method of operating, it is not necessary to resort to more complicated methods such as those of Witzel and Frank, since the opening of the stomach at the time of the first operation introduces more risk.

The operation which I perform is briefly as follows:—

A vertical incision, 3 inches long, is made, commencing just below the tip of the ninth left rib; the fibres of the rectus are separated with the handle of a scalpel, and the peritoneum opened. The stomach is then pulled out and while it is held between the finger and thumb of an assistant, Halsted's sutures are inserted all round the peritoneal opening fixing the stomach to the peritoneum; each suture, which is in the form of a blanket stitch, is passed in a radial direction through the peritoneum then through about $\frac{1}{4}$ inch of stomach wall and then back again through stomach and peritoneum, it is then tied and the ends cut short; each stitch is placed about $\frac{1}{4}$ inch apart, and about 12 to 18 are required. The whole of the fixing of the stomach can be effected in ten minutes. A guiding suture is placed in the middle of the exposed surface of the stomach, and the skin wound is shortened by one or two sutures. The stomach will be found to have retracted considerably dragging with it the peritoneum; the wound is then packed with gauze. On the third or fourth day the packing is removed, and an opening made into the stomach with a small tenotomy knife, into this opening a director is introduced followed by a pair of sinus forceps with which the opening is sufficiently dilated to receive a No. 8 Jacques catheter, which is tied to the guiding stitch in the stomach.

The following brief record of two cases in which I have operated, in this way, will illustrate the method, and shew its efficiency in preventing the escape of gastric contents:

CASE I.—M, aged 65, in the Fulham Union Infirmary, under the care of Dr. Steer, who kindly asked me to operate. The patient had suffered from dysphagia for nearly a year, but had improved at times. He was extremely emaciated, the abdomen being empty and retracted; he could swallow about four mouthfuls of milk, but after the fifth he was always sick, the vomit being unaltered milk and not acid. On passing a bougie, a stricture was found $13\frac{1}{2}$ inches from the teeth, several attempts were made to introduce the smallest size of Symonds's tubes, but nothing could be passed through the stricture; there were no enlarged glands in the neck. Gastrostomy was performed as described above, on June 24th, 1895, and the stomach was opened on June 29th. At first only three ounces of beef tea and peptonised milk were given every three hours, but the quantity was gradually increased to one pint given five times a day. The patient improved in general health for three weeks but then developed diarrhoea which was not controlled by medicines, and he died on July 22nd (four weeks after the operation). There had never been any escape of gastric juice from the wound. At the necropsy the stomach was found to be firmly adherent to the peritoneum, and a long sinuous tract connected the stomach to the external opening; old standing fibroid phthisis was found in the lungs.

CASE II.—M, aged 59, sent to me at the West London Hospital by Dr. F. Alderson. The patient had suffered from difficulty in swallowing for two years and then could only

swallow liquids with difficulty, he also had great trouble in swallowing his saliva and was much emaciated. On passing a bougie, a stricture was found about $12\frac{1}{2}$ inches from the teeth, but as the finest bougie could not be made to penetrate, no Symonds's tube could be introduced.

Gastrostomy was performed on February 5th, 1896, and the stomach was opened on February 9th, and feeding commenced with 3 ounces of strong beef tea, milk and brandy every three hours. The quantity was gradually increased on the succeeding days: thus he was given on the second day $\frac{3}{4}$ v every three hours, on the third day $\frac{3}{4}$ vii every four hours, on the fourth day $\frac{3}{4}$ x, on the fifth day $\frac{3}{4}$ xii, on the sixth day $\frac{3}{4}$ xv, and on the seventh day 1 pint. He left the hospital on March 5th able to feed himself comfortably and suffering from no discomfort from the stomach opening. He attended as an out-patient for three months, and died on May 10th, 1896, from broncho-pneumonia.

At the necropsy a large epithelioma was found surrounding the œsophagus, outside which an abscess had formed and had burst into the pleura. The stomach was firmly adherent to the abdominal wall. At no time did he have any escape of stomach contents from the wound.

