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PART I.
ORIGINAL COMMUNICATIONS.

ART. IX.—*Reports in Operative Surgery—Remarkable Cases of Gunshot Wounds.* By RICHARD G. BUTCHER, M.R.I.A.; Honorary M.D. of the University of Dublin; Lecturer on Practical and Operative Surgery in Sir Patrick Dun's Hospital; one of the Examiners on Surgery in the University of Dublin; Ex-President of the Royal College of Surgeons in Ireland; Fellow, Licentiate, and Member of Council of that Body; late Senior Surgeon to Mercer's Hospital; and Lecturer on Clinical Surgery, &c.

I HAVE great pleasure in laying before the profession the following cases of gunshot wounds. They will, I consider, be found replete with interest to the physiologist, as well as to the practical surgeon, be he civil or military. I need not say with what anxious solicitude the lives of these two men, the subjects of these remarks, were watched over by a sympathizing and deep-feeling people. The repeated inquiries at Mercer's Hospital, early and late, by rich and poor, without distinction of creed, bears ample testimony to the unusual anxiety elicited in their behalf; from the manner in which their death-wounds were inflicted by the assassin, while in the

discharge of their trying and onerous duties as public officers. Though appealed to frequently to place on record the history of these remarkable cases, yet I declined to accede to the request, or to do so prior to, and while pending, the trial of a man suspected of the offence, but which case has now been adjudicated upon. From this cause alone I refrained from making any observations on the cases, knowing well the clemency of the Crown, sanctioned by justice, has ever been, as now, to favour mercy. The first case is remarkable from the terrible severity of the symptoms, and the rarity of injury to vital parts here struck, viz., the splitting of the right semilunar ganglion of the sympathetic system, and the breaking up of the solar plexus of nerves, together with the opening of the side of the inferior vena cava, the profuse escape of blood from it, and yet the hemorrhage arrested—life being preserved for many days—a week—by judicious management. The second case affords a fine illustration of the power which practical surgery possesses in saving life.

CASE I.—Gunshot Wound about Three Inches below the Ensiform Cartilage; the Right Crus of the Diaphragm and Semilunar Ganglion of the Sympathetic Split by the Ball, and the Solar Plexus of Nerves broken up; the Side of the Inferior Vena Cava being opened, with a profuse escape of Blood, yet Life preserved for many Days—a Week. Post Mortem Examination revealing the Locality of the Ball.

Police constable Patrick Kenna, aged twenty-eight years, was admitted to Mercer's Hospital under my care, October 31st, 1867, at a quarter past one o'clock, after being shot whilst on duty. The man believing that he was dying immediately after coming into the hospital, made the following depositions to a magistrate, and which tells his history as follows:—

“I, Patrick Kenna, Police Constable of the Dublin Police, believing myself to be in immediate danger of death, make this my dying declaration as to the cause of the condition in which I am now in—that about a quarter to one o'clock this morning I was standing at the corner of Essex-quay, near Mason's shop, when I saw a man at the opposite side, near the bridge, and as he seemed desirous to avoid me he attracted my attention; he passed across to the flagway of Wellington-quay; he had a whitish-coloured bundle under his arm; I called after him to wait, and he said, ‘I won't,’ and I followed quickly after him, and when about Duffy's

shop I overtook him I said, 'I will make you wait,' when he turned round, and when about a yard from me he presented a pistol and shot me in the belly; I wheeled back towards the bridge, and shouted and met a constable named John Hickey, who put me on a car and brought me here. Delivered at Mercer's Hospital, the 31st October, 1867.—PATRICK KENNA."

"The above dying declaration was made in my presence at four o'clock, a.m., at Mercer's Hospital, on the day above stated.—C. J. O'DONNELL, J.P."

On admission the patient was a pitiable spectacle—pale, haggard, wild looking; pale as death; greatly excited; tossing his hands and arms about, and screaming if it was possible he could recover. The body was cold; pulse feeble; and I never will forget the bewildered look of despair in which he implored to be rescued from pain—from the burning agony with which he writhed. On stripping the man, I found a small transverse wound about three inches below the extremity of the ensiform cartilage, exactly in the middle line. The wound was said to have been inflicted by a pistol ball, yet it had the exact appearance as if made by a worn shoemaker's knife; after such an instrument I have often seen similar wounds, and very like. The inversion of the edges was scarcely appreciable, it being so very minute; there was no laceration of the edges, or the least trace of discolouration; as I have said before, it resembled an incised wound. It was about three-quarters of an inch in length, and its long axis strictly transverse. There was no blood trickling from it: a few drops had stained his shirt; but all had ceased at this time. I cleaned the wound and parts around with a damp warm sponge, and there was, even then, no more weeping from it. As the poor fellow lay in the horizontal position in bed, stripped, I passed my hand gently over the region of the wound, and examined carefully all around the loins and back, to discover if possible the course of the bullet, but all in vain, and there was not a scratch upon his body but the one small sharp cut. It was a terrible thing to behold this strong man stretched there, screaming in agony, with this death-wound, inflicted only a few minutes before. Of course the idea of probing the wound was never entertained for a second, or any meddlesome interference. Suddenly the creature would jump up in the bed; again assume the sitting posture in it, with his legs drawn up, and his head drooping forward over his knees. During these writhings he

pressed away every one who approached, and would not suffer restraint. Heated jars were applied along the limbs and to the feet, and he was propped up by a bed chair after a little time, and warm stimulants and sedatives given. So low did his pulse at this time fall that quick repetition of stimulants was essential to sustain the heart's action; brandy and opium every two hours; a few grains of calomel were placed upon his tongue.

