A Heavy Reckoning

ALSO BY EMILY MAYHEW

The Reconstruction of Warriors
Wounded: The Long Journey Home from the Great War



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A Heavy Reckoning

War, Medicine and Survival in Afghanistan and Beyond

EMILY MAYHEW





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But if the cause be not good, the king himself hath a heavy reckoning to make, when all those legs and arms and heads, chopped off in battle, shall join together at the latter day and cry all 'We died at such a place'; some swearing, some crying for a surgeon, some upon their wives left poor behind them, some upon the debts they owe, some upon their children rawly left. I am afeard there are few die well that die in a battle; for how can they charitably dispose of any thing, when blood is their argument?

Shakespeare, *Henry V*, Act IV, scene i (speech by Williams, the Welsh Serjeant-at-Arms before the battle at Agincourt)

Introduction

THE CONSTANT OF ALL WARFARE, whatever the century, is the wounding of soldiers. In the play *Henry V*, one of the cultural cornerstones of British national identity, Shakespeare introduces a single character whose function is to do nothing other than remind the audience in raw and brutal terms exactly what casualty in warfare means for the dying, the dead and their dependants. Serjeant Michael Williams is an ordinary soldier whose simple voice articulates not only his fears about wounding but also deep misgivings about the likely costs of a military campaign portrayed in the rest of the play as honourable. It is his remonstration with the warrior king Henry that gives this book its title and provides its epigraph. We never find out what happened to Williams – whether he lived or died crying for a surgeon – but he, like Shakespeare, knew that to be a casualty from a battle like Agincourt in 1415 was almost certainly to be dead.1

But not always. This is a book about what happens to those wounded who somehow do not die on the battlefield. It is about the moment and the point of their wounding and what comes afterwards that ensures their survival. Times, weapons, battlefields all change, but for those who somehow do not die, the moment of their wounding – when their power is snatched away and replaced with chaos, dependency and pain – is the same across the centuries. In that moment, no matter how much the soldier has sought to prepare for the possibility of casualty, everything changes at the most fundamental levels of

human existence and function. One question fights its way to the forefront of the casualty's brain as they fall: what is happening to me? In the seconds or moments before help or death arrives, their brain struggles to provide some answers.

The immediate response of a soldier in the seconds after wounding is to rediscover what time it is. Being certain of the time tells them whether or how long they have been unconscious. Knowing when it is helps them remember where they are and allows them to plan their survival. But Time itself has transformed as they fall, fragmenting and dilating all at once, and getting it back under control can be hard. Few soldiers owned watches before 1920, so many of those who came to the First World War battlefield relied on the position of the sun in the sky – if the sun could be seen – to tell them that they had lain unconscious for hours, as men around them faded and died, as others lay paralysed watching and willing them to wake up. A soldier at the Somme managed to lift himself up from the mud of the shell hole where he had fallen to find white beads scattered around him. Time passed in some form – minutes or seconds, he never knew which – while he worked out that they were teeth, and that his jaw had been smashed open by a shell and he lay among the fragments of his own face. No soldier in the twenty-first century is without some kind of watch, where time and place can be told in the light or dark, but only if the device is undamaged and there is no crack in the face or fracturing of pixels distorting its output, blood clotting in its cells. Then the owner of the broken watch or phone is no better than their comrade in a muddy shell hole a century earlier, craving certainty, relying on daylight or its absence, prepared to accept even the vaguest hint from the world around them.

Sound, like time, becomes deranged after wounding. Soldiers lie and listen to the sound of their own blood being pumped around their bodies, or drum-dripping on to their uniform or the ground, tiny pats drowning out the sounds of the battle around them. A soldier at the Somme tried to stand and failed, so he lay back down quietly, focusing instead on

a gentle, repeating slurp of a sound, like sea surf, whooshing in out, in out. Its regularity gave him a kind of comfort until he realised it was his own breathing and that he could not, no matter how he tried, get it back to normal.

Movement. The ability to move, and to feel oneself moving in time, is crucial. No matter what, soldiers will be desperate to move, terrified that immobility will be mistaken for death. In 1942 an RAF pilot rescued from a downed aircraft awoke to find he was lying on a stone dock wall, completely covered by a heavy tarpaulin, hearing through the thick canvas the last rites being murmured above him. He managed to shift his shoulder, and the tarpaulin was snatched away, a horrified padre replaced by a mortified medic.

