WAR AND MEDICINE

wellcome collection

DEUTSCHES HYGIENE-MUSEUM DRESDEN

black dog publishing
london uk

CONTENTS

FOREWORD

Ken Arnold, Klaus Vogel and James Peto

Having described the litany of appalling injuries endured by his fellow patients in the beds and wards around him, the narrator of Erich Maria Remarque's *All Quiet on the Western Front*, 1929, concludes: "Only a military hospital can really show you what war is". It is not just the physical devastation suffered by the wounded that is inescapable. A military hospital can also show us the full, bewildering range of stark choices and moral dilemmas that confront those charged with the delivery of medical care during wartime. From the sometimes counter-intuitive principles of triage, to the arguments over whether and how post-traumatic stress can be clinically diagnosed, war hugely complicates the already difficult ethics of the practice of medicine.

This book is published to coincide with the exhibition *War and Medicine*, organised jointly by Wellcome Collection and the Deutsches Hygiene-Museum, Dresden. Both book and exhibition concentrate on the modern era, beginning with the disasters of the Crimean war and continuing through to the current conflicts in Afghanistan and Iraq. As mankind has developed increasingly sophisticated weaponry with which to harm its enemies, medicine has had to adapt to cope with the volume and the changing nature of the resulting casualties. The exhibition combines military and medical artefacts with interpretative approaches to understanding the relationship between war and medicine, including historical and contemporary artworks and film. The book brings together very different approaches to the subject. It interweaves the arguments of academics and historians with personal accounts written by those with first-hand experience of trauma and its treatment during or in the aftermath of conflict.

It is often argued that, for all the destruction war has brought, it has at least been good for the development of medicine. Set against this is the uncomfortable fact that medical scientists and military leaders have sometimes responded not only to the medical needs of war, but also to the medical 'opportunities'—leading to unscrupulous experiments and even to genocide. That the nature of the relationship between warfare and medicine is much disputed is borne out by the strong and sometimes contradictory convictions expressed in this book. What is certain, however, is that a great deal of time, money, energy and expertise continues to be directed into areas of research where military and medical interests intersect, and that war and medicine continue to influence one another in ways that are critical to the lives of many—both soldiers and civilians.

Finding a way through the maze of issues that surround this subject, in order to realise both the book and the exhibition, has required the hard work and help of many people. There is only space here to thank a small number of them. First and foremost are the curators of the exhibition, Kate Forde and Lucy Shanahan, and their colleagues in Dresden, Colleen Schmitz and Stephanie Neuner. We are particularly grateful for the help given by the medical historians Ana Carden-Coyne, Roger Cooter and Susanne Hahn and by the freelance curator Angela Weight. Thanks are also due to Dr

Harvey Pynn of the Royal Army Medical Corps, John Parrish, Director of Center for Integration of Medicine and Innovative Technology, Boston, and to the artist David Cotterrell, for their sound advice. We thank all the writers who have contributed directly to the book and especially Melissa Larner and Nadine Monem, who have not only edited and produced it, but also played an important role in shaping its contents. We also thank Wolfgang Eckart for lending pictures from his collection.

As mankind's capacity to maim and kill has increased, our desire to repair and heal has always struggled hard to keep pace. We hope that this book, with its combination of eye-witness accounts and historical analysis, will encourage a wider engagement with the medical and moral complexities of that struggle.

Ken Arnold and James Peto
Wellcome Collection, London

Klaus Vogel
Deutsches Hygiene-Museum, Dresden

PREFACE
WAR AND MEDICINE, PAST AND FUTURE

John A Parrish

Throughout history, war has inflicted massive physical harm and has added substantially to the burden of malnutrition and disease. It is ironic, therefore, that war sometimes advances the practice of medicine. Some of the essays in this book record the complex ways in which the medical profession has responded to the challenges of war, and has struggled to care for the injured against the odds. Others argue that their discoveries have brought widespread benefit to soldiers and civilians, in both war and peace.

From a global perspective, the participants in most serious conflicts use hand-held weapons to kill and maim and there is essentially no medical care. Industrialised, developed states have the technical, intellectual and fiscal resources to cause widespread death and destruction from great distances and with high efficiency. Those with the most advanced killing machines are also those able to provide medical care for their wounded soldiers.

Technological advances continue to increase the destructiveness and lethality of weapons, the dispersion of soldiers and medical responders, and the capabilities of health professionals. However, whatever gains physicians make in salvaging soldiers and maintaining maximum fighting strength are largely swamped by the massive killing of civilians as a tool of war.