November 1st, 9 a.m.—Found the patient somewhat quieter as to pain, but vomited frequently dark green matter; pulse very feeble, yet soft; the same wretched anxious countenance, and a constant craving to cool his throat, and the “rasping feel” in it; he dozes for a few seconds, still every two or three minutes starts up alarmed, and asking if possible “to save his life;” slight pain referred to the lower part of the belly; but none to the wound or its locality; the wound looks just as on his admission—a mere transverse slit, apparently with no irritation or even life about it; bladder full; drew off with silver catheter fully a pint of naturally coloured urine, with, as he said, relief of the uneasiness in the pubic region; however, ordered—from the wound downwards and laterally to either iliac region—the belly to be stuped with flannels wrung out of boiling water, and sprinkled freely with laudanum; ordered a grain of calomel and a grain of powdered opium every second hour, and one ounce of brandy and twenty drops of laudanum every second hour; cold chicken jelly and beef-tea jelly in spoonfuls occasionally; hot jars to the feet. 12 a.m.—Quieter then in the morning; pulse fuller and steadier; heat of body very low; anxious expression of countenance as at first, and general restlessness persistent to gain a “better position;” however he is alive; to continue the stimulants; smeared over the lower part of the belly with mercurial ointment, over which the laudanum stupes to be continued. 3 p.m.—Stomach ever irritable and vomiting; ordered two drops of medicinal hydrocyanic acid to each dose of brandy and laudanum every second hour. 8 p.m.—Still in same restless watchful state; starting up rashly and suddenly, sometimes even with a scream from sudden pain deep beneath the wound; to continue everything. 11 p.m.—Somewhat quieter than at last visit; remains recumbent, and under control; pain abated. To continue medicines, stimulants, stupes, &c., all through the night; bladder again relieved of a pint of water; states himself voluntary that he knows he could make water, but the fear of hurting his belly prevents his attempting to do so; he has full power in the lower

extremities, both in sensation and motion, as evident by his occasionally starting out of bed, and walking a few steps before being controlled, without unnecessary violence.

November 2nd, 9 a.m.—Has had but little sleep; the same anxious watchful eye; pulse now up to 98, but no force or strength in it; the man is quieter, and not suffering such acute pain; vomiting occasionally, but above all things complains of the “tearing in his throat;” jactitation; the arms frequently thrown across the chest; and seeking for aid to the “internal feeling,” deep in, that he cannot describe, except as “tearing him.” This same terrible feel extends up the entire throat; urine passed this morning in full quantity by his own efforts, proving at once no nervous lesion of the spine. In addition to the plans laid down, stimulants, mercury, stupes, &c., added iced champagne when he wished for it, and a drop or two of hydrocyanic acid in it, according to time; pieces of ice to be placed constantly in his mouth to assuage the parched feel; and nutriment in the same concentrated nutritious forms to be frequently given. 12 a.m.—Heat of body now at its natural temperature, and the circulation established throughout thoroughly, but not in deranged inflammatory impetus. To continue everything as ordered in the morning. Visited at 3, 8, and 11 p.m.—No marked change.

Nov. 3rd.—Condition much as on yesterday; the most distressing vomiting, somewhat mitigated by the application of a dozen leeches a little above the wound; slight tenderness in this region having called for their adoption, and the pulse, by its character, not contra-indicating this local abstraction of blood; the same wretched excited look, and emaciated pinched features. In the after part of the day he seemed quieter, and had some sleep. The *cannabis indica* in conjunction with the opium was freely exhibited throughout the day, and evidently towards night had produced more composure. The calomel and opium was steadily administered, and also the opiate stupes and mercurial inunction over the abdomen. Stimulants—brandy in iced water, champagne iced, meat jellies cold. Visited five times, and apportioning means according to symptoms.

Nov. 4th.—Has had short sleeps through the night, occasionally waking with a scream from pain referred to deep in the wound; vomiting at short intervals; took, however, all his medicines; stimulants, &c., at regular periods; pulse 110, very soft and feeble. 3 p.m.—He has the same restless stare and wild look which he has

had since his admission, with frequent vomiting of small quantities of yellowish watery fluid. To this colour it has now changed from dark green, and even black, sometimes harassed with the most violent straining, without ejection of any fluid, and, as the creature describes it himself, as an effort to get rid of the "gnawing and tearing" in his throat the entire way down. When this sensation was fully upon him, I have seen him to grip the throat, and, as he expressed himself when the paroxysm was passed, "he could tear out the piece;" jactitation frequent and prolonged. I applied bladders of ice along the spine and over the wound, and the regions in its vicinity, with some apparent relief; urine passed in full quantity, and by the natural efforts; bowels moved freely by the small doses of the submuriate, dark fetid stools in large quantity. The foregoing was his condition from morning to night, during which time he was visited by me several times, and received unremitting attention and all observance from the pupils left in constant care of him. The fifth and sixth days were passed much in the same way, with the exception of the vomiting, which was not latterly so prolonged. The ice, too, after a time lost its effect, which was very marked after its first application, and on the seventh day the poor fellow lay comparatively exhausted; countenance visibly emaciated, and the same ghastly stare on it. Occasionally he makes the attempt to vomit, and suddenly rolling from side to side to get rid of the "feeling in his throat," constantly seizing on any one within his reach, and gripping him tightly down to him, supplicating assistance. Again turning partially over the side of the bed, with the head projecting over and downwards, then as suddenly flinging himself back, exhausted from his efforts. Thus he struggled on until ten minutes to three o'clock p.m., when he died just a week after the fatal bullet had stricken him. He raved for about ten minutes before death.

