frequency of respiration which persisted for days, and had not entirely subsided upon their discharge to convalescent camp.

GROUP II.—THE MODERATELY SEVERE CASES.

These patients were actually ill. They were cyanotic, with frequent panting and painful respiration, which caused them the greatest discomfort. Headache was very marked, and pyrexia up to about 100° F. was common for three or four days. The physical signs varied in different parts of the chest. In the upper part the sounds were loud, with sibilant rhonchi. Lower down, especially at the back, there were submucous râles, indicating a "bronchiolitis." Such patients were usually drowsy, and tended to get much worse at night.

GROUP III.—THE VERY SEVERE CASES.

The only case of this group which came under our care, and of which we propose to give some detailed notes together with the *post-mortem* findings, exhibited signs of extreme poisoning which led to a fatal result. The man was admitted in a semi-comatose condition twenty-four hours after being exposed to the fumes. He was intensely cyanotic, respiration-rate 30 to the minute, pulse 88, throat dry and red, tongue cracked and furred.

When roused—which could only be done with great difficulty—the patient indicated by signs that he had severe pain in the chest. He was unable to cough, and there was much rattling with the breathing. Physical signs showed râles all over the chest, front and back. The fremitus of these râles was easily palpated by the hand. The condition was diagnosed from these signs as acute pulmonary oedema following exposure to irritant fumes. The blood pressure appeared to be raised, though apparatus for verifying this was not at our disposal. Bleeding was resorted to, and 12 oz. of blood were withdrawn from the median basilic vein at the elbow. The intensely dark colour of the blood and its remarkable rapidity of clotting were the special features noted, and the latter condition made the operation very tedious and difficult. The patient seemed to be relieved for a time but never regained consciousness, and died in twenty-four hours from the time of his admission, and forty-eight hours in all from the time of being exposed to the fumes. Oxygen was administered throughout without any benefit. Postural treatment resulted in large quantities of frothy secretion pouring out of the nose and mouth, but at no time was the patient able to expectorate this for himself.

Post-mortem Examination.—The body was that of a moderately developed adult man. There were no external signs of interest. Rigor mortis was complete two hours after death. Examination of the chest showed very firm old pleuritic adhesions between the left lung and the chest wall. The lungs were fully expanded, crepitant throughout, and floated in water. On section they emitted a very tenacious frothy and slightly blood-stained exudation from all parts of both lungs. The same was also found filling the trachea, bronchi, and bronchioles, indicating a condition of general acute pulmonary oedema. Subpleural haemorrhages were also found in various places. The heart showed some hypertrophy of the left ventricle, but was otherwise normal. The liver was congested. The left kidney was enlarged, and showed two infarcts, one pale, the other red, but the capsule of the kidney stripped easily, and there were no signs of nephritis. The right kidney was normal. The spleen was not enlarged nor congested. The other abdominal organs were normal, likewise the brain, which was carefully examined. The urine was normal in colour, acid, specific gravity 1020, and contained no pathological products. Smears taken from the blood, and stained by Leishman's stain, showed a remarkable number of cells indistinguishable from myelocytes, and also an increase in the lymphocytic elements of the blood. The polymorphonuclear leucocytes were diminished to about 30 per cent. The red cells were unaltered. We would wish to call attention to this condition of the blood, and should be glad to hear if such changes have been observed in other cases of a similar kind that have been investigated.

Treatment varied according to the group under which the patient was diagnosed. Those of Group I, Class A—that is, those with dry physical signs—received a purge and a bronchial sedative. Those of Group I, Class B and

Group II—that is, those with moist physical signs—received a hypodermic injection of atropine sulphate $\frac{1}{10}$ gr., and for a few days were put on a mixture containing belladonna. In two cases emesis was produced with good results. In our one case of Group III we found no treatment of any value. Transfusion with normal saline after bleeding might have been done, but, in our opinion, it was contraindicated on account of the possibility of increasing the pulmonary oedema. The administration of atropine to this case also occurred to us, but, owing to the lungs being already so full and the paralysing effect of the drug on the coughing reflex, we considered its use inadvisable.

We shall be interested to hear of other investigations carried out on similar cases, and especially shall we be interested to note if such findings agree with ours also; we shall be glad for some suggestions for the treatment of the severe cases.

ANEURYSMAL VARIX OF POPLITEAL VESSELS FROM GUNSHOT WOUND.

By ROBERT BALL WRIGHT, F.R.C.S.I.,

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WOUNDS of blood vessels are always interesting surgically, and are particularly so at the present moment; and this fact, and my sympathy with Sir William Osler's desire that all such cases should be put on record, is my excuse for the following note.

Private O. M., 2nd Northants Regiment, aged 22, was at Neuve Chapelle, and on January 29th was shot in the left leg while on the way to bring up the company's rations. He was carried to a dressing station, and subsequently sent to England, arriving at St. John V.A.D. Hospital, Chester, on February 8th. He complained of pain in the neighbourhood of the left knee, and inability to use the limb. On examination it was found that a bullet had entered the outside of the leg immediately behind the fibula, and about an inch below the level of the head. It passed horizontally through the limb, and made its exit behind the tibia on the inner side, the track being on a level with the lower part of the tibial tuberosity. The wound was clean and healing well.