When one considers the intersection of war and medicine, the focus is often on the increased capability to care for individual badly wounded soldiers. But it is the advances in preventative health measures, as well as sanitation, hygiene, processed food and water, window screens, insect repellents, vaccinations and other such measures that have had the greatest effect on the quality and duration of a soldier's life. All of these measures are overshadowed, however, by the widespread and often lethal social, political and economic disasters spread by war. The technology of killing (and the willingness to use it) grows much more rapidly than the ability to care for victims. This is only to be expected, since it is easier to destroy than to repair—and the resources provided for destruction by society are greater.

Nonetheless, the capabilities of military medicine are constantly progressing. Current research and development efforts are leading to an improvement in the proximity of the wounded to surgical teams. New technologies are advancing the control of hemorrhage, the monitoring of the wounded, the treatment of shock, and the prediction, management and remedy of sepsis. Tissue engineering will be used to treat spinal-cord injuries and replace organs. Sophisticated life-like autonomous simulators will provide better training of first responders, while robotic devices will extract wounded soldiers from dangerous places and improve prosthetics. 'Smart' devices will also improve rehabilitation and therapy after wounded soldiers return home.

These advanced capabilities will also be useful for civilian victims of trauma and natural disasters. This 'dual use' of technology is becoming more important as terrorism blurs the boundaries between the battlefield and the city square.

Not all war wounds are visible. Each major war has left a signature constellation of symptoms or neuroses that was called 'shellshock' during the First World War and referred to as Post Traumatic Stress Disorder (PTSD) in more recent times. The physiological, biochemical and psychological causes and manifestations continue to be poorly understood and a great deal of controversy surrounds this subject. Because of lack of effective treatments, the victims may suffer for decades after their war experiences. Following each of the past six or seven major wars, society and the military have gone through cycles of denial, exaggeration of these invisible wounds, and finally a more permanent form of denial – ignoring and forgetting the victims. Increasing advances in modern neuroscience research are creating a platform for a significant increase in the understanding, prevention and treatment of war-related psychological wounds. But to realise this potential, significant financial and intellectual resources would be required, as well as a climate of sustained public concern, and the enlightened selection, training and deployment of soldiers.

Medical advances will not change the essential nature of armed conflict. Death or maiming of both combatants and innocent civilians remains the goal. Nations or groups will war against one another and the winner will be the one who can inflict and absorb more punishment than the other. War will continue to challenge healthcare providers, as well as yielding much relevant clinical experience and strong incentives for biomedical researchers. Individual physicians will continue to make incremental improvements in the care of trauma, chemical assault and infections.

Throughout history, when the professions join forces, medicine serves the military and the war machine serves the state. In time of war, it is the state that decides the magnitude and quality of the care of war victims, with some help from volunteer agencies. This book chronicles the struggles of caregivers to serve these efforts to improve care. The goals are to maintain fighting strength and soldier morale, assuage the angst of citizens unwilling to accept the human cost of war, and meet a moral obligation to wounded warriors. But we can imagine a world in which the military serves healthcare. The transportation, communication, entertainment and information industries are driving the creation of an enormous exponential growth in technology. The weapons industry helps generate this explosion of technology, and benefits greatly from it. Medicine is inadequately resourced and motivated and is incapable of capturing the full technological possibilities available. Fragmented healthcare industries create relatively little push in terms of technology.

We can hope that the privileged states will someday choose to provide the necessary resources to assault the curse of poverty and epidemic death from treatable diseases. The military establishment could supply the political stability and logistical distribution capability to overcome many of the impediments to improved global health. *All things are possible.*

WAR AND MEDICINE IN THE MODERN ERA

Mark Harrison

Clemance Brophy, 34th Regiment, wounded in the Crimean War, 31 August 1855. Photograph by Robert Howlett and Jospeh Cundall, commissioned by Queen Victoria.
The Royal Collection

The mid-nineteenth century is often said to mark the advent of modern warfare. It was at this time that war began to be organised on an industrial scale—harnessing the relentless might of the steam-powered factory. This began with the Crimean War (1853–1856) and American Civil War (1861–1865) and culminated in the two great world wars of the twentieth century. In its mature form, modern warfare was epitomised by soulless destruction, mass mobilisation, and by new and terrible weapons that turned killing into an industrial process. War became less and less about face-to-face combat and more about killing at a distance, with rifles, machine-guns, torpedoes, high-explosive shells and poison gas.

By the time of the Second World War (1939–1945), aerial bombardment had come to dominate strategic thinking as the ultimate means of destroying a nation's productive capacity and morale. Traditional distinctions between service personnel and civilians were becoming less relevant when nearly everyone contributed to the war effort.