Post mortem.—Twenty-two hours after death, Nov. 8th, 1867, at half-past twelve o'clock p.m., before a crowded theatre of surgeons and students, assisted by Doctors Moore and Ledwich, I endeavoured at first to pass a bougie through the track of the wound, but the instrument was quickly arrested, owing to the contraction and subsequent narrowing of its course. Failing by gentle means to do so, I then slit up the abdominal wall through the linea alba from the ensiform cartilage to the pubis, and divided each lateral portion next by transmission from below the umbilicus backwards to the anterior edge of the quadratus lumborum muscle on either side. These

incisions were conducted with the greatest care, so as to guard against the slightest injury being inflicted on the parts beneath. On throwing back the flaps, formed after the manner described, the viscera were revealed, not puffed up, swollen or distended, but rather matted, or, as it were, agglutinated together by their own weight *en masse*. Evidently blood of a dark colour was extravasated largely and widely, not in fluid or coagulated masses, rather incorporated with all the tissues. This was the most striking peculiarity, and certainly a very unusual one, of the discolouration. Though the omentum was discoloured by this injection, and lay as it were in demonstration of its several layers and compartments, by the minute distribution and quantity of extravasated dark blood, yet these layers were not adherent to each other or the neighbouring surfaces, for the least effort lifted the omentum throughout its entire extent, and so likewise though the intestines were all livid, purple from the same cause, and steadily approximated to each other, yet they were not adherent. There was a dried condition of the opened surfaces of the small intestines, and though lying together as if *heavily*, not agglutinated by adhesive lymph. On lifting up the liver the under surface of its right lobe, close to its longitudinal fissure, was torn for about an inch in extent, not deeply, to about the eighth of an inch in depth by the passage of the ball; and from this it was reflected to the right kidney, which it broke up near its hilus, and then struck the right crus of the diaphragm, splitting it vertically (the stroke as if inflicted by a knife, so sharp and divided was the wound), and severing most important parts resting upon it. It was clearly demonstrated that the edge of the pancreas was cut, the right semilunar ganglion broken up in pieces, as well as several important nerves and vessels determined to this spot for communication and supply wounded; the bullet in its transit through the right crus of the diaphragm, cut the side of the inferior vena cava in its upward course, making an opening as if punched out, and in calibre about the size of a large goose quill, and from this great vessel flowed out so copiously the extravasated blood that coloured and permeated every tissue and recess that it could make by its steady flow and weight. The ball having passed through these vital parts, it entered, somewhat to the right of the median line, the body of the fourth lumbar vertebra, and passed backwards through its cancellated texture for an inch and a half, with a slight inclination to the right side, and made its partial exit in front of the right transverse process of this bone, where it lay. A probe passed

through the anterior opening, the slit in the right crus, detected the roughened bone beneath, and on being gently pressed passed into the aperture, detecting the bullet lodged deep beneath; the attachments of the *poas magnus* muscle on the right side being turned outwards, away with the greatest care and gentleness from its attachments with the bone and the corresponding one above and below, revealed the ball in its "*locale*." Where it stopped, a very small quantity of blood was thrown out around, and it appeared to me, from the ease with which the fibres of the muscle lifted up, as if they had receded from contact with the ball. The ball lay in its bed, and as it were ran its course till its force was expended; the apex of the cone of the bullet pointed backwards and to the right side, and was quite exposed to view, whilst its base rested concealed within the body of the bone, from which it had not passed. The bullet was of the minnie form, three quarters of an inch long, nearly half an inch in width, and in weight three drachms fourteen grains. The size of the ball in form accurately represented in the woodcut.

I removed the entire lumbar spine from the body, and have it in my collection, as well as the ball which inflicted the mischief. On careful examination of the bone it was quite clear that the spinal marrow or the canal in which it lay were not impinged upon, and indeed the perfect sensibility and power of motion which the man possessed in the lower extremities throughout the entire period of his life, lead to such an inference, which we perceive now confirmed by the *post mortem* examination as revealed.

I shall next detail the second case of severe gunshot wound which was admitted at the same time, on the same night, and inflicted by the same hand, and with the same murderous intent.

CASE II.—Gunshot Wound above the Ensiform Cartilage, attended by Numerous Complications—Inflammation of the Chest and of the Peritoneum—Profuse Intestinal Hemorrhage—Cutting out of the Ball from the Chest—Recovery.

Police Sergeant J. Kelly, aged thirty-three, was admitted to Mercer's Hospital on the 31st of October, 1867, with Constable

Kenna, at a quarter past one o'clock in the morning, after being shot on the same beat and in a few moments after. On his admission he was collapsed to the lowest degree; almost pulseless; tottering in his gait, even between the steady support of two powerful men who sustained him; his moans were subdued and altogether suppressed in a remarkable way. On his being questioned, his sufferings were not of that acute terrible description which harassed his fellow-sufferer, compelling him to scream out wildly, and even madly at times. On being stripped, and most carefully examining the body, no second wound could be discovered; and the point of entrance of the bullet was a small transverse slit, three-quarters of an inch above the extremity of the ensiform cartilage; the edges were not inverted, and were cut sharp; the wound was similar in every respect, save in position alone, to that inflicted on Kenna. It was situated also exactly in the mesial line of the body; from it, too, trickled a few drops of blood. There was no discolouration or any trace at all by which to mark the course of the ball; neither were there any peculiar symptoms by which to judge of certain injury to any particular vital organ. From the serious position of the wound, and the terrible collapse consequent upon its infliction, the magistrate considered it expedient, in this case too, taking his "dying declaration," which in words and matter almost exactly the same as that made by Constable Kenna, first shot. The same energetic means were put in force here as in the foregoing case: to restore the heart's action, and to uphold the sinking powers of life. Towards morning the pulse was steady in its beat, though exceedingly feeble, and even tremulous; the surface of the body was still cold and sweaty; and the same watchfulness, or rather seeming anxiousness in the eyes, a half-scared look. For several days his condition did not vary much from that of his injured companion; there was the same tendency to die by sinking and prostration; and there was the same energetic means, and constant applications of dry heat to the surface; the administration of stimulants and sedatives, &c., as often, and as persistently as symptoms would permit of; as in the former instance, so in this, the urine had to be drawn off, and so the bladder relieved. On the fourth day after his admission, and on the 4th October, I had the man removed to the next ward, bed and all, so he did not suffer the slightest shake or disturbance. I acted so, in order that he might not be a witness of the dying scene which just hung over his companion; he thus was saved, and escaped from the additional depressing agency of such a trial. The man was so little alive