REMARKS.—Although there can be no doubt that the sooner gastrostomy is performed for malignant disease of the œsophagus the better it is for the patient, I do not myself resort to it if the stricture is pervious to a bougie, since a trial should then be made with Symonds's tubes. I have treated two cases of carcinoma of the œsophagus, with these tubes with the most satisfactory results; one case, a gentleman, aged 50, regained sufficient strength to go out shooting every day over a rough country, and finally died from a cerebral hæmorrhage which occurred while climbing over a hedge. The other case, a hospital patient, after wearing a tube for some months, during which he gained flesh, bit through and swallowed the silk of the tube, with the result that the tube became blocked, and œsophagotomy had to be performed to remove it; the patient however did not regain his strength and died about a fortnight after the operation.

A CASE OF SUBPHRENIC PNEUMOTHORAX; EXCISION OF RIBS AND DRAINAGE; RECOVERY.¹

BY

F. NICHOLSON, M.D., and D. LOWSON, M.D.,

Physician to the Hull Royal Infirmary. Assistant Surgeon to the Hull Royal Infirmary.

H., AGED 26, single, was admitted into the Hull Royal Infirmary, under Dr. Frank Nicholson, on April 23rd, 1895, and discharged cured on June 14th, 1895. He enlisted in the army in November, 1885, and was for five years in India, returning home in November, 1893, when he left the army, and is now a tram driver.

In 1888 he had gonorrhœa, which lasted off and on for a year, and in 1890 a venereal sore, but this was not followed by sore throat or rash, and the army surgeon only kept him in hospital and on treatment for a week. In 1891 he had dysentery and fever, and was in hospital one month, but since then he has had no looseness or other trouble with the bowels. With these exceptions he had good health till about a year ago.

Both parents are living and healthy, and he has lost no brothers or sisters. One brother, who was in the army, had an abscess in the liver, but is now recovered. He appears to have been temperate, taking one or two pints of beer daily, and rarely anything else.

For about a year before admission he had been complaining of a dull aching pain over the lower part of the right chest, but had kept at work till a few weeks previously, when the pain had become much worse. Beyond the pain he had complained of nothing except occasional nausea and vomiting in the earlier periods.

On admission, the percussion note all over the front of the right chest was high pitched and tympanitic, but good vesic-

¹ Read before the East York and North Lincoln Branch of the British Medical Association.

ular breathing was to be heard everywhere. It was noticed, however, that the hepatic dulness was greatly diminished in its upper part, and did not measure more than 1 inch in the right mammary line; and there was marked tenderness over the region of the gall bladder. In all other respects the examination was negative. There was no jaundice or ascites. The tongue was only slightly coated, the appetite fair, and the bowels acting naturally. The heart's sounds were healthy, and the pulse quiet. The signs over the left lung were natural, and so also were they posteriorly over the right lung; and vocal resonance and vibrations were unaltered over the front of the right lung. The weight was 10 st. 10½ lb. During the next few days the case was repeatedly examined, and on each occasion the physical signs remained much the same. There was hyperresonance over the right lung in front, but with no alteration of the breath sounds or the vocal fremitus or resonance, and the area of liver dulness remained limited to about 1 inch, close to the costal arch. It was, however, noticed further that the bell sound was to be made out in the area of the chest below the nipple line, and on placing the ear posteriorly over the chest Hippocratic succussion was distinct, but a needle inserted posteriorly gave negative results.

The case appeared to Dr. Nicholson at first to be one of hydropneumothorax, and from the raised temperature the probability was in favour of pus, but the existence of good vesicular breathing all over the front and back of the chest, even where it was hyperresonant, did not fit in with this view, and some remarks let fall by Dr. Hainworth, the house-surgeon, led to the case being again carefully examined, when it was noticed that on sitting the patient up the area of hepatic dulness increased to 3 inches, the upper two of which at once disappeared when he lay down again; and it was further noted that though on succussion a splashing sound was heard with the ear on the back of the right chest, it was much more distinct when the ear was placed on the front of the chest below the nipple; and the localisation of the bell sound to an area entirely below the fifth rib led Dr. Nicholson to the opinion that the case was one of a collection of pus and gas below the diaphragm and above the liver. There was nothing, however, to point to the origin of this subdiaphragmatic abscess containing gas. There seemed to be no evidence of ulcer of stomach in the past or of appendix trouble which might have been the starting point, and several years had elapsed since the dysentery without symptoms, so the idea of a perforated dysenteric ulcer with imperfect adhesions

had nothing to support it beyond the fact that the patient had been in India and suffered from dysentery.