The birth of modern warfare coincided with the emergence of medicine as a modern profession. Around the middle of the nineteenth century, medicine began to assume a form that we would easily recognise today. It was at that time that medical qualifications began to be standardised and medical registers drawn up. But while the medical profession now had a legal monopoly to practice medicine, it retained much of its autonomy, having the right to regulate the conduct of its own members. These measures helped to consolidate the profession and boost its public standing, as did some notable scientific advances such as anaesthesia, antiseptic surgery and bacteriology. These enhanced the capacity of medicine to cure or prevent disease, or at least to reduce suffering.

Although the modern medical profession owed its existence to several social trends, it was not entirely coincidental that it emerged around the same time as modern warfare. Like modern medicine, modern warfare was part and parcel of a new professional society, in which status depended increasingly on scientific expertise rather than upon birth. Just as warfare was being purged of its

William Young, Henry Burland and John Connery, wounded in the Crimean War. Photograph by Robert Howlett and Jospeh Cundall, commissioned by Queen Victoria.

charismatic, aristocratic elements, so medicine was becoming standardised with a clearly defined curriculum in which scientific training counted more than the tacit knowledge imbibed within the profession. This is not to say that social class ceased to matter, either in the military or in the medical professions, but that such distinctions became progressively less important.

But there was also a more direct connection between modern medicine and warfare. The advent of 'total war' drew in much of the adult population, either as combatants or workers, placing manpower at a premium. Every effort was therefore made to prevent sickness and to restore patients to some kind of useful role. As expectations of health and medical care rose, medicine also came to play a more important part in morale. The sanitary reforms of the Victorian era and inoculation against diseases such as typhoid did much to diminish fatalism in the face of even common diseases. At the same time, the curative powers of medicine were increasing. The advent of antiseptic surgery and of anaesthesia made even complex operations—such as abdominal surgery—seem possible.

A large snake, symbolic of a gas attack, strikes at a sleeping soldier, First World War. Drawing by L Raemaekers.
Wellcome Library, London.

The emergence of new drugs, like Salvarsan for syphilis and sulphonamides and penicillin in the coming decades, had an even more remarkable effect upon public confidence. Needless deaths from disease and wound infection were no longer to be tolerated.

At the beginning of the Crimean War, however, there was only the faintest glimmer of public concern over the health of servicemen. When the British and French dispatched their expeditionary forces to the Black Sea in 1854, they gave little thought to medical provisions. Sick and wounded men often lay at the front, exposed to the elements, or perished in the unsanitary conditions of hospitals at the base. It was not that generals were particularly callous, or that military doctors were incompetent, as some observers later claimed. Rather, the nations involved had not fought a large war for some time; war ministers, generals and senior medical officers were all largely inexperienced in planning the logistics of a major campaign.

But, for all its horrors, the Crimean War marked a new beginning for military medicine. For the first time, medical care for servicemen became a matter of acute public concern. Although there had been consternation following the massive death toll from disease during the French Wars of 1793–1815, there was a sense that such deaths were inevitable, especially in tropical regions like the Caribbean. Nor did most people expect medical care for the sick and wounded to be anything other than rudimentary. By the time of the Crimean War, however, expectations had begun to rise in line with sanitary reforms and the proliferation of charitable hospitals for the poor. A fusion of humanitarian and patriotic sentiments impelled well-connected individuals in all the combatant nations to organise medical relief for troops. This was the first war that was extensively reported in the press, and correspondents such as William Russell brought the war home in a way that had never been done before. His reports from the Crimea caused a great scandal and leading the Secretary at War—Sidney Herbert—to implore Florence Nightingale to organise female nurses for the military hospitals in Turkey. In Russia, too, Grand Duchess Elena Pavlovna founded the Community of the Cross, an organisation that aimed to recruit doctors and nurses to help troops at the front.

Queen Victoria and Prince Albert visiting soldiers in hospital, injured in the Crimean War. Drawing by John Tenniel, 1855.
Wellcome Library, London.

Nightingale's work in the hospital at Scutari has received so much attention that it will already be familiar to most readers. There is no doubt that she worked tirelessly to improve conditions there: compiling statistics, attending to sanitation and hygiene, and checking personally on her patients. She wrote continually to Herbert requesting more supplies and clothing, and enlisting his help in overcoming what she perceived as the obstructive attitude of military doctors. Similar stories were later told by other medical volunteers sent to the Crimea, such as Dr Pirogov, who denounced the stupidity of the Russian army doctors and their hospital administration.