himself, that he made no comment on the change of place, but lay calm and quiet, staring vacantly upon the ceiling. However, he was alive, and without any marked complications, though as depressed still, and sunken, as compatible with life.

5th November.—Up to this period the patient has been kept under the influence of small doses of calomel, and very large ones of opium; with the application of mercurial ointment over the abdomen and in the vicinity of the wound, with constant stupe cloths wrung out of hot water, with layers of French wadding, and oiled silk outside all; in this way early symptoms of inflammation and terrible pain in the vicinity of the wound and over the abdomen were averted. Evidently incipient inflammation of the peritoneum, and of the tissues in the track of the wound. Now the system was slightly touched, just ruffled by the mercury and the pain gone. Calomel was stopped, but the opium continued in grain doses of the powder every third hour, day and night, when awake. On the morning of the 6th of November, patient very restless; pulse throbbing, and flushed, particularly over cheeks and forehead; eyes very brilliant; and perpetual restlessness about the man. The cause was at once accounted for when I was shown pure arterial blood to about two and a half ounces, which flowed in a stream from the bowels; the sudden faintishness which came over the man, the nurse said, stopped it. This complication occurred only an hour before our morning visit, at 9 a.m. The explanation was taken, and so taken by me, that some large vessel, wounded at the time of accident, killed as it were, bruised or torn, never bled then, and so the depressed dying state of the man, favoured its being sealed up, not disturbed; and it was not till five days after, when some life was restored, when the heart began again to throw out its current a little more freely, and when the stream was a little stronger, that it overcame the blocked wound in the vessel, shoved out its retracted coats, and dilated its contracted fibres, and so liberated from the stricken deadened tissues of its tube, the artery allowed the blood to escape, pure oxygenated arterial blood. This bleeding, on the fifth day, of so profuse a nature, of purely arterial character, was certainly a most serious complication. When I had my patient only first alive, well then, I had to undo what I had been labouring for days to accomplish, when hoping was even against hope. I would here mark down and say how remarkably the complications of disease stamp their types, here in this sunken, prostrated, half alive creature, in a

few moments were lit up all the characteristics of the hemorrhagic tendency, the flushed face, the restlessness, the bounding pulse, through unfilled tubes; the throbbing main arteries of distant regions; and yet withal an occasional deep respiration, and often a succession of them, as it were, to give more capacity to the chest to constrain the return of that stimulus upon which its function seemed so dependant. Ordered a grain of opium, and three of acetate of lead every third hour; all drinks to be given cold; the brandy could not be dispensed with, and had to be continued in small doses, and in ice-water; ice to be constantly placed in the mouth to allay thirst; all warmth, stupes, &c., to be removed from surface of abdomen. 4 p.m.—Two considerable evacuations of pure arterial blood since early visit; heart still bounding, and pulse throbbing; ordered fifteen drops of tincture of digitalis every half hour, watching the pulse; to continue the acetate of lead and opium; no change of posture since the patient's admission. 9 p.m.—The patient has been very restless, with great heat of body; two large evacuations, nearly three ounces each of pure arterial blood. Now applied bladders filled with ice along the spine, from the middle of the dorsal region to the end of the sacrum; and, likewise, bladders filled with ice, were placed over the entire abdomen; continued the digitalis as before; and also the lead and opium pills; sips of cold chicken broth and chicken jelly given occasionally. Visited again at 1 a.m.; only one small arterial evacuation, about half an ounce since last visit, four hours past. Renewed the ice to the spine and abdomen; all other means to be continued; the digitalis in only ten drop doses; the heart being now quiet, and the heat of the body greatly diminished; the throbbing of all the larger vessels in the neck, temples, and arms, subdued.

Nov. 7, 9 a.m.—Had some sleep, and only one evacuation of blood, about an ounce; it was darker in colour, and a considerable amount of serous fluid making this quantity. The whole temperature of the body greatly reduced from the unremitting application of the bladders filled with ice; still to be continued, precautions being taken to interpose some linen between the bladders and the parts to prevent vesication, or, as might be, sloughing; stopped the exhibition of digitalis; altered the acetate of lead to two grains and a grain of opium every fourth hour; brandy with iced water; all nutritive drinks and jellies iced. Pulse is now calm, but very feeble, yet I dared not hurry the circulation or exalt the temperature, which will account for the line of treatment just laid down. The

