

Charles Bell as an illustrator of military trauma (1809 and 1815)

Nikolay N. Krylov¹, Yana G. Grigoryan¹, Aftandil V. Alekberzade¹

¹ *FSAEI HE I.M. Sechenov First MSMU MOH Russia (Sechenov University)
8 Trubetskaya St., building 2, Moscow 119991, Russia*

Corresponding author: Nikolay N. Krylov (nnkrylov01@yandex.ru)

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Abstract

The article analyses paintings of wounded patients created by Scottish anatomist, neurologist, practicing surgeon and artist Charles Bell – graphic sketches in travel sketchbooks, paintings (1809) and watercolours (1815). His works provide a representation of the structure of wounds suffered during battle. The article compares 15 paintings from “The Wounded following the Battle of Corunna” series, (on display in the hall of the Royal College of Surgeons of Edinburgh) and 17 watercolours from the collection of The Wellcome Library from the [Royal] Army Medical Services Museum. The authors stress that both the sketches and the paintings derived from sketches from Bell’s early work were rudimentary and unsophisticated compared to later watercolours of the wounded during the Battle of Waterloo. Most of the paintings from 1815 are dated and accompanied by comments, detailing not only the circumstances and nature of the wounds, but the name (or surname) of the patient, place of treatment, arm of service, regiment number, as well as a brief excerpt of the medical record, as well as the fate of many of the patients who had undergone surgical treatment. These works provide an insight into not only Bell’s work as a surgeon, but how his artistic style developed as well. The visual artefacts and details on the paintings are laconic, yet expressive. The eyes of the wounded soldiers convey an indescribable mixture of the joy of surviving battle, the fear of the irretrievability of physical loss incurred, incessant pain of the wound, its chilling inevitability and submission before its power, moral exhaustion, the after-effects of hypovolemic shock, agony from the impending or completed treatment, anxiety and fear of death. Familiarisation with Bell’s paintings when training students of general surgery and the history of medicine acquires didactic significance, while the raising of awareness and provision of accessibility for the general public play a crucial role in understanding the true realities of war and sympathy for its victims.

Keywords

history of medicine, military trauma, military surgery, gunshot wound, Charles Bell, images of the wounded, sketches of wounds

Wars in which from 1799 to 1814 most European countries, as well as some African and Asian states, participated could be called “World War Zero”, since these events involved more than 60 million people. Casualties (those killed, those who died of various causes, the sick and wounded, prisoners of war and deserters) of the Napoleonic Wars amounted to 3.457 million people, and with military personnel and civilians combined, the figure stands at no less than 5 million people (Kaminskiy and Novoselskiy 1947, Fremont-Barnes 2006, Voennye poteri... 2017).

This page in the history of humanity is analysed in great detail in many documents, literary and art

works, as well as paintings. The rare combination of artistic, scientific and literary abilities of the Scottish anatomist, neurologist, practicing surgeon and artist, Charles Bell (1774–1842), gave his work special significance as evidence of the realities of this war. In Russia, his name is associated with the Bell–Magendie law and the name of a disease (Bell’s palsy), but nothing is virtually known about him as an artist.

Bell is said to have inherited his talent as an artist from his mother. Growing up, he learnt drawing and painting from well-known painter David Allen (Grzybowski and Kaufman 2007).

People in the 21st century lived through the horrors of two world wars and numerous regional military conflicts. Mass media, a variety of exhibitions of the casualties of war by way of artistic tools numbed the perception of the modern man and deprived of empathy those who witnessed the suffering of their close ones. Detachment helps to be unprejudiced, but it easily transforms into indifference. By immersing us in the atmosphere of the era of the wars of the early 19th century, Bell's paintings give us back the ability to empathise and sympathise due to their vividness (Howard 2005). For Bell, paintings apparently had an applicable nature: they enabled him to make a precise, detailed illustration of what visual imagery required apart from a worded description.