Dr. Nicholson then (May 6th) asked his surgical colleague Dr. Lowson to excise some portion of rib and drain the cavity.

REMARKS BY DR. LOWSON.—The first notice I find of an abscess in this situation evacuated through the pleura was in a paper read before the Leeds and West Riding Medico-Chirurgical Society by Mr. Teale on February 6th, 1885. The abscess was said to have originated between the diaphragm and lung, to have discharged through the lung, and to have been cured by drainage through the pleural cavity. There was severe dyspnoea, the other lung being partially solid at the time. This was obviated by covering the opening by absorbent wool, and this by adhesive plaister. Within six months the patient was in vigorous health. Several cases have been recorded of removal of hydatid tumours of the liver through the pleural cavity. In a large proportion of cases subphrenic abscess has arisen from perforating ulcer of the stomach when it presents on the left side. A few are due to a similar ulcer in the duodenum when, as in this case, they cause a right-sided projection. This difference in site is due to the position of the falciform ligament of the liver. Penrose and Lee Dickinson have given an account of 15 cases of completely circumscribed and 10 of partially circumscribed cases.

The operation was performed on May 7th, 1895, in the following manner. A large semicircular flap was reflected backwards from the lateral aspect of the chest wall over the hepatic area. The periosteum was reflected from both surfaces of the 6th and 7th ribs for about 3 or 4 inches, and the ribs removed to a similar extent. The costal layer of pleura was now incised, when the lung slowly fell collapsed, and the pleural cavity could be seen quite dry and healthy. The diaphragm being pushed up by the underlying collection, projected like an immense dome into the chest, so that the diaphragmatic and costal layers of the serous sac were almost in contact, the collapsed lung loose and unattached capping the convexity of the diaphragm. The phrenic layer of pleura was now stitched to the costal membrane, and the flap replaced and stitched in position. The wound was dressed on the 8th and the sutures removed on the 11th.

On May 15th an incision was made in the skin through the middle of the flap, and the scalpel pushed on through pleura and diaphragm (now adherent) into the abscess cavity, and half a pint of very fetid pus evacuated. This was followed

by a thorough washing with weak carbolic lotion and a large double tube was inserted.

May 20th. The cavity has been regularly irrigated, and there is little discharge.

May 29th. Sinus still open.

June 8th. One and a-half inch single tube still in. Very little discharge.

August 20th. The patient is now quite well.

Surgeons vary in their mode of procedure. Godlee prefers an incision along the costal margin.

A CASE OF THROMBOSIS OF THE ABDOMINAL AORTA.

By WALTER BELL, M.D. EDIN.,
Surgeon to the Lowestoft Hospital.

ALTHOUGH this case is unfortunately incomplete in some respects, it presents several features of interest, and appears to be worth recording.

R. S., aged 30, a smacksman, was admitted to the Lowestoft Hospital on the afternoon of August 7th, 1895, suffering from total paraplegia and intense pain in the legs and lower part of the back. His previous health was stated to have been uniformly good. About two years previously, however, his wife was an out-patient of the hospital, under Mr. H. B. Walker, for secondary syphilis.

On the afternoon of the day of admission, while walking in the street, the patient was suddenly seized with intense pain in the back and abdomen, and at the same time he felt his legs become powerless. He fell to the ground, but did not lose consciousness.

Aorta laid open from the front showing coagulum.

The following are condensed notes of his condition:

On admission, severe shock, skin cold and clammy, pulse feeble, temperature 97°. Absolute paralysis of motion in lower extremities. Anæsthesia and analgesia of legs, extending upwards as far as the lower third of the thigh on both sides. Above the anæsthetic area there was a zone of hyperæsthesia about 2 inches in width; above this zone the cutaneous sensibility appeared normal. No knee-jerks or plantar or cremasteric reflexes. Patient complained of severe pain in the lumbar spine and in the legs and thighs.