wound has altered in its character; instead of being the mere slit which I described its character to be at first, its edges now have all changed both their shape and colour; the entire has assumed a circular form; the thin, sharp edges are dead and around for fully half an inch from the margins, while a wide, dusky-red circular patch, for nearly an inch beyond, bounds the circumference of this deadened portion. The changes in the vicinity of the wound were carefully watched from day to day, and gradually this remarkable alteration of appearance was brought about. The most gentle touch and well directed, throughout all this region and in its vicinity, could not detect any trace whatever of the foreign body that entered there; but gentle pressure below the wound and somewhat to the right side, could lift up as it were a few drops of pus from some deeper source beneath, evidently from the lacerated track through which the ball travelled. With this wound, from the very first, there was no meddlesome surgery, nor poking into it; it was subjected just as I have said to the gentlest touch, to try and discover whether any foreign body could be detected in its vicinity. In the treatment of it there was no traction excited upon its edges to solicit their union; the wound was left open, so that any matter secreted might well up from it and be expelled by the slightest cough or pressure, and this aid would insure its escape, and so prevent pouching. A soft, light linseed meal poultice was applied to the part morning and evening, so as to relax tissues. The man never complained of pain in the wound. 4 o'clock p.m.—But one very small arterial motion; dark fluid, with only a trace of bright blood through it; chest quite clear on percussion; to continue everything as ordered in the morning. 9 p.m.—No motion from the bowels since last visit; pulse quiet; all throbbing of the large vessels absent for some time; urine passed in full quantity; omitted the ice to the spine; continued it still over the abdomen; omit lead and opium pills, and ordered a grain of powdered opium every third hour; drinks and nutriment iced as before. 12 p.m.—Sleeping quietly; bowels undisturbed; pulse steady, but very feeble; no change in treatment.

Nov. 8th, 9 a.m.—Had a quiet night; two motions from the bowels—still arterial weeping, about half an ounce in each—a good deal of dark fluid besides; no pain, but patient lies perfectly restless; staring at the ceiling, and scarcely can be induced to take the trouble of speaking; ice applied in bladders again along the spine and over abdomen; to continue the opium, nutriment, &c. 4 p.m.—

Bowels quiet; has taken nutriment well; pulse steady and weak. 9 p.m.—No motion from bowels; remove ice from spine; to continue all other treatment.

Nov. 9th.—All bleeding stopped; one dark motion; pulse steady, but very feeble; wound presents no danger except the separation day after day of the sloughing edges; discharge in small quantity; quite healthy pus; it generally fills the aperture to the surface; does not run over, and even pressure on its circumference does not increase the flow more than a couple of drops, and that only when made in the direction I alluded to before. Ice still applied over the abdomen, and opium continued; diet also all cold. Visited 4 p.m., and at 10 p.m.—No change in symptoms or treatment.

Nov. 10th.—Slept at intervals quietly; pulse steady, feeble, 110; no bleeding or evacuation from the bowels; urine in fair quantity, rather high coloured; the light, warm poultices still over wound; discontinue the ice as applied over abdomen; all treatment still cold; opium in grain doses to be continued every fourth hour. To-day, for the first time, there appeared a slight purplish discolouration over the lower part of the right side of the chest, just above the liver towards its thick end; no tenderness on pressure or pain on deep respiration; no hardness or tension throughout the entire of this inferior thoracic region, but slight dulness on percussion; respiratory murmur I might say natural. Visited at 4 p.m. and 11 p.m.; no change.

Nov. 11th.—Had rather a restless night; complained of pain around the wound on the effort being made to fill the chest with air. The discolouration posteriorly as alluded to on yesterday, and present for the first time, greatly diminished; ordered twelve leeches to be applied around the wound along the track of the pain, which ran somewhat in the course of the costal attachments of the diaphragm on the right side. After bleeding freely, warm stupes to be put on for some time; a linseed meal poultice over leech bites, wound, and all the painful parts; a grain of powdered opium to be given every second hour; diet as before, limiting the brandy to two ounces, barely sufficient to stimulate the heart. 4 p.m.—Pain relieved, the leeches having bled very freely, but not entirely gone; stupes and poultice to be continued. 9 p.m.—Pain entirely gone, even on deep inspiration; poultice to be continued, and layers of fresh wadding and oiled silk over all; bowels quiet, all hemorrhage having been checked for the last two days; to continue the opium every second hour. Though such large quantities of opium have

been taken, the pupils are not contracted, nor has the man been in the least narcotized.

Nov. 12th.—Little change since yesterday, except that the discolouration of the side has all been dispersed. Pulse still very weak, 112, and all the augmented action of the circulation has long since been subdued. Bowels moved; no blood, but the evacuations very dark coloured; urine in fair quantity; no alteration in the wound; to continue local and constitutional treatment as ordered on yesterday morning. 4 p.m.—Again pain of a very acute character; embarrassing respiration, and fixed about from three to four inches behind the wound, and on the right side. At once ordered twelve leeches, stupes and poultice; the grain of opium every second hour; hot jars to the feet; pulse still rapid, yet small and feeble. 9 p.m.—Pain, though subdued, yet still very embarrassing; applied over the right lower thoracic region, and the upper part of the right hypochondriac, a large blister, with a hole cut in its centre, corresponding to the position of the leech bites recently inflicted. Over the entire surface, &c., hot stupes, and to be replaced by a thin linseed meal poultice for the night; opium steadily.