In his early work from 1798 on anatomy, titled "A system of dissections, explaining the anatomy of the human body, the manner of displaying the parts and their varieties in disease" (reprinted in 1810), Bell gave an elaborate illustration of the anatomic structures of various parts and organs of the human body (Bell 1810). In 1806, he published his original book titled "Essays on the anatomy of expression in painting", in which he made a few dozen drawings conveying various human emotions (Bell 1806). The range of Bell's abilities as an illustrator is stunning: for him, it seems there are no technical limits. Graphics and memorable images of physical pain (torment, suffering), agony, wailing, discontent, rage, despair, contrition, fear, horror, astonishment, joy and laughter – are etched in memory. The grand purpose of this monograph is an attempt at tracing the causes of the manifestation of distinctive physiognomic characteristics and movements of the body under the influence of passion and emotion. The illustration of a madman ("Madness", illustration on page 153) is well-known and often reproduced. Bell portrayed the expression of vacancy and aggression on the face of the madman as a result of emotional stress (Bell 1806). His growing interest in surgery came to the fore in his first illustration of a specific physical injury – a knife wound to the neck (illustration on page 119). He explains the reaction and involvement of specific muscles of the face and the upper half of the torso of the victim with the peculiarities of his character and distinct manifestation of emotion. However, it appears this illustration was not made from life, like that of the madman, which was made after a visit to Bethlem Hospital in July 1805.

A major battle took place on 16 January 1809 near Corunna, on the Iberian Peninsula in Spain, between British and French armies, in which the French prevailed. The remnants of Sir John Moore's army (about 28000, including the wounded and the sick) were forced to urgently evacuate from the continent. The journey home lasted four days. Upon reaching the shores, it became clear that about 6000 people (more than 20% of all servicemen) were in need of medical attention. To the alarm of the locals (Sir Charles Bell's watercolours,

Howard 1991), more than 5000 soldiers and officers were delivered to Portsmouth and Plymouth alone. The British military department could not cope with the large numbers of the sick and wounded on its own. Civilian (Crumplin and Starling 2005) doctors arrived in Portsmouth to attend to the soldiers. One of them was Sir Charles Bell.

Most of the hospitalised servicemen were suffering from various infectious diseases. In Plymouth, of the 241 fatal cases, only 25 were from wounds (most of the cases were from typhoid and dysentery), and in Portsmouth, of the 116 medical staff, 21 suffered severe bouts of fever and six died (Howard 1991).

Besides the primary work of a surgeon – amputating and splinting limbs, searching and dressing wounds, Bell drew sketches. Unlike his work of 1815, all of the sketches are anonymous (they do not have the names of the depicted servicemen), and are only accompanied by brief notes describing the wounds. And, probably, most importantly: the drawings depict either only the injured parts of the body (without the face of the patient), or if the head and face are visible, the eyes of the patient are downcast or drawn sideways. Another key feature of this part of Bell's legacy, normally referred to as "The Wounded following the Battle of Corunna", is that of the 15 sketches, 14 depict gunshot wounds sustained from musket balls.

And that is no coincidence. Musket ball wounds were the most common in the era of Napoleonic Wars (they accounted for up to 75–80% of all types of wounds). The most famous surgeon of that time – Dominique Larrey (Larrey 1829–1836, Larrey 1812–1817) – wrote about this in his memoirs. Muskets fired lead balls and could cause dreadful wounds at close quarters (up to 80–90 m): the ball could easily become flattened upon impact, breaking bone, opening up large holes in muscles, causing massive external and internal bleeding and shock (Infantry Tactics...). Bell expressed special professional interest in this type of wounds, which was later reflected in his monograph and dissertation. Black and white sketches first appeared in his travel sketchbook. He later returned to these sketches and made full-scale oil paintings (canvas size – from 33 to 90 cm).

One of these 15 paintings illustrates a wound to the abdomen. Entry and exit holes can be seen in the mesogastrium. This is most likely a non-penetrating wound since the patient is sitting without strain and is pressing the pubic region with his right hand, which would be impossible with peritonitis as a result of damage to internal organs. Furthermore, penetrating wounds to the chest and abdomen, accompanied by internal bleeding, were fatal and were not safe for surgical intervention at that time (Adams 1983).