August 8th. During the night he was very restless, complained much of thirst, and vomited once. He had several loose stools, and after 2 A.M. these were passed involuntarily in the bed; the urine, too, dribbled away. Paraplegia was complete, the lower limbs were deadly cold and quite pulseless. There was absolute loss of control over the sphincters

of the bladder and bowel. The anæsthesia seemed to have extended upwards as far as the trunk, but this could not be definitely ascertained, as there was considerable mental confusion. No urine had been passed, but in the evening 1 ounce of turbid, foul-smelling urine was drawn off by a catheter; it contained no albumen.

August 9th. The patient was delirious and very restless all night, but took fluid nourishment freely; diarrhoea was less; no urine was passed. By morning he was semi-conscious, much weaker, and evidently dying, the temperature 97.2°, the respirations hurried and shallow. There was commencing gangrene of the skin of the right calf and of part of the scrotum, and the patient exhaled a strong gangrenous odour. A thin watery fluid was almost constantly discharged from the bowel. The bladder was found to contain only about 1 drachm of foetid urine. He gradually sank, and died just after midnight, fifty-six hours after the onset of his illness. Most unfortunately the relatives refused to allow a *post-mortem* examination, but with great difficulty I obtained permission for a partial examination.

On August 10th, with the assistance of my colleague, Mr. H. B. Walker, I removed the lumbar enlargement of the cord together with the cauda equina. There was no sign of disease of either cord or membranes, and the Clinical Research Association reported that the portion of cord sent them showed no pathological lesions. Then, opening the abdomen, we examined the abdominal aorta. This we found to be occluded by a firm white coagulum for 1½ in. above its bifurcation, extending from a little below the origin of the inferior mesenteric artery downwards into the common iliac artery on either side, 1 in. into the left, and ¾ in. into the right trunk. No pathological change was observed in the coats of the vessel itself.

I need not say that I very greatly regret that we were prohibited from making a complete *post-mortem* examination. One would have wished especially to examine the heart and the rest of the aorta and its branches, the remainder of the cord and the brain, and to search for visceral syphilitic lesions. But, as I have said, it was only after a great deal of trouble that we obtained permission for even a limited examination.

REMARKS.—Perhaps the most interesting point in connection with the case is the question of the causation of the paraplegia. It appears probable that the motor and sensory paralysis which occurred was due to arrest of the blood supply to the lumbar region of the cord. A similar condition has been produced experimentally in rabbits (Stenson) and dogs (Astley Cooper and others). It was found that compression of the abdominal aorta for two or three minutes caused complete paralysis of the hind limbs as regards sensation, voluntary motion, and reflex action. In this case it seems probable that, owing to the occlusion of the aorta for nearly 2 ins. above the bifurcation, the direct blood supply of the cord through the lowest three lumbar arteries was arrested. These arteries go to supply the region of the lumbar enlargement, giving rise to the first, second, third, and fourth sacral nerves, and the sacral plexus (formed by the anterior divisions of the three upper sacral nerves, part of the fourth, and the lumbosacral cord) which furnishes the great and small sciatic and the pudic nerves, as well as muscular branches. If, therefore, this part of the cord was suddenly deprived of blood and thereby rendered functionless, it is not difficult to understand the extensive paralysis which ensued.¹

¹ An account of this affection is given by Garland in Pepper's *System of Medicine*, vol. iii.

CANADIAN SANATORIUM FOR CONSUMPTION.—Dr. Edward Playter, of Ottawa, Canada, has established a sanatorium for consumptives at Gatineau Mountains near Ottawa. It lies midway between the Atlantic Ocean and the Great Lakes. Its atmosphere, it is stated, is dry, and remarkably free from germs, owing in summer to the rapid vegetation, and in winter to its sheet of snow. No specific line of treatment is followed, though antiseptic remedies are used in cases in which they appear to be indicated. The locality has been selected on meteorological data as specially adapted for the treatment of phthisis, and will doubtless be of great use to patients in Canada as well as, possibly, to travellers from Great Britain.