able to apply their knowledge not merely to the improving of old methods of treatment, but also to the devising of new methods to meet the new conditions they had to deal with and the new environment in which they found themselves.

It is largely due to team work by the younger men that great advances have been made, not only in wound treatment, but in the early and late treatment of fractures, especially fractures of the femur, in wounds involving the joints, in injuries to the nerves, and in military orthopaedics generally; also in wounds of the lungs and pleura and their complications, as well as in injuries of the skull and brain. Special mention must also be made of the wonderful work which has been accomplished in connexion with the repair and reconstruction of the parts after severe facial injuries. In this work the dental surgeon has taken a prominent part; indeed, he has been indispensable. Lastly, much valuable information has been obtained also with regard to the nature of shock and to the methods of combating it.

PROFESSOR CAIRD.

I feel I cannot conclude my address without taking this opportunity of saying what I owe to my distinguished predecessor, Professor Caird. Lister's love of surgery was well known. Caird's is certainly no less profound. His enthusiasm for surgery and his love of teaching have been unbounded.

Fortunately, although Professor Caird has reached the age at which he must retire from the chair, he is as vigorous as ever, both in body and mind. It is to be hoped now that, freed from arduous hospital work and clinical teaching, he will find time to give to the surgical world some of the fruits of his ripe experience.

I have already referred to the splendid system of clinical teaching adopted by the late Professor Kocher. I feel sure I am correct in stating that a similar system has been followed—and with the same thoroughness and success—by my distinguished predecessor in this chair, and it will be my endeavour, as far as in me lies, to follow in his footsteps.

TWO CASES OF TRAUMATIC ANEURYSM OF THE COMMON CAROTID.

BY

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I VENTURE to publish an account of these two cases because I think them to be of interest from a surgical point of view, and also because the patients not only survived their original wounds but also operative interference.

CASE I.—*Gunshot Wound of Neck: Arterio-venous Aneurysm of the Left Common Carotid.*

The bullet had traversed the left side of the neck horizontally at the level of the cricoid, leaving a perfectly clean wound. The man came under my notice about three weeks after being wounded, when there was a visible pulsating swelling, with its greatest prominence in front of the anterior border of the sterno-mastoid. The swelling presented the usual signs of an aneurysm, including a loud bruit, which ceased on pressure being made at the root of the neck.

Operation.—A long incision was made over the anterior border of the sterno-mastoid, and deepened until the internal jugular vein was exposed. The vein was enormously distended, having a diameter of 2 in. No doubt the division of the fascia had allowed it to expand to an extent greater than before the disturbance of the parts. There was a communication between it and the internal carotid just below its division. The internal carotid was clamped with a guarded pair of forceps with a view to seeing if the communication could be closed. However, although this proceeding lessened the tension in the vein, it had no effect on its size, and this, coupled with the dense cicatricial tissue of the bullet track, prevented a safe exposure of the main vessels. The vein was accordingly divided and tied. The clamp on the common carotid was removed, and the vessel ligatured in two places and divided between them. A somewhat difficult dissection exposed the external and internal carotids. These were ligatured at their origin from the common trunk.

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CASE II.—*Gunshot Wound of Neck: Dissecting Aneurysm of the Left Common Carotid Artery.*

The bullet passed from a little below and behind the mastoid process to a point on the left side of the trachea at its commencement. The entry wound was clean and newly healed when he came under observation, but there were signs of inflammation round the bullet. This case differed in appearance from the last only that the swelling steadily increased and was more tense.

First Operation.—The bullet, which was found lying in a little pool of pus, was extracted. The wound was left open, and at the end of a week was reasonably clean and nearly healed; the steady increase of the aneurysm, however, necessitated interference.

Second Operation.—A similar incision was made and gradually deepened until the sac of the aneurysm appeared. It was roughly fusiform, and extended from 1½ in. above the clavicle to somewhere about the level of the lower jaw. Its upper limits were not investigated. The sac was perilously thin, and appeared to consist only of some of the outer coat of the artery. The internal jugular crossed it somewhat far back. It was firmly adherent, so that the main bulging was directly forward. In order to reach the common carotid in the little available space above the clavicle without dragging on the vein, it was necessary to divide and tie the vein below the sac. The tying of the carotid was then begun; during the process the sac burst spontaneously in its upper part, and a high pulsating jet of blood shot up. A swab was pressed on the hole and controlled the bleeding. The tying of the carotid was then finished. On removing the swab for a moment the jet of blood was in no way diminished, but had lost its pulsation. The sac entirely overlay the external and internal carotids, preventing any search for them, so two swabs were placed on the hole in the sac and pressure maintained on them by sewing the inner edge of the carotid sheath firmly to the edge of the fascia covering the sterno-mastoid. This proceeding stopped the haemorrhage for the time being, at any rate, and the wound was closed.