Nov. 13th, 9 a.m.—Pain checked altogether, and the man had a fair quantity of sleep; detected now for the first time some little fulness between the eighth and ninth ribs on right side, and posteriorly behind their great curves moderate tension of the corresponding intercostal muscles, and to very delicate touch some slight deep œdema. This region was likewise more dull on percussion, and now vesicular respiration in the lung on the right side was heard very feebly and very deep within. This important change, as I discovered, was borne testimony to by the most careful examination of our distinguished physician of the hospital, Dr. Moore. Now my watchfulness for several days was directed towards this locality as the most probable lurking place of the bullet. The pain referred in this direction, though not exactly to the spot, on more than two occasions; the discolouration which appeared, and so rapidly again passed away; the injury inflicted on the man's clothes where torn by the bullet and the crushing of the button, even in a particular direction, all, it must be admitted, very separate links, yet when connected, leading towards a particular inference, that taken by me, as to this being the site in which the ball would be found. Treatment as on yesterday. 4 p.m.—Pain relieved entirely; bowels quiet. Carefully I examined again for the ball. Kneeling beside the patient's bed, I passed my left hand very gently over

the suspected part of the chest, and then with the index finger of my right hand carried gently from before backwards along the eighth and ninth intercostal spaces, and corresponding to that part already marked out by auscultation and percussion, as somewhat dull, by the lightest palpation with the finger, between the eighth and ninth ribs, just behind their great curve, I thought I could discover within the chest a solid body; twice I got the slight shock to my finger, so as to make me certain that a foreign body was within, small, weighty, and movable. After these very gentle efforts the foreign body eluded me altogether, and the best directed touch could not discover its presence. 9 p.m.—Free from pain; pulse 115; patient a little flushed; wound suppurating healthily; all sloughed part cast off; chest and abdomen covered with stupes and French wadding, and oiled silk as before; opium continued; all nutriment now given tepid and even warm.

14th November.—Still flushed; pulse, 112; bowels freed; no return of blood; wound healthy; no pain in its vicinity; again examined carefully the affected side; no discolouration or increased œdema; no extension of dulness or want of respiratory murmur—as by an application of the same delicate tact as pursued on last evening, I again discovered the same weighty tap from within, on gentle palpation over the suspected spot. This sensation was likewise appreciated by my able colleagues, Doctors Moore and Ledwich, yet quietly again the ball hid itself and could be no more felt. I rolled the patient the least degree from off of his back over towards the sound side, not more than three inches, when the foreign body eluded all further detection; neither was it to be discovered on the patient being brought back again to his former position. To continue opium; stimulants; nutriment 4 p.m.—I could not discover the foreign body, in the most careful and gentle examination. 9 p.m.—Having again made search for the foreign body, I discovered it as distinctly as on the second time; no doubt within the chest, and with some range of motion permitted to it—most likely chambered off from the general pleural cavity.

November 15th.—The man had a restless night; pulse 116; skin hot; face flushed; and refused his food. I again examined carefully the chest, but could obtain no information as to the presence of the foreign body as satisfactory as before; continue treatment. 4 p.m.—At this visit I again felt the weighty little body, by the same gentle palpation, very deep, and with the gentlest touch I

could satisfy myself of its form. I pronounced it, without doubt, to be the bullet. The man made a slight change in his position, and again it was gone, and hid itself, so that it could not be found out; however, I was satisfied that the bullet was there, and determined if I again got the same evidence, though involving so weighty a question, at once to cut down upon it and accomplish its extraction. However, this opportunity was not permitted to me, either at this time or when I again visited my patient, at 9 p.m.; and I may state, at this last hour I could not satisfy myself even of its being there.

November 16th.—On this day, the sixteenth after the accident, I extracted the ball from Kelly's chest, at twelve o'clock. For the past three days I was cognizant of some solid material floating about, easily disturbed from its position, and situated far back on the right side of the chest, corresponding to the region behind the greatest curve of the ribs, and between the eighth and ninth ribs; on palpation, it was to me evident; there was some little fulness in front of this, corresponding to the blood discoloured mark before alluded to, as being present on the right side; I determined now to cut down on this point, where I supposed the bullet lay, and returned to the ward to do so at half-past 9 a.m. The patient could not be stirred from the bed without a fatal risk; we therefore drew down the bed from the wall and turned it, with the affected side of the patient towards the window. The patient was then gently turned for nearly half a turn towards his left side; but it was now difficult to be certain of the presence of the ball; therefore, for the time, further proceeding was abandoned. I was compelled to desist, from the sinking state of the man, from terror in his enfeebled state at the prospect of an operation; a full dose of brandy was given to him in hot water, and the patient was allowed to remain in his bed, placed in the same position, opposite the window, as I intended to return after a little while when his fright passed away, and his pulse got up. At 12 o'clock I again met my colleagues, as I was not satisfied in allowing the ball to remain lodged any longer; I gently now turned the patient over less than half a turn, and had him sustained so by assistants; having now distinctly felt the ball, I cut down upon it, in a line corresponding to the course of the ribs, and midway between the eighth and ninth, somewhat nearer to the upper edge of the eighth, the incision was about three inches and a-half deep through the integuments and external layers of intercostal muscles; in the second

cut, deeper through the internal layer, and adventitious material, fully a table spoonful of purulent matter escaped, and some coagulated blood with it; I then pressed steadily upon the part, and the bullet presented its convex end and was readily drawn out; but little matter followed its extraction; I put my finger into the wound and gently searched around; a very considerable cavity, quite smooth on the surface next the lung, but somewhat uneven externally or towards the ribs; the full length of the index finger could range this cavity; I am certain it did not communicate with the right pleural cavity, or it may have been a part of it walled off by adhesions to the visceral layer; this I believe was what really took place, or in other words, the pathological change assisting the ball in its escape from detection during several examinations, yet always retaining it within certain bounds, so that it could again be found. I have mentioned having searched carefully this cavity, my chief object being to ascertain if any foreign bodies, a piece of cloth, the missing top of the button, or some other portion of the man's dress, had been carried in before the bullet in its rapid course; such happily was not the case; there was no bleeding from the wound; I placed a few shreds of lint steeped in oil within the track of the wound, so as to allow any fluid secreted within readily and at once to escape; a small lint compress was placed on either side of the wound, and the parts supported with a few wide straps of adhesive plaster, so as to prevent undue motion of the ribs and wounded parts; the man was much elated on the extraction of the ball; yet, to prevent syncope, brandy had to be freely given. The ball was somewhat flattened in its cone where it struck the button, it also had stamped on it the first two letters of the word police, which was on the button, and also some of the internal copper layer of the button impacted brightly on its surface; in a deep groove on one side of the ball lay compressed tightly a small piece of the cloth of the man's coat. The ball was similar in size, weight, and form to that which I extracted from the body of Constable Kenna, shot

by the same man, and with the same pistol. (By looking at the woodcut, its size and form may be observed—most accurately and

beautifully represented by Mr. Oldham.) 3 p.m.—He has been doing well since the operation, and is now in a tranquil sleep.