The lower part of the left popliteal space was rather full, but there was no definite tumour. On palpation what Sir William Osler, who saw the case, described as a "remarkable pistol shot shock" could be very distinctly felt in the lower part of the popliteal space, and could be traced in diminished force some way down the leg. There was a marked impulse, and a very distinct thrill was discernible. On auscultation the typical bruit was heard, loud, harsh, and roaring. The limb did not appear to differ in temperature from the sound leg, but no pulse could be felt in the posterior tibial or dorsalis pedis arteries, and the skin presented a slightly dusky hue, which may have been caused to some extent by a moderate degree of "frost-bite" from which the patient suffered. When he had recovered from this complication an operation for the cure of the varix was performed on March 26th.

On exposing the vessels it was found that the bullet had passed between them exactly where the popliteal vein crosses behind the artery, wounding their coats, and they were closely adherent, without any intervening sac. The artery was neither generally nor locally dilated. The vein seemed unusually large. The internal popliteal nerve was uninjured. I divided the artery between two ligatures above and below the anastomosis, and then applied Crile's clamps to the vein with the intention of separating it from the artery and stitching it. It struck me, however, that I might find it possible to put a ligature round the venous side of the anastomosis without occluding the lumen of the vessel, and the attempt proved successful. The gastrocnemii, which had been somewhat freely split, were brought together with a few interrupted catgut sutures, and the deep fascia sutured continuously. The patient made an uneventful recovery, with the exception of suffering great pain in his toes for the first two or three days. This I have found in other patients who have undergone operations on apparent recovery from "frost-bite." The present condition of the leg is normal, except for a little

stiffness. The shock, thrill, and bruit have all disappeared, and the pulse can be felt in the posterior tibial and dorsalis pedis vessels. It will be seen that the popliteal vessels must have been wounded just above the division of the artery.

I am much indebted to Sir William Osler for his interest and loan of recent literature; to my colleagues, Dr. Jephcott (anaesthetist), and Mr. Blagden who assisted me, and to the nursing staff for their excellent arrangements.

ANGLO-FRENCH HOSPITAL, NO. 2, CHATEAU TOURLAVILLE, CHERBOURG.

BY

MABEL L. RAMSAY, M.D., CH.B. EDIN., D.P.H. CANTAB.,

AND

FLORENCE A. STONEY, M.D., B.S. LOND.

This hospital was organized by the Women's Imperial Service League (Mrs. St. Clair Stobart administrator). It arrived at the Chateau Tourlaville, Cherbourg, on November 6th, 1914, and patients were received two days later, on November 8th. It closed March 24th, 1915.

As a hospital, a sixteenth century chateau is not ideal, but with proper organization it became adapted for its purpose of a temporary military hospital. The sanitation was primitive, a pail system being necessary. The extent of the grounds surrounding the chateau enabled the trenches to be placed at a sufficient distance, so that contamination of the water supply was not possible. The greatest hardship has been the lack of water taps, except on the ground floor, and the lack of gas for heating. Water had to be brought up two flights of stairs, and all boiled for surgical use over oil stoves.

The medical staff consisted of Miss Florence Stoney, M.D., Médecin-en-Chef and Radiographer; Miss Kathleen Gibson, M.B., Miss Helen Hanson, M.D., Miss Mabel L. Ramsay, M.D., Miss Mildred Staley, M.B., Miss Joan Watts, M.B., and, later, Miss Ina Clarke, F.R.C.S.I., and twelve nurses, with Sister Bailey in charge.

The hospital was well equipped with four motor ambulances and two touring cars. Also there were some twenty orderlies to help in multifarious ways. It was due to their untiring exertions that the many wheels have run so smoothly. Patients were fetched from the arsenal in the ambulances, having been brought by steamer from Dunkirk or Calais to Cherbourg. Only the gravest cases remain in the local hospitals, the greater proportion being entrained for other districts in France. In November last some 5,000 to 7,000 wounded were being landed.

From November 6th to January 5th there have been admitted to this hospital 106 patients. During the first six weeks it was one constant struggle to overcome sepsis; in fact, pus was chased up and down the limbs.

Notes of some of the cases are appended. The majority have been compound fractures, and almost all horribly septic.

Fractures of the Cranium.

CASE I.—A gutter fracture of the vertex of the skull from a sabre or bayonet cleaving the skull in an antero-posterior direction and exposing the grey matter of the brain. He was quite unconscious when admitted, and also completely paralysed. When not sleeping he moaned, "Oh! mon majeur." There was a constant outpouring of pus, and brain substance came away freely in the dressings. He died four days after admission of septic meningitis, no operative procedure being possible in this case.

CASE II.—A marine with a compound fracture in the neighbourhood of the external angle of the frontal bone, caused by an exploding shell, and exposing the left frontal lobe for about two square inches. The dura mater was not torn, only pierced by some sharp spicules of bone. The flesh wound also tore the outer part of the eyebrow. The patient when admitted was in a state of great cerebral irritation. The next day he was chloroformed, and several pieces of the depressed fracture were removed.