Third Operation.—No signs of haemorrhage having occurred after the second operation, the wound was reopened five days later and the swabs removed. The sac had been obliterated entirely and no haemorrhage occurred. The wound was reclosed and a small drain put in the lower angle of the wound to give early warning of any bleeding.

Both patients were young men of nineteen or twenty, and made uninterrupted recoveries. Case I complained of headache for three or four days after his operation, but otherwise neither of them showed any sign or symptom of being the worse for the loss of both arterial and venous channels on the one side.

My best thanks are due to Colonel G. St. C. Thom, A.M.S., D.D.M.S., N.R.E.F., for permission to publish these cases.

TRAUMATIC RUPTURE OF THE SUBCLAVIAN ARTERY: DEATH NINE DAYS LATER.

BY

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THE following is an account of a case of sufficient interest to warrant publication on account of its rarity.

Semenko, a Russian mechanic belonging to H.M.S. *Josephine*, was admitted to the 53rd Stationary Hospital, Archangel, in the evening of October 4th, 1918.

History.

He was on board a small tug which was coming alongside one of H.M. ships, and was warding it off from the ship's side. To do this more effectually he had the boat-hook against the ship's side, and the near end of the pole placed under his left clavicle. He was leaning on the pole. Unfortunately for him the wash of a passing vessel caught the tug and threw it towards the ship. Immediately behind him was the cabin of the tug; he was therefore caught between the cabin and the end of the boat-hook, which pinned him to the wall of the cabin. When the swing of the boat was over he dropped on deck. The doctor of the ship was called, and he was seen also by Colonel Ormrod, R.A.M.C., who sent him up to the stationary hospital at once.

Complete absence of all pulse at the left wrist was noted. Morphine had been given to him before removal.

and his arm was secured to his side. He arrived in hospital about one and a half hours after the accident.

Condition on Admission.

He was suffering from severe shock, and was very restless. There was a large non-pulsatile swelling over the left clavicle, extending up into the neck. There was no pulse at the left wrist. He was markedly bloodless; the whole of the left side of the chest was dull, and respiration could scarcely be heard. He appeared to be moribund.

Diagnosis.

Injury or destruction of the subclavian vessels, with bleeding into the left pleural cavity.

Treatment.

It was a question whether to let him die quietly or to operate in the forlorn hope of being able to do something to save him. Eventually it was decided to operate. The electricity of the hospital suddenly gave out, which rendered matters more difficult, but an acetylene operating lamp was at hand, and an electric lamp was run off the x-ray plant next door by the ingenuity of Captain Cotter, R.A.M.C.

A light general anaesthesia was given. A long incision was made over the swelling above the left clavicle. As soon as the fascia was opened a large quantity of blood gushed out. A finger was at once inserted to control the artery against the first rib. Both the first and the second ribs had disappeared, and could not be felt with the exception of loose fragments of bone. The artery, however, was found at once, the end sticking up into the wound like a finger, pulsating feebly, completely severed. Whether it was bleeding or not at the time was not discovered. It was grasped at once with powerful forceps, which were left on. The distal end of the artery could not be found, and nothing could be made out with regard to the vein. Nothing could be seen as the field of operation was awash with blood. The wound was sewn up, and the artery forceps left protruding from the wound. The operation took a very few minutes. During this time saline was being given into a vein, two pints were run in, and he was left undisturbed on the table till his pulse had recovered some strength. He was then put back to bed, and more morphine given.

After-History.

More morphine had to be given during the night, but even then he did not sleep well and was very restless. Next day, however, he was much better, and we entertained hopes of being able to save him. He was very restless for the next two days. The foot of the bed was raised high upon blocks, and this seemed to worry him and keep him awake.

October 6th, 1918. He was dressed and the forceps removed from the artery. A long rubber tube was inserted into the wound and $1\frac{1}{2}$ pints of fluid blood siphoned out of the pleural cavity.

October 7th. He was dressed again and half a pint of blood withdrawn from the chest in the same manner, the bed being tilted to an extreme angle to allow this to be done more effectually. His arm was unfastened from his side and disinfected, after being washed, as gangrene of the arm was feared. The lower limbs were bandaged. He was constantly receiving saline by the rectum, and took a good deal of fluid by the mouth. Morphine seemed to have little effect in controlling his restlessness, and he was now given hyoscine in $\frac{1}{100}$ grain doses. He passed a better night, but showed signs of renewed haemorrhage next morning.