In some cases, these charges may have been a little unfair, since medical officers could do little by themselves to alter conditions. Indeed, many had tried to do so but had failed because they lacked full military rank and because they were not politically well-connected. It was in this respect that Nightingale's presence was to prove vital. Her close relationship with Herbert enabled her to cut through military red tape and go over the heads of commanding officers. Once the scale of the problem was grasped, the War Office also responded in a determined manner, knowing that its actions would be closely scrutinised in the press.

The Crimean War also resulted in root-and-branches reforms of the army medical services and lasting improvements in the health of servicemen. Systematic training was introduced for all new medical officers, smart new hospitals were constructed, and far more attention was paid to sanitation and personal cleanliness. The results of these reforms were impressive, the death rate in garrisons in Britain falling from 17.5 per 1,000 in 1857 to 9.3 by 1875 and to 4.3 by 1899; the number of admissions to hospital also dropped from 105 per 1,000 per annum in 1857 to 67 per 1,000 by the end of the century. Similar falls in mortality—though not in sickness rates—occurred in major overseas stations such as India.

The Crimean War had shown that governments—particularly democratic governments such as Britain—could no longer afford to neglect the health and welfare of servicemen. Indeed, in the coming decades, humanitarian scrutiny of wars became even more intense.

Wounded being treated at Rezonville during the Franco-Prussian War. Coloured wood engraving by HIA Closs. Wellcome Library, London.

Having witnessed the suffering of the wounded at the battle of Solferino in 1864, Henri Dunant was determined that a neutral body should be formed to provide for the wounded of all combatants, regardless of nationality. The International Red Cross movement that he founded in 1864 proved to be a powerful force in the coming years, and an even more powerful symbol of benevolent neutrality, mitigating some of the horror of war for its survivors. By the time of the Franco-Prussian War, its tremendous emotional appeal was evident in the numbers of neutral doctors, nurses and orderlies who flocked to tend the wounded of both sides.

But in some cases, their intentions were not entirely philanthropic. A number of medical officers from the armed forces of other countries volunteered their services, at least in part in order to observe the medical work done by the French and Prussians, and to learn from it. It was for this reason that the British surgeon Thomas Longmore went to France in 1870, and what he learned of Prussian casualty evacuation deeply impressed him. The Prussians made extensive use of railways to evacuate their wounded, as well as specially adapted horse-drawn carts. Many observers were also struck by the fact that the Prussians had far fewer sick men than the French, particularly cases of smallpox. The French had vaccinated very few of its troops and suffered over 200,000 cases of smallpox; the Prussians, who strongly encouraged vaccination, suffered only 4,800.

The Franco-Prussian War was thus to prove instructive in all kinds of ways: by highlighting the potential contribution of civilians to medical work in wartime, in preventive medicine, and in the evacuation of the sick and wounded. The same was true of the American Civil War. The efficient organisation of evacuation in the Union Army provided an inspiration to the British Army right through to the First World War (1914–1918). However, the Civil War is also interesting because it provides an excellent example of how war can stimulate the emergence of new medical specialities: in this case, neurology. During the war, some 10,000 soldiers were discharged from the Union Army with so-called ‘nostalgia’—a delibitating form of depression and home-sickness—and twice as many with ‘epilepsy’ (in reality a stress reaction to

Officers saluting the wounded after the battle of Lewinsville, American Civil War. Engraving by F Skill.
Wellcome Library, London.

battle). This loss of manpower acted as a spur to therapeutic innovation and the diversion of resources to doctors with an interest in neuro-physiology, enabling them to create specialist hospitals for the treatment of nervous disorders.

By the end of the nineteenth century, practically all armed forces possessed specialist institutions for training military doctors and for the treatment of servicemen suffering from disease and injury. But it is important not to give an impression of unmitigated improvement. On active service, serious losses due to disease and other medical failures continued to occur. This was particularly true of colonial campaigns, over which there tended to be less public scrutiny. It was one thing to maintain hygienic standards in a military camp and quite another to do so when moving rapidly through tropical rainforest, mountains or desert. To make matters worse, some officers took little interest in sanitation, believing it to be beneath their dignity. During the Spanish-American War (1898) and the South African War (1899–1902), thousands of soldiers fell ill and died as a result of diseases such as typhoid, most of which were regarded as preventable.

Regimental Aid Post, Western Front, First World War.
Wellcome Library, London.

