I do not think I am far wrong in saying that if people took regular exercise and kept their abdominal muscles in good trim, if people in sedentary occupations would resort to physical exercises designed to keep up the tone of their abdominal muscles, and if there were less conveniences for those who can walk, there would be less appendicitis.

The interesting question arises as to whether a "strain" can cause an attack of appendicitis. I think it can. I have had a few cases where the condition has followed a sudden strain. If suddenly the abdominal muscles contract, especially on a loaded caecum, it is quite easy to see how this could bring about a sudden rotation of the appendix on its meso-appendix.

What I have said in this paper has struck me before the beginning of the present war, but from statistics I have observed since mobilization in August I am still further convinced.

I had a number of cases of acute appendicitis I operated upon early after mobilization, but out of two brigades there has not been an acute case for nearly three months. I think this speaks for itself.

TWO CASES OF DIAPHRAGMATIC STAB WOUND.

WITH OBSERVATIONS ON THE PRODUCTION OF DIAPHRAGMATIC HERNIA AND OPERATIVE TECHNIQUE.

By CHAS. JOHNSTON SMITH, M.B., F.R.C.S.E.,

LECTURER ON SURGERY TO THE SINGAPORE MEDICAL SCHOOL AND SURGEON TO THE SINGAPORE HOSPITALS.

CASE I.

A CHINESE rickshaw puller, aged 30, was brought to the General Hospital, Seremban, by the police on April 7th 1912, with a stab wound of the right chest.

History obtained from the Police.—At 6.30 a.m., while purchasing a ticket at the railway station, his companion when standing behind him thrust a small hunting-knife with a 4-in. blade into the right side of his chest.

State on Admission.—He was admitted at 9.30 a.m., three hours after receiving the wound. His clothes, consisting of a cotton jacket and pants, were saturated with blood. He was exsanguine, very restless, and unable to answer any questions owing to his fainting and collapsed condition. Respiration was shallow and frequent (54 per minute), with grunting expiration. The pulse could not be counted at the wrist. There was a stab wound in the fourth intercostal space in the anterior axillary line, from which blood trickled in a constant stream and was being churned into a bloody froth by the air exchange through a patent thoracic fistula. The abdomen was tender over the right side, most definitely in the iliac region and loin.

Operation.

A vertical elliptical incision round the stab wound was made from the third to the seventh rib and the outlined ellipse of skin excised. The fifth and sixth ribs were resected for $4\frac{1}{2}$ in. The periosteal beds were each incised in the whole length thus exposed. Two Kocher clips were passed from these wounds to include the tissues of the fifth space. The structures were divided between the clips, and the flaps thus produced were folded outwards. When the blood and clot filling the chest were turned out, blood was seen to be entering the pleural cavity through a wound in the muscular portion of the diaphragm about 3 in. long, with a direction, from within, outwards and forwards. Respiration was very embarrassed, but at once improved when the lung was gripped in a clamp and part of the lower lobe held outside of the wound, thus fixing the mediastinal structures, as pointed out by Kelly. A finger, in the diaphragmatic incision, discovered a wound of the subjacent upper surface of the liver, just in front of the coronary ligament. A gauze plug, introduced through the diaphragmatic rent, failed to control the haemorrhage. The diaphragmatic wound was extended a little in both directions, and pressure by an assistant on the abdomen helped to fix the liver. A wound, about $1\frac{1}{2}$ in. deep and some $2\frac{1}{2}$ in. in length, bleeding freely, was well exposed. This was closed by one long mattress suture of catgut passed deep to the wound from right to left and back from left to right, tied parallel to the wound. A sharp-pointed, fully-curved needle, being all that was to hand, was used, and

this produced no fresh bleeding from its tracks when the stitch was tied. Four interrupted sutures through the capsule with fine catgut got tidy approximation of the previously everted lips. The incision in the diaphragm, now some $4\frac{1}{2}$ in. in length, was closed by a continuous blanket stitch of catgut extending a little beyond each end of the incision. A small incision of the margin of the lower lobe of the lung was sequestered by a catgut ligature. The chest flaps were united, and the skin closed without drainage. He had received saline (normal), 2 pints, into a vein of the left arm during the above manipulations, and the anaesthetic used was ether two parts, chloroform one part, on a mask.

The pulse when he left the table was 144, soft, and with a collapsing vessel. Six hours later the pulse was 128. He then had a deposition taken by a magistrate, involving half an hour's oral examination and the identification of his assailant. Continuous proctoclysis during the next twelve hours sustained an almost constant pulse-rate. He rapidly developed bronchitic sounds over the left lung, and breath sounds were never present on the right side. He died in respiratory distress thirty-two hours after the accident.

Necropsy.—Right lung collapsed; no haemorrhage in chest. Liver wound dry; some soiling of the right abdomen with tarry blood; about 2 oz. of blood in pelvis. Left lung, marked capillary bronchitis.