Three paintings depict chest wounds. In one case, the entry hole is located in the first intercostal space on the right-hand edge of the sternum (the so-called cardiac zone of present-day thoracic surgery). A penetrating

wound to this area is associated with damage to major vessels and/or the heart. The skin of the patient is coloured blue-white (thanatogenesis is a result of progressive blood loss); the face is covered with a cloth – the patient has died. This is the only painting of a deceased patient. The second painting illustrates a non-penetrating wound with an entry hole on the lower edge of the right-side pectoralis major, which blindly ends in the right-side underarm area. The patient is standing before the surgeon, with the right hand thrown back over the head. The wound is apparently relatively fresh: wound complications are not yet visible. The third case depicts a patient in a critical condition, reclining on the head of the bed. On the right-side half of the chest is a fresh wound following the opening of an intermuscular abscess, from which pus and blood flow.¹

In the dissertation, which is written from fresh experiences (Bell 1814) (on the illustration in Appendix 6)², the same soldier is apparently illustrated before the opening of the abscess and removal of the musket ball, which entered through the right scapula, broke a rib and became stuck in the chest muscles after ricocheting.

The two paintings illustrate gunshot wounds to the lower limb: one of the paintings illustrates a wound to the middle third of the right thigh, and the second – to the ankle with the shattering of the ankle joint. The viewer's attention is focused on the details of the wound: the state of the soft tissue of the wound canal and its surroundings in the region of the entry hole is elaborately drawn. In both cases, there are clear signs of the beginning of complication – wound abscess.

Hand wounds are illustrated on four paintings. Two illustrate a diaphyseal gunshot fracture, and the third illustrates a wound to the upper third of the arm (epiphyseal fracture) with the shattering of the humeral head. In the fourth painting, the elbow joint is completely shattered, and signs of arm and forearm phlegmon are clear. All of the wounded hands lie on a support in a forced position.

One watercolour depicts the lower body of a patient with a wound to the scrotum with damage to both testicles. The scrotum is swollen and reddened. Necrotic tissue spills out through the external hole of the wound. Oedema spreads to the base of the scrotum. In this case, the coupling and further spreading of anaerobic infection to the groin and external sex organs may suggest the beginning of Fournier gangrene.

The characteristics of gunshot wounds to the head are illustrated on three paintings. In two cases, the heads are shaven, but surgical intervention in relation to the wounds on the frontal and parietotemporal regions is yet to be performed. Entry gunshot wounds

and deformation of the head at the site where the ball is located under the scalp are exposed. The third case shows traces of a cross-shaped incision of soft tissue in order to expose the wound in the parietal region, a circular skull defect after the opening of a burr hole and extraction of a musket ball, blood coagulum and bone fragments.

The last painting of this series shows a naked soldier, whose gunshot wound has been complicated by the development of tetanus. Bell depicted the signs of this disease in detail: lockjaw (masticatory spasm) with the manifestation of a sardonic grin (wrinkled forehead, stretched lips with lowered corners of the mouth) due to the hypertonia of facial muscles and opisthotonos (due to the hypertension of skeletal muscles, the patient arches and is supported only at the back of the head and the heels).

The paintings of the wounded following the Battle of Corunna are displayed in the hall of the Royal College of Surgeons of Edinburgh.

Five years later, in 1814, after accumulating vast personal experience on treating patients with gunshot wounds, Charles Bell published the Dissertation on Gunshot Wounds (Bell 1814), in which he used his sketches as illustrations. He describes the characteristics of gunshot wounds from musket balls. Bell identifies two affected areas of the tissue around the wound canal, caused by the effect of the impact wave of the projectile. He pays considerable attention to the diagnostic study of the wound and tools for extracting the projectile, as well as complications – fractures, hard-to-heal purulent fistula (osteomyelitis!), wounds to major muscles, vessels, general principles of treatment, and details the instructions for the amputation of limbs.

The third page of the dissertation shows a black and white drawing of a wound to the head from a musket ball and oedema of brain matter, “mushrooming” out of the wound. The characteristics of the drawing fully match those depicting wounds in Corunna, which enables to associate it with that period. However, it was never turned into a full painting, unlike the others, which are shown in the appendix to the main body of the dissertation.

