point of entrance of the bullet on the abdomen of a male body, and the opening behind at which it was extracted, I passed a sharp-pointed weaver's spindle directly through the cavity of the abdomen, causing it to enter and emerge at the points indicated. On opening the abdomen, the following points were observed. The instrument, after passing through the parietes, had entered the cavity of the omentum, just below the curvature of the stomach, and at some little distance above the transverse colon. Passing through the posterior wall of the cavity, it transixed the coats of the bowel just above the junction of the duodenum and the jejunum; but the cavity of the bowel was not opened. The slightest deviation to the right would have perfectly avoided the viscous. It then entered the psoas, escaping the pancreas, which was some little distance above, and the kidney, which was situated to the left. Since the ball struck a transverse process, and lay—I think you said—a little internal to your incision, the duodenum would have completely escaped. This investigation may not go for much; for one cannot assume that the position of the parts as found after death—flexed and non-distended—are in any way a representation of the structures as existing in life. Still, I think the fact interesting, that the spindle should have passed right through the cavity of the abdomen without penetrating the interior of any viscous or injuring any important organ. It at least demonstrates the *practical* possibility of such an event taking place during life, and no doubt supports what you have suggested as the probable course of the bullet.

Almost all writers on gunshot-wounds assert that, in many instances, a projectile perforating the skin of the abdomen has been deflected and has pursued a circuitous route to its place of exit or lodgment; and also that the track can be made out by certain signs, as tenderness, swelling, discoloration, and prolonged discharge, which frequently follows gunshot-wounds, although these may at times be trifling; also that occasionally the distance travelled has been half the circuit of the body. The records of the American and Franco-Prussian wars re-establish the statement; yet I can find few well authenticated examples of it. And I have not found one of a bullet entering near the umbilicus and making the half circuit of the trunk. I believe it to be possible that a bullet may perforate the skin near the umbilicus, and, if very oblique in direction, may be deflected, and pursue a course round the body subcutaneously; I also believe it possible that a bullet coming very obliquely might perforate the sheath of the rectus, enter the substance of the muscle, again perforate the sheath anterior to the plane of the abdominal aponeurosis at the linea semilunaris, and, as before, travel round in the abdominal wall. But, in both of these instances, the superficial track of the bullet must be evidenced by some of the signs indicated by those who have mentioned the subject.

In the case here recorded, I think there can be no doubt that it is an example of a direct penetrating wound of the abdomen, without injury to any of the viscera.

I believe that the bullet, having traversed the abdomen, perforated the psoas muscle, just above the transverse process of the second lumbar vertebra. The immediate and continued pain in the front of the left thigh, causing the patient to draw it up, indicates injury to the anterior lumbar nerves, which are imbedded in the psoas muscle; and the small putrid abscess, which was found just in front of the transverse process, almost certainly proves this.

The whole of the symptoms are very similar to those described by Bell, in his *Discourse on Wounds* (part ii, page 630), in reference to penetrating wounds of the abdomen, when the ball injures the psoas muscles.

Having struck the tip of the transverse process, it was suddenly turned on itself and deflected over, and lodged close behind the transverse process, with its point downwards, its base up. That this was its course was manifest to me, because my finger easily slipped through a hole, above the tip of the transverse process, into a small abscess cavity in the substance of the psoas.

I did not feel, and never noticed, in the discharge, any crumbs of broken bone; but the bare bit of bone at the tip indicated that some minute fragment had been chipped off; and this was sufficient to account for the occasional little suppurations at the bottom of the wound, which, I have no doubt, were the cause of the long-continued and remitting febrile symptoms. Several times, during the first two months, there was some gastric and intestinal disturbance, which gave me some anxiety as to the possibility of peritoneal complications; but I now believe them to be due to the suppurations referred to, which occurred after the removal of the drainage-tube, when all discharge seemed to have ceased.

SEQUEL. February 23rd, 1883.