Blood. The soldier must find where they are bleeding from and try to stop it if they can, sparking their memory for the fragments of their first-aid training and kit. If they can, and there is much that can prevent it, the soldier lifts their hand and begins to pat along their body to find their wounds. Wounds are always wet, so each touch that finds dry fabric or flesh is a second of relief, before passing on. When one soldier behind a shattered wall after a night attack in Iraq felt his way to a sodden patch on his own back, the moments that it took him to bring his hand from his body to his face, to discover what it was, to taste it in the darkness, those few precious moments of not knowing were infinite and yet not long enough. Handto-mouth existence. Finally it was water he tasted on his fingertips, not the saline metal of his own blood. The bullet had struck his water bottle, drenching his uniform. Except that even at the moment when he had almost smiled with relief he knew that there was still a wound to find, because as he twisted to continue his search, it sent pain lancing through him from toes to teeth. Distorted in its path by his water bottle, the bullet had smashed on the edge of his body armour, fragmenting into metal shards, no longer one projectile but several, splattering his spine, his nerves, his intestines, shrouding him in pain.

Pain. Once pain finds its way in the body of the wounded

soldier, it claims its territory, over and over, surges of agony, no ebbing, taking over control of time, place, sound, movement. Pain takes everything from a casualty. Pain will stop them searching for wounded comrades around them, distort their fear and instinct for danger. Pain will make a casualty thrash and cry out, over and over, raw and piercing. The pain of a wound can burn hot, so hot that one casualty tried to pack the hole in his head with snow and mud from a frozen mountainside on an island in the South Atlantic. Pain will draw down enemy fire to finish its job and find more targets. Pain puts those seeking to rescue the wounded in the firing line. From the Somme to Omaha Beach to Tumbledown Mountain to Helmand Province, the first face seen by new casualties has a finger to its lips, shushing them, murmuring them to quieten and calm themselves, gently, reluctantly, necessarily placing their hand over a screaming mouth to stop the noise. Cries turn to sobs of relief, the casualty fighting to regain control with every breath as the medic deals with their bleeding, whispering comfort, protecting them both until the guns find other targets and they can begin to move to safety.

But whether twenty-first-century professional surrounded by their patrol group or First World War conscript, they are no longer the independent, fit young human who stepped on to the battlefield, knowing the plan and their place in it. From then on, the answers come from outside their own selves as their path twists into a distance they cannot see and they can no longer travel it alone. They have become dependent, a human being who is carried, set down, picked up and loaded into vehicles. Around them gather the men and women who work to keep them alive, looking down at them. In what is now a patient's eye line, if they can turn their head or strain to hear, are the others who fell with them, and then their questions become about those others and what is happening to them.

Modern ambulances have waterproof cots, so no casualty on the lower bunk will feel the blood of their comrades dripping down through the sodden canvas of the upper bunk on to their faces, as was often the case in the First World War, taking the sanity of survivors even as they sped on their way to safety. But the design of the vehicle hasn't changed that much, so even today those cots still hang close together. One night in Iraq a young soldier watched his best friend being loaded alongside him. When he did not respond to his calls, he reached out across the aisle to touch his friend's upper arm. The flesh he felt was chilled beyond warming in the close night heat, and he knew that somewhere along the journey, while he had fought to stay present, his friend had been lost. In Afghanistan, no one wounded was alone for very long, but they still felt the shift of time and space before their mates crowded in, before they got going on their first-aid training or a medic began their work, and the whump-whump of a helicopter's rotor blades became part of the soundscape. For others the shift was about fragments, dust, blue sky, a heartbeat under the soil, the dark of a cabin, flashes of tracer and then nothing at all, until waking into utter strangeness, still no idea of time or place, days after the point of their wounding.