Nov. 17th, 9 a.m.—Slept well, in fact continuously; pulse 120; bowels moved once; motions still dark, but more solid; no pain in the wound, which I made on yesterday, no tenderness about it; the man still lies quietly on his back; did not disturb the dressings; the wound of entrance suppurating and granulating healthy; some intercostal pain towards the left side, a little above the heart; chest clear on percussion throughout; feet a little œdematous, owing, I think, to the drooping position in which the limbs lay; ordered stupes wrung out of boiling water, sprinkled with laudanum, over the abdomen and over entire walls of the chest, and a mustard poultice over the pained part above the heart; omit opium now in the day, one full grain of the powder at bed-time; ordered two grains of quinine and ten drops of aromatic sulphuric acid in a little water, every fourth hour; an egg beaten up with brandy and milk, and an ounce of brandy every second hour; beef-tea and chicken-broth. Drew the man up in the bed more, and supported him so with pillows, so as to prevent congestion of the lungs; the legs were slightly elevated too, so as to lessen œdema. Visited at 3 p.m., 8 p.m., and 12 p.m.; not necessary at any of these periods to alter treatment.

Nov. 18th.—Slept quietly; pulse down to 105, soft and feeble as might be expected. The falling of the pulse, fifteen beats in twenty-four hours, was very good, showing, in a decided manner the relief from irritation, the foreign body, the bullet being removed; bowels opened twice, too freely, so ordered a chalk-draught with kino, extract of catechu and opium; beef-tea stopped; arrow-root and port wine every third hour; and eggs beaten up with brandy and milk as nutriment. Changed the patient into a fresh bed, and placed with the trunk somewhat elevated to guard against congestion and traumatic pneumonia. 3 p.m.—Bowels moved again since early visit; repeated the astringent draught; ordered port wine mulled with spice, and port wine and arrow-root. 8 p.m.—quiet. 11 p.m.—Bowels quiet; pulse at same range as in the morning; to continue.

Nov. 19th.—This day there is a marked improvement in every way; pain in chest gone; gone on deep inspiration, except at a small point in the vicinity of the anterior wound; pulse down to 90, that is twenty-five beats in the minute, in 48 hours, since the operation; his countenance is brighter and not congested; and his breathing is

altogether easier; bowels quiet since last evening. The wound which I inflicted for the extraction of the ball, though just four inches long, is healed, very nearly by first intention, very little imperfect pus escaping. There is no pain over the region on pressure, and though dull on percussion, yet respiration is quite audible at some depth from the surface; readjusted pads and adhesive straps as before; the anterior wound that was inflicted by the bullet, is contracting, granulating freely and healthily, and, as a consequence, healthy pus secreted from it, but in very moderate quantity, never welling over; œdema of feet all gone, owing, I think, to the changed position of the man; wine in full quantity; beef-tea and chicken-broth, and a little bread crumbled in it, now for the first time since the accident; brandy and eggs. The patient is now well propped up, kept nearly in the sitting position, so as to guard from hypostatic congestion. 3 o'clock.—Has had some very refreshing sleep, and feels stronger and more cheerful. 11 o'clock.—Has taken all his food, steadily, and is now to have his grain of opium in pill.

Nov. 20th.—Slept well; pulse 90, soft; bowels moved twice, so discontinued the beef-tea, &c., and ordered rice boiled, well broken, and rice milk; arrow-root with port wine; an ounce of brandy every second hour, and each alternating quantity with a beaten up egg; slight pain complained of a little to the right of the bullet wound; the lips of the one made for the extraction of the ball glued together, so broke up the adhesion with a probe, and allowed some matter and a little blood to escape, assisted by gentle pressure; applied a soft linseed meal poultice over the entire right side, and opiate stupes over the left and abdomen; bullet wound healthy. 3 p.m., Much improved since morning; congestion, from position, considerably diminished; some uneasiness in right side of chest, but pain relieved on deep inspiration; bowels quiet since morning. 8 o'clock, and 11 p.m.—No pain; to continue treatment.

Nov. 21st.—Slept well; bowels moved once, and for the first time of a proper natural feculent colour, giving evidence that the liver is performing its functions again; œdema of limbs nearly gone; tongue moist; pulse 90, soft; slight pain on deep inspiration, between the bullet wound and the one made for its extraction, the former looks healthy, rapidly filling up and sufficiently moistened with healthy pus; the inflicted wound for extraction, discharging a little laudable matter. Expectoration of matter from bronchial membrane much less, and the congestion of the lungs considerably diminished, and even remarkably so in the right lung. Again enveloped the entire

right side with a linseed meal poultice, a little oiled lint being placed within the lips of the wound; the anterior one dressed as before, with simple ointment; the opium stupes over the entire belly; diet as on yesterday; rice, rice-milk; arrow-root and port wine; brandy and eggs freely; one grain of opium at night; kept well drawn up and sustained so in the bed. 3 p.m.—Feels very comfortable; no pain. Visited at 8 and 11 p.m. To continue every thing.