Appendix 1 features a drawing with two, as Bell describes them, wounds of different soldiers – to the abdominal wall and the scrotum. Appendices 2, 3 and 4 feature sketches of bone specimens, with multi-fragmentary fractures of vertebrae, femoral, tibial and humerus bones, and multiple sequestra. It also features a sketch of a bone specimen with fractures of the clavicle, first rib and scapula (Appendix 4, Fig. 3), which explains the cause of death of the patient portrayed in Appendix 13: he survived external pulmonary haemorrhage in the early days after sustaining the wound, but after the accumulation of pleural exudate and the thoracocentesis performed by Bell, the patient died 12 days after sustaining the wound. In contrast, the patient in

¹ Ref.: <http://www.the-athenaeum.org/art/list.php?m=o&s=du&oid=3150&f=a&fa=7884>.

² Ref.: <https://archive.org/details/dissertationongu00bell/page/n75>.

Appendix 5 with a penetrating wound to the thoracic organs had haemoptysis with discharge of albuminoid sputum for several days, but his condition later stabilised.

The drawing in Appendix 6 shows a soldier who, as described by the artist, was distraught by the fact that he had been wounded in the back. On the front chest wall, there is an abscess caused by an infected haematoma and a foreign body (musket ball). Facial features, characteristics of the development of the wound and, most importantly, Bell's personal involvement in his fate (opening of the abscess, removal of the musket ball) suggest that the author followed up on this patient after successful surgical intervention, which he repeatedly captured on the painting.³

Appendix 7 features a drawing of a wound to the shoulder girdle. The wound shattered the humeral head (its specimen was illustrated in Appendix 4 (Fig. 1, Fig. 2)). Appendix 8 shows a drawing illustrating the aftermath of saving a hand after a multi-fragmentary gunshot fracture of the left humerus, with the formation of two fistulas through which, as described by Bell, bone sequestra passed. Appendix 9 shows an observation, similar to the previous one, which Bell considers the subsequent (unsuccessful) course of the wound process as a result of saving the limb (amputation was not carried out on time): a vivid picture of chronic osteitis of the right humerus with the formation of multiple purulent fistulas and a giant chronic ulcer with overgrowth ("mushroom-like") of granulations is depicted. Appendix 10 (Fig. 1) shows an illustration of the left thigh with a splintered gunshot fracture; the illustration of the bone (Appendix 2, Fig. 1) after the amputation of the thigh supports the author's argument on the need for early amputation in such cases; Fig. 2 illustrates purulent gonitis, which required arthrotomy and removal of the musket ball.

Appendix 11 shows an unsuccessful attempt at extracting a musket ball from the shin with special forceps. The ball could not be found among the bone fragments; the wound was complicated by a large phlegmon, and amputation had to be carried out to save the life of the patient. The drawing of bone fragments (post-surgery specimen – Appendix 2, Fig. 2) gives an idea of the course of the wound process.

Appendix 12 shows two drawings: a wound to the left forearm with the complete shattering of the head of the ulna, which required amputation with subsequent recovery of the patient; and the left hand with

two entry holes in the distal part of the forearm and the lower third of the arm, one exit hole in the upper third of the forearm and a wound to the upper third of the arm for removal of the musket ball. In the second case, the soldier apparently stretched his hand forward as he instinctively tried to protect himself from the gunshot, and the musket ball travelled along such a freakish trajectory. Bell thought it was necessary to share such an observation.

Three comments can be made from his dissertation. First of all, the appendices (13 in total) are given in a haphazard manner. In different parts of the dissertation, the author refers to the same patients, presenting new aspects (and, therefore, illustrations) of observations described earlier. Secondly, from the five black and white sketches that are included in the dissertation, Bell makes six large paintings: the wound to the abdominal wall, scrotum, the opening of the abscess of the chest wall, chronic osteitis of the left arm with multiple purulent fistula, the death of a patient with a penetrating wound to the chest and opisthotonos in a wounded patient.⁴ Along with the sketches, the text of the dissertation is included in the author's monograph on operative surgery as Chapter 7 (Bell 1814). The sketches, like the paintings derived from them, were laconic and unsophisticated compared to the later watercolours of the wounded following the Battle of Waterloo. In an effort to reveal trends in the course of gunshot wounds and systematise ideas about war injuries, Bell coincidentally captured rare observations, trying to convey both rarity and routine.