CASE II.

A Chinese coolie, aged 31, working on the Labu F.M.S. Rubber Estate, was sent to the Seremban General Hospital by the manager of the estate at 2 p.m. on October 23rd, 1912.

History obtained on Admission.—During a quarrel on the previous evening he was struck over the left chest with a sharp-pointed, triangular file. He had suffered considerable pain in the chest and abdomen during the night. This had been relieved by opium, administered to him by his friends. As he was worse in the morning, and had vomited several times, the manager was informed. With the case he sent a note informing me that "the man was vomiting, and wanted to pass water constantly."

State on Admission.—Eighteen hours after the injury he was drowsy from opium, with contracted pupils, but still complained of some general abdominal pain. He was a little cyanosed, and had frequent shallow respirations of 30, and a full, strong pulse of 60 per minute. There was a triangular-shaped wound on the left chest over the eighth interspace in the mid-axillary line. This small wound had been plugged with gauze, and the surrounding skin was blistered by some strong antiseptic dressing. The left chest was hyper-resonant, and breath sounds were absent. The abdomen was full, with all the muscles rigidly on guard, in spite of the liberal opiate. Tenderness was general, and was best demonstrated when steady pressure was suddenly relaxed. There was some bulging and tenderness of the pelvic pouch on rectal examination, and the pelvic peritoneum was tender. When the small gauze plug was removed from the wound there was no bleeding, and air could not be detected as entering the chest cavity. A director was passed into the wound in a forward and inward direction, with a downward inclination. This oblique penetration of the chest wall produced in the dorsal position complete closure of the thoracic fistula. When the valve was momentarily obliterated by the director, air was aspirated through the wound, and blood trickled out.

Operation.

As everything was ready in the theatre for another laparotomy, the operation was started within half an hour of his admission. Under chloroform, a 3 in. median sub-umbilical incision was made, and about half a pint of blood was evacuated. Distended small intestine crowded into the incision, but was not allowed to herniate. A tube was passed into the pelvic pouch, and the lips of the peritoneum temporarily closed by "Kocher" forceps applied above and below it. A penetrating wound of the diaphragm was diagnosed, and a wound of the liver or spleen suspected. An oblique subcostal incision, falling 2 in. below the left costal edge, extending from within an inch of the mid line to below the tip of the eleventh rib, was made. The anterior sheath of rectus was dissected up and down from the muscle, and, at its outer edge, the anterior portion of the internal oblique aponeurosis was divided at its line of fusion with the external oblique aponeurosis. The rectus was raised from the posterior sheath and retracted inwards. The internal oblique was split, and the abdomen opened through the transversalis and peritoneum for the whole length of the wound. Pads, below and to the right, controlled the distended gut. The spleen was delivered, but was found unwounded; it was remarkably "unpathological" for a resident in this country. The diaphragm could be well inspected through this

incision, and some blood was observed to be coming from above the left edge of the liver. The liver was folded on its under surface at one part of its left margin, involving the liver for about $1\frac{1}{2}$ in. from the thin, tongue-like left edge. The liver was next displaced from the diaphragm, when a wedge of liver was observed to escape from the lips of a wound in the diaphragm, and a small wound of the liver was seen on the surface at the apex of this wedge. A finger passed into the diaphragmatic wound allowed air to enter the chest, and a few ounces of blood escaped into the abdomen. The diaphragmatic wound had fallen on the region where the muscle fibres blend with the central tendon just outside the cardiac area. The wound was about 2 in. long and extended, from within, in an outward and forward direction, into the muscle fibres. The pulse at this stage was causing the anaesthetist considerable anxiety owing to the constantly increasing pneumothorax from air being aspirated through the now unguarded diaphragmatic wound. With a hand below the diaphragm, the heart could be detected to contract feebly and irregularly. With a few manipulations of stroking compression good regular contraction was rapidly re-established. During these manipulations and the subsequent readjustment of the pads, a button of anterior wall of stomach had passed into the wound in the diaphragm and required some little traction to disengage it, as the herniated button was distended with gas. The diaphragmatic splitting had increased for about 1 in., so that the wound was now some 3 in. in length. A continuous buttonhole suture of catgut was introduced extending beyond either end of the diaphragmatic wound, passed through the whole thickness of the diaphragm and including half an inch of tissue on each side of the wound. This controlled some haemorrhage which had been going on from vessels in the edge of the diaphragmatic wound, very satisfactorily. The small wound of the liver was not bleeding and required no treatment. The abdominal incisions were then closed without drainage. The small stab wound in the thorax was excised by an elliptical incision and the thoracic fistula closed. The chest was then aspirated while pressure was applied to the chest wall to re-constitute the negative pressure in the pleural cavity and to balloon the lung.