But waking. Not dead. In the second decade of the twentyfirst century there is a small but significant group of people who have lived through situations of physical catastrophe on the battlefield previously thought unsurvivable. And there are people who have enabled that survival by standing at the limits of life and death and refusing to accept them. For me, this particular group of people are not sources from a history book or a radio interview or a letter home. Many of them are my friends and colleagues, and I work among them every day in a university department that researches military casualty. I may not know their birthdays, but I know the anniversaries of their wounding and I know how many times they have deployed to war zones and whether they plan to deploy again. I know what they take in their coffees, and I have a reasonable idea of when and why they are tired or in pain and pretending not to be. I understand where it is they go in their memory when they turn away from the conversation, look out of the window and

fall into silence. When they met me for the first time, I said, I am a military medical historian. I study the history of severe casualty in wartime and its consequences. So, based on that, sometimes when they turn back they ask me another version of the question they first asked of themselves on the battlefield, at their point of wounding. What will happen to them now and in the future – what will be their consequences? And when the medics turn back, they ask me what will happen to the people whose lives they fought so hard to save. And I know them all well enough to know they don't expect – would be offended by – anything but an honest response.

So this book is my answer, the best I can find, to their questions. And while I was thinking about it, I found I had a hard question of my own. What does it really mean to save a life, to bring a human being back from the furthest point of existence before death: what lies beyond survival? As I write these words, they remind me of the oldest of hard human questions: where did I come from? Except that in the case of these new, post-casualty lives, the better question is: where did I come back from? The simple answer is: from a small war fought far away and for much too long. From Afghanistan, where, between 2001 and 2014, 456 British service personnel died and 1,981 were wounded – and for the purposes of this book, being wounded means requiring the activation of a trauma team at the military hospital in emergency response. The longer answer is: from a place where significant numbers of casualties did not die, even though the medical textbooks and all previous experience said they should have. A place where they were officially, and for the first time in military medical history, designated 'unexpected survivors'.

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The first time I gave the answer that has become this book to my colleague who asked his hard question, I tried not to. I prevaricated, and made jokes about my research being all

boring history, and pretended to be distracted by other people around us as we sat at a white plastic table in one of the college cafés. But he's a double amputee who lost both his legs to a bomb buried in a compound floor, who doesn't hide his scars, who's never been inclined to take no for an answer, and he wouldn't have it. So I told him that there is nothing straightforward about what is going to happen to him. Above all, and he knows something of this because he's been researching it for a while himself, the nature of his injury, the one he has survived, has consequences that will last for his lifetime. There are two reasons for this, and they are intertwined and immovable now, in his DNA. First reason: his wounding wasn't just ordinary trauma; it was blast injury. To survive blast injury, a casualty needs not just resuscitation but extreme resuscitation. And that extreme resuscitation, the kind that almost always happens when someone is an unexpected survivor, kick-starts extreme processes inside the human body that cannot be stopped or reset. Although we can bring people back from this point of wounding, closer to death than ever before, something happens to them there that we don't yet understand. Second reason: the blast injury itself, beyond the point of wounding. Blast alters everything: the way cells heal, the way skin scars, the way bones grow back, the way brains operate. Blast affects pain, memory, resilience, every basic human process of life.

In essence, extreme resuscitation and blast injury mean that unexpected survivors suffer and age more quickly than people who haven't been as close to death as they have. They mean that, although we think of this as a very modern war, with the most modern medical technology and skills equipped to deal with casualty, something has happened to the survivors that has a place in the oldest human mythologies. They did not die, they were not allowed to die, death retreated, life held the ground, a pulse beat where there should have been none. But at a price. Death gave way only after a negotiation. The price: life now, less life and of poorer quality later. Myth and science, the deal with death a reality on the battlefield and in the lives beyond.

When I had finished, we were both silent, and I had no idea what would come next except (selfishly) I hoped I had not just lost a friend. A few seconds passed. Then he said, but what we have to remember is that I didn't die. Whatever comes next, I survived. Exactly, I agreed. You didn't die. And we nodded and drank our coffees, and our expressions somehow aligned. He went on. And we know about this now, and we can try and do something about it. Yes, I agreed. We must, we absolutely must. For my friend, who went back to his research office that day, and is still my friend, and for the others.