In 1813–1814, Charles Bell was appointed member of the Royal College of Surgeons of England and consultant surgeon at Middlesex Hospital. However, the Napoleonic wars were still raging. At the end of the period known as the Hundred Days, Napoleon attempted to wrestle back power in France. The decisive battle between Napoleon's army and the Anglo-Prussian forces (the Seventh Coalition of European Monarchies) near the village of Waterloo (a settlement in Belgium, 20 km south of Brussels) took place on 18 June 1815. During this battle about 55 000 people from both sides were either killed, wounded or went missing. According to M. Crumplin, in just four days of the main battle, medics had to attend to at least 63 000 casualties (Crumplin 2013).

On Napoleon's side, about 24000 – 26000 people were either killed or wounded. Furthermore, 6000–7000 soldiers were captured and 15000 deserted (Treating the wounded...). According to more accurate data from C. Oman, total losses incurred by the French army at Waterloo amounted to 37000 of 72000 soldiers (nearly 50%) (Oman 1904). Throughout the campaign, from 15 to 22 June 1815, France lost 55200 (nearly 43% of

³ Wound to the right scapula with formation of abscess on the front chest wall: before the opening of the abscess and removal of the musket ball (<https://archive.org/details/dissertationongu-00bell/page/n75>); after the opening of the abscess and removal of the musket ball (<http://www.the-athenaeum.org/art/detail.php?ID=168210>). The Wounded following the Battle of Corunna: Gunshot Wound of Scapula.

⁴ Tetanus. The Wounded following the Battle of Corunna: Tetanus Following Gunshot Wounds (<http://www.the-athenaeum.org/art/detail.php?ID=168221>).

the 126000 servicemen). Napoleon ran out of artillery, dumped his remnant army and fled to Paris. The Duke of Wellington remarked: “A damned nice thing – the nearest run thing you ever saw in your life”.⁵ However, the fierce battles also proved costly for the allied forces: about 22000 soldiers (Crumplin 2013) were either killed or wounded. However, English historian H.A.L. Howell (Howell 1924) offers different estimates: the Allies lost about 13000, and the Prussian army lost about 7000 (of the 106000 and 117000 soldiers involved in the campaign, respectively), which all together accounts for about 9%.

The news of the victory only reached London on the fourth day. Upon learning of the grand battle, Charles Bell urged his brother-in-law John Shaw to immediately go and help the wounded: “*Johnnie! How can we let this pass? Here is such an occasion of seeing gun-shot wounds come to our very door. Let us go!*” (de Saulles and Wakely 2010).

Leaving for Belgium on 26 June 1815, Bell took with him surgical instruments and a travel sketchbook where he could document interesting observations. He left for the continent as a voluntary consultant and was in Brussels from 29 June to 9 July 1815. In his letter to his wife, dated 1 July, he gives a vivid description of his first impressions of his work in Brussels: “It was thought we were prepared for a great battle, yet, there we are, eleven days’ after it, only making arrangements for the reception of the wounded”. The lack of adequate help could be due to the fact that the Duke of Wellington gave the order to organise medical assistance for the wounded with the opening of hospitals in Brussels and Antwerp only on 20 June 1815. Of the five main facilities in Antwerp, four were meant for the allied soldiers and only one for the French. The situation was better in Brussels, but there were still many cases of wounds that were unattended to and that were complicated by fever and gangrene. The wounded French were in the worst state, which was exacerbated by the fact that after the battle and the delivery of first aid (more than 500 amputations on the battlefield), most of the military doctors followed the army (Howell 1924) and moved from Brussels to Paris.

An additional 270 surgeons were enlisted to treat the wounded. However, few of them had the necessary experience. This was particularly why they often had to perform “guillotine amputation” or the “sugarloaf stump” type of amputation, which leads to the formation of conical stumps which are hard to heal (Bell 1801, Nurse 2015). While the wounded English were in a bad state, the French faced a worse predicament: after the defeat, many of the wounded from Napoleon’s army were left to die on the battlefield (Nurse

2015, Payne 1971). Recognising that the French were in the worst circumstances, Bell took the trouble to provide them with surgical assistance for humanitarian and altruistic reasons. This suggests that Bell most probably acted as a civilian volunteer rather than a military surgeon.