Convalescence was uninterrupted and complete. Respiration was never more than 30 per minute after the first twelve hours following the operation. The wounds were dressed upon the tenth day and the stitches were removed, no subsequent dressing being necessary. The patient was discharged to resume his work, as a "tapping" coolie on a rubber estate, on the nineteenth day after the operation.

Eighteen months after the operation the manager informed me that the coolie had been in full work ever since he returned to the estate.

Conclusions.

The practical points of interest in these cases are:

CASE I.—The immediate improvement in the then alarming condition of the respiration and pulse by fixing the mediastinum with traction upon the lung. The splendid exposure, and comparatively easy suturing of the diaphragm and liver, got by the π -shaped flaps in the chest wall. The loss of the patient through deficient functioning lung tissue.

CASE II.—1. The splendid exposure of the diaphragm, with efficient room for suture manipulations, through the oblique subcostal incision.

2. The mechanism observed in the production of diaphragmatic hernia.

3. The powerful stimulating effect of heart massage observed and the lasting benefit thereof.

4. The great benefit to respiration by reconstituting the negative pressure in the chest, and the marked contrast in the respiratory comfort throughout convalescence contrasted with that of the patient in Case I, where a pneumothorax was left to be absorbed.

SENATOR J. W. DANIEL, of St. John, New Brunswick, has been elected President of the Canadian Association for the Prevention of Tuberculosis, in succession to the late Colonel J. H. Burland, who died recently in London. This year the annual meeting will take place in Vancouver on July 5th next.

A METHOD FOR THE BACTERIOLOGICAL EXAMINATION OF THE NASO-PHARYNX IN EPIDEMIC CEREBRO- SPINAL MENINGITIS CONTACTS.

BY

WALTER H. FEARIS,

BACTERIOLOGIST TO THE CARDIFF AND COUNTY OF GLAMORGAN PUBLIC HEALTH LABORATORY; FORMERLY SPECIAL LECTURER ON BACTERIOLOGY, KING'S COLLEGE, UNIVERSITY OF LONDON.

It is well known that the upper part of the naso-pharynx offers conditions favourable for the growth of the meningococcus of Weichselbaum. In the control of epidemic cerebro-spinal meningitis the value of the bacteriological examination of the naso-pharynx of "contacts" depends largely on the efficiency of the apparatus used for obtaining a "swab" from the region referred to. The apparatus should fulfil the following conditions: (1) it should enable the swab to be taken free from contamination by the bacteria of the mouth and the fauces; (2) it should avoid all risk of injury to the naso-pharynx; (3) the effective area of the surface of the swab which actually comes into contact with the naso-pharynx should readily permit itself to be smeared over the surface of the culture medium, such as nasgar, in a Petri dish. The instrument here described fulfils these conditions.

The essential part of this instrument is a flexible spiral spring, *w*, to which the swab, *s*, is attached. By this arrangement the effective area of the swab can be readily brought into close but *gentle* contact with the surface of the culture medium. The spring is fitted on to a rigid wire, *h*, along which runs an adjustable safety stop, *p*. This stop is fixed before use so that the swab, *s*, can be protruded a short

distance beyond the opening, *l*, in the metal cannula, *m*. The swab, *s*, is then drawn up into the cannula, *m*, and the whole is sterilized in a metal case. The action of this safety stop in preventing injury to the naso-pharynx is obvious. In the examination of a patient the end, *l*, of the cannula is passed behind the uvula. The swab is then pushed out as far as the safety stop permits. The thumb of the right hand is placed in the ring, *r*, when the swab is being pushed forward. After the swab has been brought into close contact with the naso-pharynx, it is drawn back into the cannula, and the instrument is removed from the patient's mouth. As soon as possible, the safety stop, *p*, should be unscrewed; then the swab is pushed out well beyond *l* and is smeared over the surface of a Petri dish of nasgar, the curved part of the cannula, *m*, being turned downwards. A second Petri dish of nasgar is inoculated by means of a sterile, *L*-shaped, glass rod, the shorter arm of which has been smeared over the first dish. The two Petri dishes are placed in the warm incubator (37° C.) and examined in due course.

The instrument has been constructed for the writer by Mr. A. W. Staniforth, surgical instrument maker, 6, Church Street, Cardiff.

On April 29th and 30th the new buildings of the Washington University Medical School in St. Louis were formally opened. Addresses were delivered by the Dean, Dr. Opie, Dr. William H. Welch, President Lowell of Harvard, President Vincent of the University of Minnesota, and Dr. Simon Flexner. The cost of the new buildings, including the hospitals, is given as £600,000. One of the most interesting features of the ceremony was the presentation to the Washington University Medical School of a number of manuscripts and papers of William Beaumont, among them being the original notes of his experiments on Alexis St. Martin. A room has been set aside for the housing of these manuscripts in the library of the medical school.