If these two campaigns provided an object lesson on how not to organise a war from a medical point of view, then the Russo-Japanese War (1904–1905) provided some positive examples to follow, at least on the Japanese side. The Japanese had learned a lot from the British and the Germans, both in terms of medical teaching generally, and about the organisation of medical care in wartime. They paid a great deal of attention to arrangements for evacuation and treatment, while insisting on strict hygienic standards. They also harnessed medical science—particularly the new sciences of bacteriology and immunology—more effectively than any other nation. For the first time in a major modern conflict, deaths from disease were lower than deaths inflicted in battle.

While some medical officers suspected that these claims were inflated, they helped to persuade governments and commanding officers of the importance of medicine in war. In the decade after the war, a number of generals even began to write articles on sanitation and strategy, seeing the possibility of gaining an advantage over opponents with less developed medical services. By the beginning of the First World War, these ideas were firmly implanted in the minds of many generals and government ministers, as were the political implications of being seen to fail in the state's duty of care towards its troops. It was not simply that expectations regarding health and medicine were rising in tandem with scientific and sanitary advances; governments had also forged new contracts between themselves and the people, promising better health care in return for responsible citizenship.

During the conflict of 1914–1918, health and medicine thus attained a position of central importance. On the preventative side, governments did their best to ensure that troops were protected with such inoculations and vaccinations as were available, and that all forces going into battle received lectures and, if possible, instruction in the prevention of disease. Special emphasis was placed upon the responsibilities of officers, who for the first time were made clearly responsible for the health of their men. On the Western Front at least, such measures paid real dividends, and endemic diseases such as typhoid claimed very

Casualties of the Dardanelles being carried in an open boat to the military hospital ship Dongola at Anzac, 1915.
Wellcome Library, London.

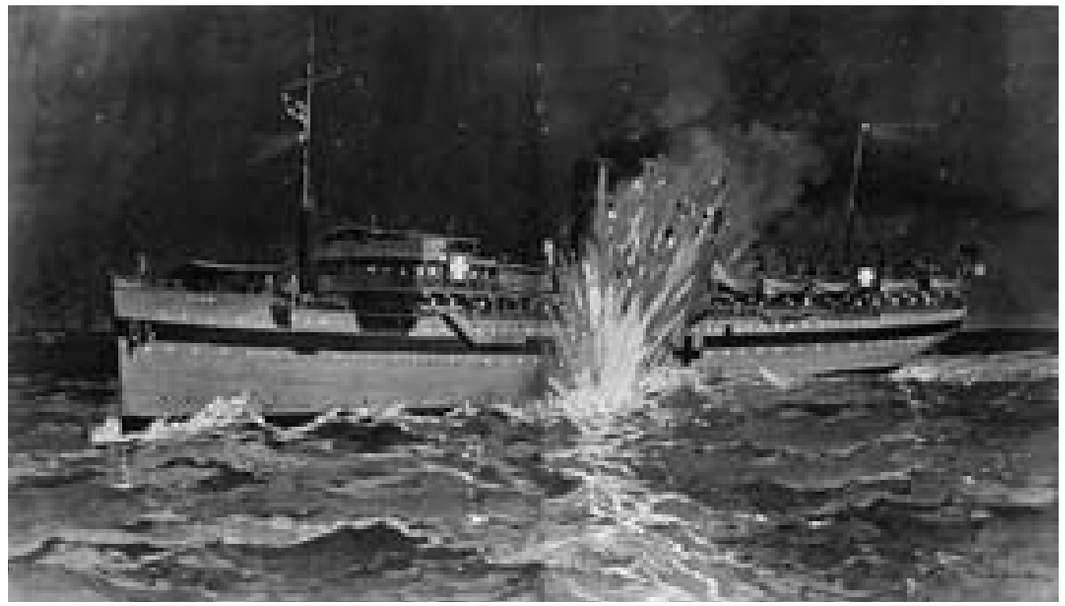
few casualties compared with the tens of thousands that had plagued military campaigns as recently as the one in South Africa. Well-organised sanitary divisions, mobile laboratories and improvised sanitary equipment for the trenches also helped to keep the spread of water—and fly-borne diseases to a minimum. But louse-borne diseases such as typhus and relapsing fever presented more difficult problems. Despite disinfecting stations, portable disinfectors and regular cleaning, lice were everywhere in the trenches, and relapsing fever placed a heavy strain on manpower. But the armies on the Western Front were spared the ravages of typhus, a disease that was already endemic on the Eastern Front. No theatre managed to avoid influenza, however. The deadly strain of the 1918–1919 pandemic swept rapidly through troops on all fronts, there being nothing that could be done to prevent it.