Mr. M. having returned to Glasgow, this morning, with his cordial

assent, I examined him in presence of my clinical class. He is in robust health, and has all the appearance of a vigorous, active young man. Not a trace remains of the various symptoms which troubled him during his tedious convalescence. I carefully examined him, by questioning, as to all the points previously detailed; and, these being now corroborated by the evidence of the patient, I was confirmed in my opinion as to the course of the ball. The aperture of entrance is now a flat, circular cicatrix, exactly three and a half inches above the umbilicus, and one inch to the right of the middle line. The incision by which I excised the bullet is now a cicatrix, about two and a half inches in length, and about two inches to the left of the spine of the second lumbar vertebra. It is much depressed in the centre, and fixed down by strong cicatricial tissue.

Reverting to the whole of the circumstances, as elicited by narrative and cross-questioning in presence of the students, I have no doubt whatever that the bullet penetrated directly through the abdomen.

CASE OF GUNSHOT-WOUND OF NECK, WITH PERFORATION OF OESOPHAGUS: RECOVERY.*

By D. ALLEN CHARLES, M.D., Bellaghy, co. Londonderry.

JOHN M., aged 18, weaver, became a patient of mine under the following circumstances. On the evening of April 7th, 1881, he was sitting before the fire with a pistol in his hand. The pistol was loaded with two slugs, which he had made by hammering the lead into solid pellets. Thinking something was wrong with the percussion-cap, he attempted to fix it with the point of a scissors, the muzzle happening to be directed towards his face. The weapon suddenly exploded, and, feeling a sharp sting in the neck, he fell on his back. He was able, however, to rise immediately, and, a neighbour having come to his assistance, I was sent for. Not being at home when the messenger arrived, three hours at least elapsed before I saw the patient. I found him calm and collected, and able to give the above history of his case.

He complained much of pain between the scapula, and at the epigastrium, especially if he attempted to swallow. He had no cough or vomiting, but immediately after the accident he spat up a few mouthfuls of blood. His respiration was regular, and his pulse 80. On examination, I found his face and neck much blackened with powder, and there was some slight cedema of the neck, with two wounds at the base antero-inferiorly. One of these wounds was a simple contusion of the skin over the junction of the lower and middle thirds of the left sterno-mastoid, while the other was a perforating one, situated at the apex of the left anterior triangle, about one inch and a half above the sternum—the latter barely admitted the tip of my little finger. There was a little blood trickling from it, but the hæmorrhage seemed to have been small. Having enlarged the opening, I explored the wound with my finger, and found that the slug had entered between the tendon of the sterno-mastoid muscle and the trachea, but without injuring either, and had then taken a direction downwards and backwards. I could trace its course with my finger for about an inch, but, by means of a probe, for upwards of three inches. I explored gently for some time, but without discovering any trace of the bullet; I, therefore, gave over any further attempts; but that the oesophagus was perforated, I was led to believe from the spitting of blood after the accident, and the subsequent difficulty in swallowing. I had no alternative, therefore, but to watch the case, and let nature take its course. Accordingly I dressed the wound with carbolic oil, covered all with a pad of fine oakum, and gave a draught of ammonia and henbane. Next morning I found he had passed a fair night, but he was still complaining of pain in his shoulders, and of difficulty in swallowing. Pulse 104, temperature 101.5°, respiration 28. I made a further and last attempt to trace the bullet, using a silver catheter for a probe, but without success. I determined, therefore, to keep the wound clean, and to put the patient on milk diet.

April 11th.—He felt much easier; pain in the shoulder and difficulty in swallowing were still present. He had some substernal pain. Pulse 116, temperature 102°, respiration 28. The tongue was furred, the bowels were confined.

April 14th.—He felt well until yesterday, when he began to have pain in his jaws and neck. He could swallow better; pulse 100, temperature 104°, respiration 28; tongue moist; the bowels were open yesterday; the motion was black and tarry. The wound was

* Read before the Annual Meeting of the North of Ireland Branch.

clean and almost closed; there was no discharge, no cedema; he had darting pain in the left ear, and much thirst.