In the few seconds that passed between my answer and his reaction I stopped being a military medical historian and became something different, hopefully something more useful: a historian of unexpected survivors of severe military casualty. It meant I had to broaden my research to encompass the work of the medics who saved them and of the clinicians and scientists who are racing to understand all the complications that cannot yet be healed, the processes that have been started and cannot yet be stopped. But it's exciting work, because at its heart is a single dynamic entity, with such potential to generate change. The unexpected survivors of Britain's Afghan war are a casualty cohort: a group of individuals sharing a common symptom or characteristic acquired at the same time and as a group, and observable over time as a group.² If you think twin studies are useful, cohort studies are the gold standard of research tools. And the Afghan cohort membership is as powerful as they come: all young men, with known medical histories and detailed records maintained from their point of wounding. Everything the researchers will need going forward, hopefully going forward fast and delivering results. But not just for them.

They stand as representatives of something much larger, much bloodier, made up of men, women, children, every kind of human you can imagine. Our unexpected survivors are outliers for an entire global population of survivors of blast injury. Everything you learn here applies whenever news breaks of an

explosion in Turkey or Paris or Brussels or Kabul or Karrada in Baghdad or Raqqa or Aleppo. Remember it every time you hear of the legacy minefields and their victims in Cambodia or Libya or Somalia or Bosnia. This is what happens every time a human being, no matter what their background or medical history, is blown off their feet, almost to pieces, by explosions, war or no war, or what is not recognised as a war.

Mostly I'll be referring to the mechanism of injury as IEDs (improvised explosive devices), but recently a weapons expert said that this acronym is out of date. There is nothing improvised about the ones being found in 2016: they are identical, mass-produced by a workforce that moves around to deliver its products where its leaders need them next.3 Many more, better made but still the same blast wave. Not as many unexpected survivors in countries with second-hand ambulances and nothing resembling trauma teams, but every time more people do not die. And all with the same prospects unless things change. So this is not only part of our national covenant, it is a global casualty imperative.

As a historian, I know that we have been here before, a century ago. Wounds inflicted in the First World War by massive shells exploding into humans are very much the same as IEDs and mines that exploded into humans along the roadside and in compounds in Afghanistan. Catastrophic trauma to upper and lower limbs – arms and legs chopped off – great ragged blooms of injury, immobility, bleeding, death close by, closer with every pulse beat, unless someone who knows what they are doing can get there quickly and snatch life back. And then the complexity thereafter and for a lifetime. Which is why this book is mostly (but not entirely) about blast injury that causes limb loss, and why it focuses on Afghanistan, where there were hundreds of these injuries (not Iraq, where there were fewer than twenty, but hints of what was to come). Because in all

their stages and across a century these injuries are the greatest numerical and medical challenge.

A challenge where every moment counts, and so when I studied the casualties of the First World War, what I focused on was their journey from the point of wounding all the way back along what was called then 'the carry' and is now called 'casevac' (casualty evacuation). I searched in diaries and letters and journal articles for this most fundamental process in all of military medicine. Piece by piece I came to understand the skill and determination that were required to save a life and keep it saved, under fire, in the worst conceivable conditions. How a little training and an entire hell's worth of experience not only delivered unexpected survivors to operating theatres and hospitals for reconstruction but also delivered the system that is used by Britain's military medics today - refined to extraordinarily expert levels but based on the same principles nonetheless. Move the hospital as close to the point of wounding as it will go, bring clinical capability in all its forms as far forward as it can be sustained. Train everyone to stop bleeds. If they can't stop a bleed, it's not worth going out, medic or soldier. Blood, as Shakespeare's Michael Williams puts it so clearly in *Henry V*, is the argument, whatever the century.

So when I came to research how unexpected survivors came out of Afghanistan, I looked for the same kind of sources that I had used for the First World War. Historians are worried about researching in the digital age: unsaved emails, everything typed into garbled word-processing programmes we can no longer read, degraded hard drives, mountains of low-resolution photographs without captions. Except that it turned out that much of the source material was the same – everyone writes emails when they deploy, but they keep diaries too, and they write poetry, and when they write something important to them, that helps them cope: they print it out and stow it carefully and bring it home. Apart from the biro (diaries from the First World War are usually in pencil or crayon – fountain pen only when there was no risk of the ink bottle being smashed),

they could be the same. I've worked with colleagues whose written narrative style can only be described, as kindly as possible, as clinical. But not when they wrote their diary, sitting in the hard sunshine, outside a hospital in a desert camp. Just like their colleagues from a century before, today's service personnel who keep diaries on deployment write fluently, without crossing out, the memories of the day streaming on to the page. Thought to word on paper, handwritten, no need for a spellcheck, no worrying about how it will seem, no peer review, no sense of a readership at all, but knowing that they must get it down somehow. And again, just like their predecessors, noticing and drawing comfort from the same things - sunrises, better weather, very dark skies and kaleidoscopes of stars in them, timeless geological features in the distance, animals, mugs of tea.