Despite many thousands of deaths, there was no public outcry over the handling of the influenza pandemic; public morale only seemed to be dented when troops died from diseases that were regarded as preventable. This was very much the perception of campaigns outside northern Europe. In Gallipoli, East Africa, Mesopotamia and Salonika, as well as on the Eastern Front, operations were sometimes severely affected by disease. To be sure, it was not all the fault of commanders: the prevalence of diseases such as typhus and malaria among the civilian population made the task of disease-prevention exceedingly difficult, as did the nature of military operations. But the maintenance of health also depended greatly on high morale and strong leadership. In the Russian army, the collapse of effective leadership contributed to the lapse of sanitary precautions and thus to high levels of typhus. As the war turned against the Ottoman Empire, there was a similar collapse in morale and discipline, allowing diseases such as typhus and cholera to sweep through the army. Up until 1916, the Turkish army appears to have paid almost as much attention to sanitary matters as the British, although the record of the British was quite poor in theatres such as Gallipoli and Mesopotamia. At first, senior commanders showed little interest in either sanitary or medical matters, and it was only after these commanders had been removed that conditions began to improve.

Patient being loaded onto an air ambulance, Second World War.
Wellcome Library, London.

On the curative side, military medicine between 1914 and 1918 benefited from scientific innovations such as anti-tetanus serum, which, despite its limitations, helped to control wound infections. Military doctors also became more adept at preventing infection through radical excision of damaged tissues, reversing the trend towards conservative surgery over the previous two decades. But, as Nightingale and others realised during the Crimean War, the most important element in wartime medical care was administration—something to which most armed forces now gave a great deal of attention. Arrangements for evacuation and treatment of the wounded on the Western Front resembled a vast factory that processed the human wreckage of war. Motor ambulances, trains and barges traversed France and Belgium, transporting thousands of casualties from the regimental aid posts at the front to hospitals at the base or at home. Perhaps the most vital link in this chain was the casualty-clearing station, which sorted casualties according to their seriousness and which undertook preliminary treatments and surgical operations. Like other hospitals further down the line, these institutions became increasingly specialised and began to be run in a manner resembling a business, with the application of time-and-motion studies to maximise efficiency.

Outside the Western Front, conditions were more variable. The exclusion of medical officers from operational planning in theatres like Mesopotamia and Gallipoli led to serious problems in medical evacuation by land and sea. These problems were aggravated by a severe shortage of hospital barges and ships, which often resulted in troops being transported long distances in unsuitable vessels, such as those normally used to carry cattle. Another interesting difference between medical arrangements on theWestern Front and other theatres is the comparative absence of facilities for the treatment of nervous disorders (shellshock). By 1916, there were many units on the Western Front to treat these casualties. But outside Europe there were very few and those that were established came late in the war. The reasons for this have yet to be satisfactorily explained. It may be that the huge burden of disease in these theatres masked the true incidence



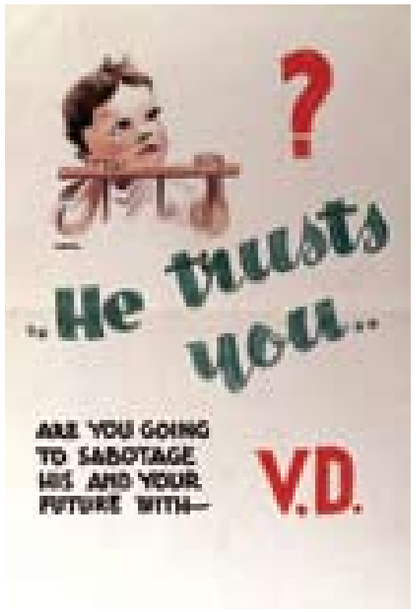
Sinking of the hospital ship Rewa, 1918.
Wellcome Library, London.

of mental disorders. Or it may be that the mobile warfare characteristic of these fronts was less conducive to the production of shellshock cases than trench warfare. Nevertheless, it was increasingly recognised that the many thousands of men who became ill with malaria in these theatres often suffered prolonged mental disturbances. The true scale of the problem and the fate of such patients remains one of the great untold medical stories of the war.

Notwithstanding the problems experienced in medical evacuation and disease-prevention outside the Western Front, the First World War represents an important turning point in the history of war and medicine. It was the first major conflict in which deaths from disease were lower than deaths due to battle injuries, for all combatant nations with the possible exception of Russia and Turkey. In part, this was due to the enhanced killing power of modern weapons—especially high-explosive shells—but it was also a testament to the massive effort made by most military commanders and their political masters to conserve manpower and maintain the morale of servicemen and their families.