Nov. 22nd.—Had a good night, slept uninterruptedly; no pain on inspiration, even when forced or made deep; tongue clean; bowels moved once, healthily; pulse 90, soft; œdema of feet gone; wounds suppurating; reapplied the poultice over the entire side; expectoration much diminished, and, in character, more clear and mucous than the discoloured pneumonic characters that prevailed up to this time; rice and rice-milk; brandy and eggs as before; one grain of opium at night. Visited at 3 p.m., 8 p.m., and 11 p.m. Still steadily mending.

Nov. 23rd.—Slept a shade better in every respect; voice scarcely audible, still so weak; bowels once, and solidly moved, and of natural colour; to continue brandy in same quantity; one grain opium at bed-time.

Nov. 24th.—Improving steadily; sleeps; eats, &c.; stopped some of his brandy on yesterday and to-day; he is now taking eight ounces and six ounces of wine.

30th Nov.—Has continued improving up to this morning since last report; wound in side healed, and no tenderness in the line of incision or around it; but the dulness still continues for an area of at least two inches in its circumference; the bullet wound is filled up, nearly cicatrized; but this morning the patient referred pain of a sharp character on deep inspiration or on coughing, to a point about two inches below, and one to the right of the wound. I at once had applied eight leeches with relief, blood being taken afterwards by warm stupes, and the part then covered with a linseed meal poultice. Towards evening the pain had abated, but not altogether gone; the stupes repeated, and a poultice to cover the part for the night.

Dec. 1st.—Slept quietly; pain gone from the position complained of on yesterday, but now referred to a point about two inches (accurately an inch and three-quarters) below that where it centered on yesterday; ordered six leeches over the part, the stupes as before followed by the linseed meal poultice; bowels opened healthily;

pulse quiet. 9 p.m.—Pain somewhat relieved; ordered two grains of opium; poultice and stupes to be continued.

Dec. 2nd.—Slept well; can now draw in a full breath without suffering any pain; both wounds healed up; to continue poultices and stupes, and two grains of opium at night.

Dec. 8th.—All annoyances gone; all wounds healed.

Dec. 10th.—Allowed to sit up; dressed.

Dec. 12th.—Quite convalescent; walks a little about the ward, assisted by a comrade.

Dec. 16th.—Can now walk about without any assistance, and regaining health and strength rapidly; and the poor fellow was dismissed cured on Monday, the 23rd of December, to Christmas at his own home. I have frequently seen Kelly since he left the hospital, and he seems now getting strong and lusty, and in excellent spirits. The woodcuts on the frontispiece adorning these pages, and executed by Mr. Oldham, from beautiful photographs by Robinson, taken a few days since, give two views of the patient; the one exhibiting the cicatrized wound in front, the point of entrance of the ball; the other, the site of the cicatrized wound, the lineal incision made by me for its extraction.

In the surgical report just closed I have dwelt briefly on every practical question, and therefore, in conclusion, I shall only make the few following observations. From a review of every circumstance in connexion with these cases I think it will be admitted that two more formidable examples of gunshot wounds could not have fallen under the observation of the surgeon. Now, from a close analyzing of the symptoms of the injuries inflicted in each, of the momentous consequences resulting from the operative procedure called for, no want of vigilance, or deviation of surgery from a healthy standard, could be permitted. The same laws should ever regulate the military practitioners as the civil surgeon—the wise and considerate appreciation of facts, the judicious interference of operative art. Every civil hospital surgeon understands the regulating laws of projectiles, and to what extent they may assist him in arriving at correct views in any given case, and the sharp quickened intellect of the civil hospital surgeon, can, as rapidly as any other, detect the slightest deviations or changes requiring a departure from ordinary rules. Any of the complications likely to arise, or that may ensue after gunshot injury, are those well known and quickly recognized by the civil surgeon in

his ordinary practice, in cases where violence has been impressed on the living frame; and any operative measures that may be required after gunshot injury, are as sedulously anticipated, and can as effectively be executed by him as those every day occurring, the result of ordinary violence. Every educated surgeon is aware of the relentless violence inflicted upon every tissue of the body, hard and soft, by the rifled barrels, breech-loaders, and conical balls adopted in the instruments of warfare of the present day, and yet the same great practical lessons laid down by Hunter, by Guthrie, by Hennen, by Thompson, will remain for ever as storehouses of knowledge, from which all moderns may draw abundantly. As for Hunter's writings they stand the very impersonation of truth. Hunter's great work on the blood, inflammation, and gunshot wounds, published in 1794, will for ever stand as a monument of his ability, his originality, and his profound thought. Time and inquiry only bring out the beauty of his conceptions, the unyielding accuracy of his opinion; and in all his writings so genius has marked him, while some of his aphorisms remain still beyond our grasp—like the bow of Ulysses, that none but its master could bend.

ART. X.—*Contributions to Operative Surgery.* By HENRY GRAY CROLY, Fellow and Licentiate of the Royal College of Surgeons in Ireland; Licentiate of the King and Queen's College of Physicians; Surgeon to the City of Dublin Hospital; Lecturer on Clinical Surgery; Senior Demonstrator of Anatomy in the School of Surgery of the Royal College of Surgeons; &c., &c.

- I. EXCISION OF THE ENTIRE LEFT SUPERIOR MAXILLA, BY A SINGLE INCISION, FOR MYELOID TUMOUR.
- II. EXCISION OF HALF OF INFERIOR MAXILLA, FROM THE ARTICULATION, FOR EPULIS.
- III. REMOVAL OF A LARGE PORTION OF THE LOWER JAW FOR NECROSIS.

OPERATIONS for the removal of the upper and lower jaw must be considered very remarkable achievements of modern surgery.

The diseases requiring such bold procedure cause much deformity and personal discomfort to the patient, and, by implicating vital