I never expected diaries, but once I found them, I paid attention, and I looked as I had during my First World War research for handwritten sources. A single reference in a mother's memoir of the death of her son alerted me to another kind of diary: a patient diary. I wasn't the only person concerned to answer the question 'What happened to me?' Medics in Afghanistan, who brought in and treated casualties who didn't regain consciousness before they were sent home, wanted them to know what had happened to them while they slept. How hard the team had worked for them, and what they would have heard at their bedside if they had been awake. So they wrote it down, by hand, in little printed books, that became an hour-byhour account of their saving, even when in the end it wasn't, from the people who held death at bay as long as they could. Not a medical record but a diary, voices, thoughts to words on paper, from medical staff and, when they got to hear about it, friends who asked to write in them too - those friends who hadn't really written anything not on a keyboard since school but who instinctively understood that this little book was all they needed. Patient diaries are the finest medical primary source I have ever worked with. There is simply nothing else

like them anywhere. They let us follow every single step in the journey back, and you won't need a medical dictionary to decipher the wording because these are written for humans by other humans in their own voices, who watch as they endure the first few hours of their survival. These are other answers, invaluable, to the very first hard question.

Questions and answers. Face to face, soldiers and their medics spoke to me with patience and illumination. One of my earliest interviews was with a consultant anaesthetist who served in both Iraq and Afghanistan multiple times. Like all anaesthetists, he works at the head end of patients, so he's good at reading details upside down. As I took my notes he would lean over the desk and point out corrections in what I had written, or make additions, or drew an arrow so that things connected up. He didn't even think about doing it, and neither did I until I went back to type up my notes and saw what sense they made. A military surgeon gave his answers in well-organised paragraphs: out it came, piece by piece, and I broke off from writing to ask if he had told his story many times before. He said no, never, this was the first time. It was waiting there for him to speak it, ready and clear. A physiotherapist, sitting in a beautiful garden that he had built for his amputee patients, talked and talked about so many important things that my pen ran out and I had to go and beg another from inside the rehabilitation centre offices.

I had two particular advantages. First, timing. This book was commissioned by Wellcome Collection in December 2014, as the very last British service personnel left Afghanistan and everyone's thoughts turned from deployment to post-deployment (the official military term for what happens next). And second, I came to them from a good place — one that had already established a reputation for cutting-edge medical and scientific research into the long-term consequences of complex casualty. So when those I hadn't met googled me, they found my personal web page, and saw that I am officially the Historian in Residence in the Department of Bioengineering at Imperial College

in London, where I work primarily with the scientists and clinicians of the Royal British Legion Centre for Blast Injury Studies.

It's an unusual post – actually, it's unique. I am the only historian in residence in a university science department in the country, courtesy of an imaginative Head of Department and Centre Manager, neither of whom could think of a reason not to have a historian on the staff. Which is how every day I work with scientists, medics and military medics, engineers and bioengineers, surgeons, geneticists, physicists, patients turned researchers, rehab specialists, mathematical modellers - someone 'who knows how to hit things really hard and then measure them' – because that is the range of skills required to study the consequence of severe blast casualty. I've learned long and complicated phrases such as 'musculo-skeletal dynamics' and 'heterotopic ossification' (and I repeat them to myself at home so I can say them properly in meetings and avoid giving my colleagues a reason to think that historians aren't worth the bother). I've learned about load-bearing and joint mechanics and the bioengineering of hard and soft tissue. I understand that I work in the best place in the world to do this work, and that gives me hope.

And in turn they have learned that much of what they do, the lines of enquiry they follow, started a century ago and was then dropped. That the consequences of this were dire and often deadly for all the thousands of unexpected survivors of the First World War. I've explained why this happened in research seminars and strategy meetings and in this book – and they understand, and are alarmed by how much they recognise as being in play now, after this century's war. And most of all I emphasise to everyone involved at every level that, if they don't follow through, if their work is too slow or is wasted, the consequences will be dire all over again. And this time I'll be sitting at the back, taking notes, for another, angrier book. A different kind of reckoning from this one.