On October 8th he had torn off his bandages in spite of the special orderlies, and got his arm free, and was very restless and anxious about himself, continually asking if he was going to die.

On October 9th laudanum m 30, with potassium bromide gr. 45, were given and he passed a slightly better night, but managed again to free his arm, which he waved about wildly. The forearm was very swollen and tender. There was no sensation below the elbow. It was thought that a line of demarcation was forming below the elbow. The arm was again disinfected and put into a clean sock.

On October 10th his condition was much the same, but he was showing signs of exhaustion as he would not sleep, in spite of everything we could do. Morphine and bromide had been repeated with little effect; he was continually restless and a very bad patient.

On October 12th his condition was worse. The heart seemed pushed slightly to the right, and he was breathing badly. He again tore off the bandages from his arm, and this time from his wound as well. Hyoscine was given with very little effect.

He died of exhaustion early on the morning of October 13th. He really never gave himself a chance throughout.

Post-mortem Examination.

The left clavicle was found unbroken, as had been noted at the operation. The pole of the boathook had been thrust in below it. The first rib was broken far back, and detached from its cartilage at the sternum. The loose fragment had rotated inwards transversely. The second rib was broken and detached from its cartilage half an inch from the sternum. The artery was completely severed, evidently by the broken ribs, probably the first, as it rotated inwards. The crushed proximal end was completely occluded; the distal end was full of firm clot. The vein was not torn. The left lung was collapsed, and the pleural cavity still contained much blood.

It is my opinion that this man's life might quite well have been saved if he had been more reasonable and more amenable to treatment, in spite of the severe injuries he had sustained.

THE BALANCE OF COLLOID AND CRYSTALLOID IN CHOLERA, SHOCK, AND ALLIED CONDITIONS.

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THE JOURNAL of September 20th last (pp. 387, 394) contains two articles of first-class importance which come from sources so wide apart as France and India, and are recorded independently, but they shed such a light upon each other, and upon several outstanding obscure facts in the study of immunity, that it seems worth while to bestow some thought upon the underlying common cause of the whole series.

The first is a review of recent work by Richet, Brodin, and Saint-Girons¹ on anaphylactic shock, in which it is shown that such shock can be prevented by addition of sodium chloride to the dechaining dose of serum, or by rendering the blood hypertonic with saline before this serum is injected.

The second is a letter from Sir Leonard Rogers pointing out that while intravenous injections of hypertonic salines in cholera are of well-proven advantage similar injections of gum arabic as used by Bayliss so effectually in combating wound shock, or surgical shock, are here of no avail but rather appear to be a disadvantage.

Now these two sets of observations are by no means contradictory but most beautifully complementary, also both are in consonance with the findings of the French school on anaphylaxis and, as will be shown, with the earlier observations from India of Sutherland and McCay² that hypertonic salines inhibit haemolysis either in a natural haemolytic system or an actively created one with a specific haemolysin, as in the Bordet-Gengou reaction and the Wassermann test.

The common cause of all these phenomena is a disturbance of that delicate equilibrium between the colloids of the blood and cells (such as proteins and lipoids) and the crystalloids (such as sodium chloride) existing united or adsorbed in common solution or suspension.

Taking, first, the positive effect of a colloid, such as blood-proteins, gelatine, or gum acacia, in shock due to haemorrhage, surgical injury, or prolonged anaesthesia, as compared with the failure of simple hypertonic salines under these conditions, we find that the situation is one of a circulating fluid not merely defective in total volume but also relatively poor in colloid compared to crystalloid. Accordingly inorganic salts, or salines, given alone are here rapidly eliminated, having no colloid to anchor them, and so being treated as foreign bodies and thrown out by kidneys and intestine. But gum arabic, gelatine, and plasma proteins cannot be so expelled, and serve to anchor inorganic salts and so preserve the equilibrium of crystalloid and colloid not only in blood but in the master cells of brain and heart, where the state of aggregation of the protoplasm would soon become altered.

That there is such an interaction of adsorptive character between colloid and crystalloid is shown clearly by the definite changes in osmotic pressure following upon variations in the concentration of the salines in which the colloid is in solution. This osmotic pressure measures the degree of aggregation of the colloid, and the same colloid may show a ten-fold variation with varying concentrations