By the Second World War, most governments had taken the positive and negative lessons of the First World War to heart. In nearly all theatres of the war and on all sides, a huge effort was made to keep disease to manageable levels and to evacuate casualties as soon as possible. As was the case between 1914 and 1918, armies tried to treat casualties close to the fighting, so that they could be returned quickly to duty (and also to deter malingering). However, the advent of air evacuation opened up new possibilities. In North Africa, Italy, in Western Europe from 1944, and even in the jungles of Burma and the Far East, aircraft were increasingly used to evacuate casualties from places relatively close to the front. This enabled men to receive medical care far more quickly than before and in larger and better-equipped hospitals, which massively improved their recovery rates. Later on, in the Korean War (1950–1953) and Vietnam War (1956–1975), the extensive use of helicopters would render this kind of evacuation the norm.

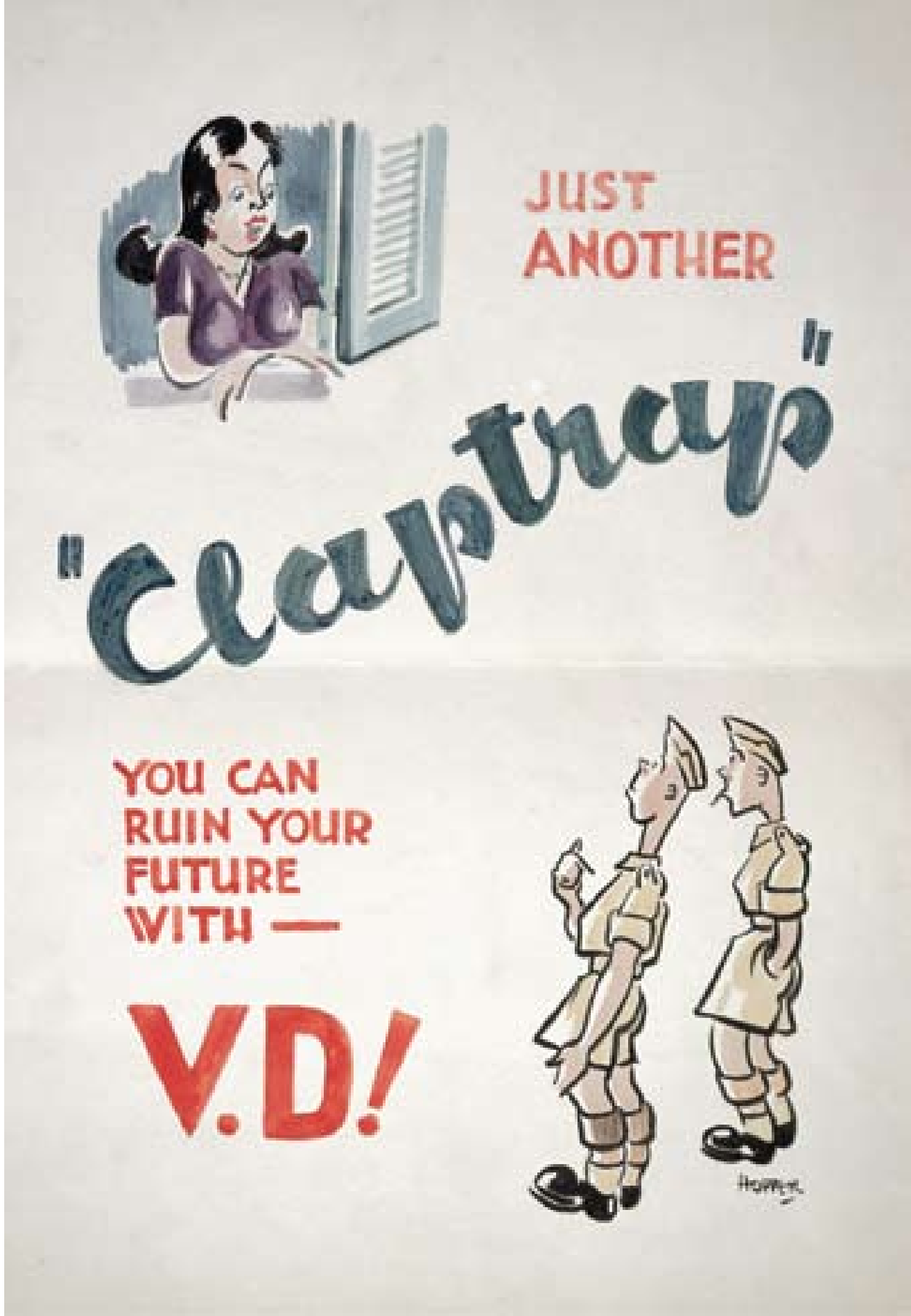
Military doctors in the Second World War also benefited from a number of scientific advances that permitted the