The after-treatment consisted of boric douching and use of weak hydrogen peroxide, with four-hourly fomentations. He made a rapid recovery, and fifty-five days after admission he was discharged completely healed. The mental condition showed signs of some instability.

CASE III.—This was a fracture of the right external angular process of the frontal bone, and also involved the orbital

plate. The right eye was ruptured by an exploding shell. The clinical picture was one of panophthalmitis. The day following admission the eye was removed and orbit freely drained. At the time of operation no foreign body was felt in the orbit. By an x-ray photograph a piece of shell about $\frac{3}{4}$ in. long and $\frac{1}{4}$ in. thick was shown to be lying far back in the orbit. This was subsequently localized and removed.

For a time after the removal of this foreign body he had severe headaches, and one feared the complication of cerebral abscess. He, however, considerably improved under potassium iodide grains x t.i.d. The orbit drained freely, several pieces of necrosed bone (orbital plate) gradually detached. Repeated exploration with a probe failed to reveal any fissure in the roof of the orbit. The general condition was improving.

After being in hospital 101 days there was a recurrence of headaches, but they were of an intermittent character. Pulse 70; temperature normal, with an occasional rise to 99° F. in the evening. He never had any cerebral vomiting. Once or twice he had complained of nausea. At this date the left eye was examined by an oculist; vision $\frac{3}{4}$; there was no evidence of papillitis, only some floaters in the vitreous.

Three days after this examination, that is, on the 104th day, he had an attack of severe bilious vomiting, which lasted two days. On the 106th day the hitherto free purulent discharge lessened and the headache increased. He became queer and was disinclined to get up. The temperature rose to 99° and the pulse fell from 70 to 65, then to 58 in the next three days. A diagnosis of cerebral abscess was made, and on the 109th day he was brought to the theatre with a view to exploring the frontal lobe through the fractured orbital plate.

Half an hour before the anaesthetic (CHCl_3) he was given a hypodermic of morphine gr. $\frac{1}{4}$. He had just had 5iv CHCl_3 when respiration suddenly failed. Artificial respiration was at once begun and kept up for one and a half hours; stimulants of ether, atropine, and intravenous saline were given, but all of no avail. The heart continued to beat for one and a quarter hours and then failed.

Post-mortem Examination.—The orbit was explored, and a large fissure on the outer side of the orbit was found. It admitted the finger, and dura was felt. A trephine opening through the temporal bone revealed a bulging dura, through which, on incision, pus welled up. A large abscess cavity was found occupying at least one-third of the frontal lobe.

Apparently this was a case in which some portion of the septic bone had been carried into the brain substance, and whilst the orbit drained freely the symptoms were quiescent. The closure of the fissure with granulations rapidly produced symptoms of cerebral compression. Also, one fears that the administration of morphine given before the operation was a contributing factor for the onset of respiratory failure.

Throughout the period of observation—that is, 109 days—there were few symptoms to assist a diagnosis of cerebral abscess, the temperature and pulse being no guide; the headache was intermittent, and did not seem of sufficient intensity to warrant a diagnosis of cerebral abscess.

CASE IV.—In this case the bullet entered the left cheek and came out behind the right ear. In its passage it had fractured the left superior maxilla, crossed the spheno-maxillary fossa, and out through the right temporal bone on a level with and behind the external auditory meatus, the passage of the bullet being well shown by the x-ray photograph. His chief symptom was headache, and tenderness of the temporal bone when touched. He was discharged quite healed twenty-seven days after admission.

Fractures of the Jaws.

CASE I.—A compound fracture of the lower jaw, the whole of the chin being blown away. He was in a state of suffocation when he came in, and required immediate tracheotomy. The history given was that he had been unable to swallow liquids or solids since being wounded, eight days previously. The whole neck was in a state of cellulitis, the tongue was swollen, and the wounds involving upper and lower lips were foul and stinking. Tracheotomy was done with some difficulty owing to the enormous swelling of the neck. The trachea was opened and a tube inserted, but he died a few minutes after, artificial respiration being of no avail.

CASE II.—A fracture of upper and lower maxilla on the right side due to an expanding bullet fired by a German up a tree. The bullet passed through the mouth, shattering the alveolus posteriorly of the superior maxilla, and the entire vertical ramus of the inferior maxilla, producing a large stellate wound of the face. The bullet then dented a metal button and passed down below the right coracoid process, splintering the coracoid, and finally ending in the axilla, breaking up into numerous pieces. For a time the external carotid artery was exposed, and with so much sepsis there were fears of a secondary haemorrhage from this artery. Portions of the jaw have been removed, but now the face wound has completely healed up. Most of the pieces, carefully localized by Dr. Stoney, have been removed, and the long track from below the coracoid process into the axilla after three months' suppuration has now completely healed. A few pieces remain, but as they are not giving trouble they will be left *in situ*. He is able to eat well, and there is good movement in the shoulder.

CASE III.—A very bad case, with the whole of the bony portion of the chin and lower lip blown away, the upper lip being split. His condition was one of foul sepsis. He can only take food when lying down. He awaits a plastic operation to re-form the lower chin and lips.