Which takes me back to Serjeant Michael Williams, sitting by a campfire angry at a king, because he knew that after every war, when men die or do not die, there will always be reckonings to make. This therefore is mine. A heavy reckoning. A long answer to a hard question, an account of the human costs and consequences of a small war, fought far away and for too long (a timeline follows). And the reckoning begins, as all wars do, no matter the century, with the point of wounding, at the first moment a soldier falls and what happens to them there while they do not die.

The War in Afghanistan: Timeline

2001: In the aftermath of the 11 September attacks in New York, British Special Forces troops support US strikes on Al Qaeda and Taliban targets in Afghanistan. An interim Afghan government is established and an International Security Assistance Force (ISAF) assembled to bring stability to the country.

2002: The British Army and Marines deploy units to Kabul as part of ISAF, in an operation named Herrick. The first British soldier is killed in Afghanistan. The British contingent of ISAF undertakes counter-terrorism and counter-narcotics operations, provides security in the capital, Kabul, and trains Afghan national security forces.

2003: NATO is given control of ISAF. ISAF's remit is gradually expanded to cover the entire country to support the interim government and the electoral process and to restore infrastructure.

2004: Second British soldier killed. Announcement of largescale deployment of British troops to Helmand, focusing on counter-insurgency and counter-narcotics operations.

2005: Construction work on the British base of Camp Bastion begun, including a standard tented field hospital facility.

2006–7: Britain's Task Force Helmand, initially 3,300 personnel,

deployed into the large, ethnically and tribally diverse province in the south of Afghanistan as Operation Herrick IV. The Task Force is not intended to be involved in day-to-day fighting, but is primarily meant to support development assistance to the Provincial Reconstruction Team working in the two major towns in Helmand: Lashkar Gah and Gereshk. The insurgency grows steadily, requiring troops to move into outlying towns and forward operating bases. From either larger forward operating bases or smaller patrol bases, either specially built or adapted from existed buildings (sometimes forts or more often ruins of compounds and villages), the British forces mount attacks on villages or settlements to clear them of insurgents. At its peak this Task Force would comprise almost ten thousand men and women, on six-month tours of duty, primarily rotating between Camp Bastion and a growing network of forward bases.

2008: Casualties mount, at least six thousand on all sides, requiring the tented hospital to be replaced by a hard-build facility at Camp Bastion.

2009: 'Why we are in Afghanistan' statement released via the MoD web site:

Our objective is clear and focused: to prevent Al Qaeda launching attacks on our streets and threatening legitimate government in Afghanistan and Pakistan.¹

The year of the IED. Helmand is recognised as the most violent province in Afghanistan. Britain has 137 separate bases across the area, from smaller patrol bases to larger forts – forward operating bases. For the first time, most casualties coming into the Field Hospital at Camp Bastion are from mines and improvised explosive devices (IEDs), not gunshot or artillery wounds. The British are overwhelmed in the province and gradually hand over military operations to the US

Marine Corps. They continue with efforts to train the Afghan National Army, to create stable governance structures and economic development. Troops continue to operate from forward operating bases to liaise with local populations. Special forces and intelligence assets are diverted from high-value work against commanders in the province to combat those building and laying IEDs.

2010: In the hospital at Bastion, this is known as 'the year of the hammering'. IEDs continue to kill and maim, regardless of strategy, tactics or changes in vehicle armouring.

2011: The worst year for civilian casualties so far. Twentyseven thousand people are displaced in Helmand Province.

2012: Britain announces it will begin to scale back its military involvement in Afghanistan, handing over to the Afghan National Army (ANA).

2013: Thousands of civilian deaths and displacements continue. Much of the Afghan refugee population that will eventually reach the shores of the Mediterranean begins its journey here.

2014: Britain withdraws the last of its forces from Afghanistan. Camp Bastion is handed over to the ANA, including a scaleddown hospital. ANA casualties remain steadily high. IEDs do not recognise the British withdrawal and continue to explode.