April 17th.—He had a severe rigor last night, which lasted for a considerable time, and was followed by profuse perspiration. Pulse 100, temperature 99.4°. The tongue was furred; the wound was discharging thin foetid pus. Enlarging the opening, I syringed the wound with carbolic lotion, and put the patient on sulphate of quinine, and tincture of the perchloride of iron.

April 19th.—He had had no rigor since the 17th; pulse 82, temperature 100°, respiration 26. On the evening of the 17th (tenth day after the accident), the patient noticed that the discharge from the wound began to increase, especially when he was swallowing his milk. The wound looked clean, but the dressings were soaked with discharge, and a creamy-looking fluid was coming away. I gave the patient a drink of milk, and found that pure milk came away from the wound. I then tried water, with the result that the discharge became clear. There could, therefore, no longer be a doubt as to the existence of an opening into the œsophagus. The patient had no pain in his shoulder unless when lying on his back. I determined to continue the dressings as before, but to change them more frequently.

April 22nd.—He had, unfortunately, got an attack of bronchitis, the cough being very hard and troublesome; pulse 84, temperature 100°. The discharge from the wound was considerable. There was much exuberant granulation around the orifice. I prescribed ammonia, squill, and bark.

April 26th.—He was feeling better. The cough was not so troublesome. His appetite was improving; bowels regular, tongue clean. He had copious perspirations. He slept well; had no pain unless when lying on the left side. The wound was clean, with little discharge, and this not increased by drinking. He had no difficulty in swallowing; pulse 84, temperature 99°. I prescribed dilute sulphuric acid with quinine.

April 30th.—He was much better; the copious perspirations had ceased, and there was no discharge from the wound. I touched the granulations with nitrate of silver. The patient could not yet swallow solids without experiencing pain. He had some pain in the dorsal region of the spinal column on the 27th, but this had now disappeared; pulse 100, temperature 98.6°. After this date, the patient walked on two occasions into the dispensary for examination, a distance of six miles. The granulations formed a kind of bag or cyst, two inches long: but, after being ligatured at its base, it dropped off, leaving the wound quite healed. I have seen the patient frequently since, and he is now pursuing his usual occupation of weaving, suffers no pain, and has not the slightest difficulty in swallowing solids or fluids.

REMARKS.—The points of interest in the case are many. I shall particularly refer to a few of them: for example: 1, the readiness with which the wound of the œsophagus healed, even under the disadvantageous circumstances in which the patient was placed; 2, the probable fate of the slug; 3, the comparative safety of such injuries, notwithstanding the rich supply of large blood-vessels in the part; and 4, the possibility of a subsequent stricture of the œsophagus.

1. That there was an opening into the œsophagus, I think there is every reason to believe; and, also, that this was caused by the direct entry of the slug, and not by any subsequent ulceration. There was hæmorrhage from the œsophageal wound, as indicated by the vomiting of blood immediately after the accident, and the subsequent discharge of blood by the bowel. The original opening was evidently a small one, as it was not until the tenth day after the accident that any food was noticed to escape by it; so it is probable that the original opening was in some way increased in extent, possibly from slight softening or ulceration. This opening closed up about the nineteenth day.

Longmore, in Holmes's *System of Surgery*, refers to similar cases, in which recovery occurred after five days in one, and twenty-six days in another. In such injuries, there is a liability to concussion of the vertebral column, and to injury of the deep-seated nerves, attended sometimes with loss of power in the arm; extensive paralysis even may set in after some time. But our patient fortunately escaped these risks, and I ascribe this to the comparative slightness of the shock caused by the slug—it being light, and of small size.