For several days, Bell operated at the Gendarmerie Hospital from 6 am to 7 pm until “his clothes became stiff from blood coagulum, and his hands became exhausted from the strain of holding the scalpel” (Howell 1924, Pearce 1993). His sketches also include patients at Hôpital des Jesuites, Caserne St Elizabeth), Peltier) and York. When Bell began his work, most of his patients were in a critical condition: they left 11 days after sustaining the injuries. This explains the dismal results of the amputations he performed: out of 12 patients, according to Dr. Robert Knox who assisted Bell during the operations, only one survived (92% case fatality) (Gordon-Taylor and Walls 1958). Such results were extremely unsatisfactory even in an era ignorant of aseptics and antiseptics. It is generally accepted that case fatality in Belgian hospitals was not more than 9%, given that about 2500 primary amputations were conducted on the battlefield, and the critically wounded rarely made it to the front-line or rear hospitals – they died soon after on the battlefield (Crumplin 2013).

Without a clearly articulated medical doctrine during this period, both French (Larrey 1829–1836, Larrey 1812–1817, Larrey 1832) and English (Howell 1924, Guthrie 1815, Guthrie 1862) surgeons followed the same instructions for early amputation in the event of gunshot fractures in extremities in the immediate vicinity of the battlefield, immediately after sustaining the wound, or in the first few days before the development of clinical signs of infection. However, Russian doctors resorted to amputation only with clear signs of non-viability of a hand or leg, and secondary amputation was carried out only if it was impossible to remove the foreign bodies or in the event of an infection (Nagumovich 1822, p. 9, 16). Bell thought his colleagues had unjustifiably broad instructions for amputation in numerous cases, for example, in a patient with gunshot fracture of the humeral head and marked posthemorrhagic anemia, when the patient is extremely weak because of bleeding (Kazi and Rhys-Evans 2004).

As usual, Bell wrote brief notes about his patients and drew sketches with a charcoal pencil and red ink. In 1836, when he was appointed professor of surgery at the University of Edinburgh, these sketches were used to create a series of stunning watercolours which Bell used as illustrations in his lectures. Seventeen watercolour drawings were made from 45 sketches (length of paper sheet – about 2.5 feet, width – 1 foot 10 inches). In 1866, Lady Bell handed over these drawings, along with the sketches, to The Wellcome

⁵ “We were close to defeat like never before in our life”. Ref.: Waterloo. <https://www.history.co.uk/history-of-the-battle-of-waterloo/waterloo>.

Library from the [Royal] Army Medical Services Museum, where they remain to this day (de Saulles and Wakely 2010, Payne 1971). Their digital versions are available to anyone studying the medical aspects of the Battle of Waterloo. Each of the drawings has a simple RAMC code (from 1 to 17), which enables to easily identify each one of them.⁶

Seventeen sheets contain illustrations of 18 patients and their wounds with anatomical precision: eight have wounds to the head or neck, two – to the chest or abdomen, eight – to the limbs. Bell's random sampling is confirmed by statistics: during the Battle of Waterloo, most of the wounds were sustained in the limbs (about 75%), and two-thirds were sustained from smooth-bore, low-power firearms (muskets, carbines, pistols) (Crumplin 2013, Crumplin 2015). Three of Bell's patients sustained wounds from cold steel arms (sabres), nine – from musket balls, one – from grapeshots, and five – from cannon balls. Wounds from cannon balls weighing 3 to 24 pounds were normally fatal if they were sustained in the torso, head or neck. Wounds to the limbs led to traumatic amputation. Wounds sustained from large cannon balls at a tangent (tangential impact) usually led to serious internal injury and concussion. Penetrating gunshot wounds to the chest and abdomen usually ended with death (Crumplin 2013, Tselorungo 1992).

The steady decline in the frequency of wounds from cold steel arms (bayonets and sabres) during the wars in the 18th–20th centuries is noteworthy: in the late 18th century they accounted for up to 17–18% (Infantry Tactics...); in the early 19th century, according to D.J. Larrey, they accounted for 2% (Larrey 1832), among Russian soldiers during the Battle of Waterloo, the figure was no more than 5% (Tselorungo 2006). The English reported rare cases of wounds sustained from pikes, bayonets and sabres at Waterloo, mostly among French cavalry soldiers (Howell 1924). There were no reported wounds from cold steel arms during World War I: artillery projectiles accounted for 68–72% of the cases, while bullets (rifle and machine gun) accounted for 32–28% (Belash 2012, p. 149–150).