Care, however, should always be taken to allow the wound to heal from below. The advantages of this plan of treatment are obvious. It is the course to be followed in all penetrating gunshot-wounds, and much more is the same plan to be pursued in such a case as the present, where we have a hollow organ like the

œsophagus wounded, from which food, in its passage along that canal, is so liable to be extruded.

Wounds of the œsophagus from within, such as rupture and the like, without any communication with the exterior, are often very dangerous, sometimes even fatal in their consequences. But, on the other hand, wounds from without belong to a different class entirely. Our object, therefore, must be to prevent a case of the second class from being converted into one of the first; that is, the orifice into the œsophagus must be closed before the rest of the wound is allowed to heal by granulation.

2. One of two things must have occurred to the slug: it may either have penetrated into the œsophagus, and then have been discharged through the intestine; or it may still be lodged somewhere deep in the tissues of the neck. We know that it is possible for foreign bodies to become so invested by organised lymph as to give rise to little or no irritation in the living tissues in the neighbourhood, and so cause no inconvenience. At any rate, the slug was never discovered, nor have there been any indications hitherto pointing to its lodgment.

3. Longmore points out that, during the Crimean War, the mortality of wounds of the neck among the English soldiers only amounted to 4.08 per cent., while among the French it amounted to 26 per cent. In the American War, it was 14 per cent. Even 26 per cent, is not such a high mortality if we take into consideration the important organs and vessels that are so superficially placed in the neck, and accordingly so exposed to injury. As Longmore, however, remarks: "In no region are so many examples offered of large vessels meeting, but escaping from balls in their passage, as in this, because the cause which operates elsewhere—ready mobility among long and yielding structures—exists in a greater degree in the neck than in any other part."

4. I cannot find any records as to the occurrence of stricture after gunshot-wounds of the œsophagus; but, so far, my patient has made no complaint of any kind pointing in this direction, and it is now over twelve months since the accident happened. The possibility, however, of such an occurrence, I should say, would greatly depend on the extent of the injury. Where the wound is extensive, I should be disposed to regard stricture as a likely occurrence; but where the extent of the injury appears to be slight, as in the case in question, I should be inclined to regard its appearance as very unlikely.

NOTES OF CASES OF DILATED STOMACH: WITH REMARKS.

By T. SANCTUARY, M.D., Hayle, Cornwall.

CASE I.—The patient was a spirit merchant, aged 40, who, according to his own account, had enjoyed good health up to August 1879. He consulted me in February 1880, for "wind in the stomach and sickness after eating." The general and family histories were good. He had been a full liver, and a regular and moderate drinker of stimulants, taking his glass of toddy at night and a couple of wineglasses of sherry for dinner. He had a pale, flabby tongue, indented at the edges, and a good deal furred at the back part; his teeth were much decayed, his expression careworn, and his complexion withered and sallow; his bowels were constipated, the nervous system greatly depressed, and general nutrition poor. He told me that he noticed his appetite fail him first about the end of July 1879, and he then began to feel "a fulness" at the pit of the stomach. Of late his appetite had become very capricious: sometimes he felt a craving for food, at others the thought of it produced a feeling of nausea; but invariably, an hour or so after eating, he was seized with a violent attack of vomiting, and pain in the stomach, and all he had eaten was rejected, together with more or less sticky phlegm. The vomiting was not altogether dependent on the ingestion of food, as it sometimes occurred when no food had been taken previously. He had lived for the last six months chiefly on raw eggs, milk, and cream, with some iced water or claret to allay the excessive thirst from which he suffered. His height was 5 ft. 11 in.; weight 130 lbs. He said that he weighed 170 lbs. in June 1879, and he was now feeling the diminution a good deal, and was fully conscious of his emaciated appearance.

From his appearance and symptoms, malignant disease of the pylorus at once suggested itself to me. I examined him carefully, and fancied I could feel a hard lump in the epigastrium; there was a diffused tenderness in the stomach and adjacent parts, but no specially painful spot anywhere. On percussion and auscultation, I discovered that the stomach presented a very curious phenomenon. The patient