Unlike his work from 1809, most of Bell's paintings in 1815 are dated and accompanied by descriptions (the circumstances and nature of the wounds, the name or surname of the wounded, place of treatment, arm of service and regiment number are indicated, a brief description of the case record is given, the fate of the many of the patients weeks and months following surgical treatment is traced). A comparison of this later series of Bell's work with his paintings from 1809 provides a clear insight into how the artist's style developed. His canvases are certainly the opposite of the variety of glamorous, salon paintings of this era (for example, C. Gautherot "Napoléon blessé devant Ratisbonne" or

G. Garitan "Larrey effectuant une amputation de Reb-somen à Hanau, 1813").

The details on Bell's paintings are laconic, yet expressive: a pillow at the head of the bed, packed with straw; a rope on one of the saved hands, with the help of which the patient is able to rise and sit; a quill in the right hand and an open stump of the left arm with bone fragments and pieces of soft tissue. The eyes of the soldier convey an indescribable feeling: a mixture of joy of being alive, fear of the irretrievability of physical loss, incessant pain, moral exhaustion, the after-effects of hypovolemic shock, agony from the impending or expected treatment, anxiety, and fear of death.

Five paintings contain illustrations of six patients with head wounds. The first watercolour (RAMC/95/1/1) features a patient with a sabre wound (a cut to the skull cap). Bell advised to remove bone fragments and leave the skin covering the bone defect. Days after the surgical intervention, the patient regained consciousness, but suffered amnesia. Bell followed up on the patient, as was the case with his other patients, and made sure the wound had healed (Longmore 1866). The other watercolour shows a patient with a wound to the forehead, prepared for operation. After trepanning and removal of the musket ball, the patient was walking in the ward the next day. In another patient, the ball, which had penetrated the skull, was lodged at the back of the left eye, which the bulged eyes seemed to suggest. As a result, Bell had to remove the ball through the left eye socket. He gave a detailed description of the case of patient Wanstell: skull fragments were firmly wedged in the wound; it was impossible to extract them, and so trepanning had to be carried out to remove the bone fragments and blood coagulum.⁷ Despite repeated dressing, the patient developed meningitis, cerebral oedema, and died (Gordon-Taylor and Walls 1958, Longmore 1866).

The next painting shows two patients: one wounded in both eyes (this case caught Bell's attention because the patient lost both eyesight and sense of smell); the second one shows a patient with a unilateral lesion of the eyeball. The next one features a patient with a sabre wound to the neck muscles on the left-hand side and a perforated oesophagus (saliva and food pouring out through the wound). Bell later recalled that the sketch of the grapeshot wound to the right-hand side of the neck in particular caught the attention of Dominique Larrey, whom he showed his drawings. The patient was paralysed in the right hand (injury to the brachial plexus) and had recurrent bleeding from the wound. According to Larrey, such patients usually died of air embolism (Practical essays... 1841). According to Bell, this patient died two days after the sketch of the wound

⁶ Ref.: <https://wellcomelibrary.org/item/b19652355>.

⁷ Patient with a gunshot wound to the head after trepanning, oedematous brain matter pouring out of the wound (Gunshot fracture of skull, Wanstell, Caserne Elizabeth; RAMC/95/1/4).

(Longmore 1866) was made. One patient survived after a tangential cannon shot wound to the chest without damage to the ribs (RAMC/95/1/8). A sabre wound to the abdomen led to multiple damages to the large and small intestines and eventration (on the battlefield). Attempts at tucking in the intestines without sealing the defects of the bowel wall, its decompression and lavage of the abdominal cavity of the patient were unsuccessful (Gordon-Taylor and Walls 1958, Longmore 1866) (RAMC/95/1/9).

Another wound (RAMC/95/1/10) required exarticulation of the right hand because of the damage to the articular surface of the humerus and the acromion process of the scapula. Another painting shows a patient five days after the removal of the humeral head following a gunshot wound sustained in the left arm. Bell thought this operation should have been performed through longitudinal rather than transverse access (as was the case with the patient). Later, the abscess in the chest wall of the patient had to be opened. The twelfth painting shows the aftermath of a perforating gunshot wound to the left arm: a metal probe passes through the wound canal. Bell noted that this patient developed complications – necrosis of the humerus (Gordon-Taylor and Walls 1958, Longmore 1866).

Three observations illustrate cases of the upper limb torn by a cannon shot at the level of the upper third of the arm. The first one shows huge gaping wounds; bone fragments can be seen⁸, the suture on the stump of the brachial artery is clearly defined. Bell noted that one of the patients (shown on painting 15), survived a 15 mile evacuation to Brussels, appeared before his doctor, and then fell unconscious for half an hour. By the autumn of 1815, all three had been discharged from the hospital, but were disabled (Gordon-Taylor and Walls 1958, Longmore 1866).

Another patient RAMC/95/1/16) had his left hand amputated after shoulder and elbow joints were completely shattered.⁹ This observation is peculiar because

of a tetanus complication. Opisthotonos began during wound dressing and treatment. For Bell, the death of this patient was expected (he knew of only two cases of recovery), but in August 1815 the doctor received a letter saying the patient was recovering (Longmore 1866).

In his travel sketchbook, on one of the sketches for the would-be painting (RAMC/95/1/17), Bell wrote that there were many of such cases of gunshot wounds to the limbs at Gendarmerie Hospital, and that he had already performed three amputations (Longmore 1866) that morning. He illustrated a gunshot wound to the lower third of the shin; the limb was swollen and reddened (graphic picture of phlegmon). Upon finger exploration of the wound, he found a large amount of bone fragments and tissue debris (Gordon-Taylor and Walls 1958) in the abscess cavity.

After returning home, exhausted, but having accumulated a wealth of professional experience, Bell embarked on a new series of primary amputations of limbs with much better results compared to those he had in Belgium. Out of 146 patients, 40 died (mortality rate of 27.4%) (Gordon-Taylor and Walls 1958). He also used the illustrative material he had accumulated. In the book titled “Surgical Observations” (Bell 1816–1818), Bell included several sketches from the Belgian sketchbook, and in “Practical Essays” (Practical essays... 1841), he included brief excerpts from the case histories he had accumulated during the period of the Battle of Waterloo. The graphic and multifaceted work on surgery (Bell 1821) is certainly also based on his military experience in amputating limbs and performing cranial trepanation.

This suggests that Bell’s sketches and paintings were initially meant to illustrate wounds and the results of surgical methods of treatment with the purpose of training other surgeons. However, today – in the era of endless local military conflicts – they acquire new meaning. Bell sought to remind people of the “shocking sights of woe” (Bourke 2017). The familiarisation of students with his work when studying certain aspects of general surgery and the history of medicine acquires didactic significance, while the raising of awareness and provision of accessibility for the general public play a crucial role in the proper interpretation of the unsightly realities of war.

RAMC/95/1/16).

⁸ Patient after traumatic amputation of the left hand by a cannon shot; the suture on the artery in the wound is visible; rope in the right hand to enable him to lie comfortably in the bed (RAMC/95/1/13). (<https://wellcomelibrary.org/item/b19476656#?c=0&m=0&s=0&cv=0&z=-.0.1486%2C-0.0407%2C1.2971%2C0.8148>).

⁹ Patient after amputation of the left arm with a quill in the right hand (Arm shattered, Voultz, Caserne Elizabeth, 1 July;

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About the authors

Nikolay Nikolaevich Krylov – Doctor of Medical Sciences, Professor at the Department of Human Studies, Institute of Social Science, FSAEI HE I.M. Sechenov First MSMU MOH Russia (Sechenov University), Moscow. Email: nnkrylov01@yandex.ru

Yana Grantovna Grigoryan – Candidate of Historical Sciences, Associate Professor at the Department of Human Studies, Institute of Social Science, FSAEI HE I.M. Sechenov First MSMU MOH Russia (Sechenov University), Moscow. Email: winyan@yandex.ru

Aftandil Vagifovich Alekberzade – Doctor of Medical Sciences, Professor at the Department of Surgery, Faculty of Medicine and Prevention of the FSAEI HE I.M. Sechenov First MSMU MOH Russia (Sechenov University), Moscow. Email: aftandil.v.alekberzade@gmail.com