Anti-VD posters, signed "Hooper", 1943–1944. Wellcome Library, London.

more effective treatment of a range of diseases and wound infections. The most famous of these was penicillin, which became widely available in 1944 after extensive clinical trials among soldiers in North Africa. Penicillin not only treated wound infections, but also those that developed after severe burns, which were more frequent between 1939 and 1945 than in previous conflicts due to the large number of motor vehicles and aircraft used. Penicillin also enabled one of the most ubiquitous and difficult military disease problems to be dealt with effectively for the first time. Sexually transmitted infections had always been an enormous problem in wartime, but hitherto, military authorities had been forced to rely chiefly on preventative measures such as medical inspections of brothels and chemical disinfection, knowing that appeals to abstinence were unlikely to be effective. None of these measures worked, however, and the STI rate in theatres such as Italy rose inexorably. Penicillin thus prevented an epidemic of sexually transmitted diseases from becoming a heavy drain on the Allied armies.

The Axis forces did not have the benefit of penicillin, and one only had to look at the abject condition of sick and wounded men captured by the Allies at the end of the war to see the difference it made. The inmates of German hospitals captured between 1944 and 1945 were often suffering from severe wound infections, and the majority responded well when given penicillin. Apart from penicillin, perhaps the most important scientific innovation during the Second World War—from a medical point of view—was the development of the chemical insecticide DDT. DDT was first used by the Allies in the winter of 1943 / 1944 to control an epidemic of typhus among civilians in Naples. So successful was it in arresting the disease that it was soon applied to the prevention of another stubborn infection—malaria, which was a tremendous drain on manpower in several theatres. Despite the general availability of synthetic anti-malaria drugs, by 1944 there had been no real improvement in the malaria situation in Italy, and spraying with DDT commenced as troops moved into areas that abounded with mosquitoes. The effects were dramatic, and DDT was shown to reduce the population of malaria-bearing mosquitoes for some time after spraying.



The same methods—together with a more concerted use of anti-malaria drugs—protected the Allied armies in other theatres such as Burma and the Far East.

It was said that DDT gave the Allies a crucial edge over their opponents in theatres such as Burma. Whether or not it did remains unclear, but it is certain that without DDT and strict anti-malaria discipline, the Allied offensives in the Pacific and Burma would have been far more costly and protracted. But there was one theatre of the war in which sanitary arrangements do appear to have given the Allies an important advantage. In the Western Desert of Egypt, in the run-up to the crucial battle of El Alamein (1942), the British-led force under Montgomery had a sickness rate less than half that of Rommel's Afrika Korps. On the eve of the battle, one in five German troops was out of action due to disease. Remarkably, the Afrika Korps took little interest in sanitation, whereas the British force went to great lengths to avoid disease with diligent attention to sanitation and a deluge of leaflets and lectures on disease-prevention.The wartime experiences of soldiers, airmen and sailors in most combatant armies were probably such as to imbue them with a lasting respect for the benefits of good hygiene. During the two world wars, most European and American troops were bombarded with sanitary propaganda and had personal cleanliness literally drilled into them. Many recorded their experiences of this in diaries and letters, and more than a few admitted that they had changed their behaviour because of it, becoming less tolerant of dirt around the house and of lax hygiene in restaurants, lavatories and other public places. But the true importance of the wars in changing public behaviour has yet to be fully explored. So, too, has the relationship between military medicine and its civilian counterpart. We know that military metaphors and forms of organisation were a prominent feature of civilian medicine and nursing following the two world wars, but it remains unclear how far military experience was directly applied in civilian institutions.

We are probably still living with the legacy of the world wars, but the sense of social solidarity that underpinned medicine in wartime has

French anti-malaria cartoon, First World War. Wellcome Library, London.

largely disappeared. Former generations may have grown to expect more from the state in relation to healthcare in wartime, but they also had a clear view of their responsibilities to each other and to the state. Governments have not given up on health campaigns—far from it—but the sense of civic duty that made such appeals effective is much weaker than it was. Weaker, too, is the commitment of some—though by no means all—states to the health of their servicemen and women. Whereas it was formerly taken for granted that servicemen would receive care in specialist hospitals, where their privacy and dignity would be respected, this is sadly no longer the case. In Britain, the majority of those wounded in Afghanistan and Iraq are treated in civilian hospitals and sometimes in civilian wards. Service personnel have complained that these arrangements leave them open to abuse from civilians opposed to recent conflicts in Iraq and Afghanistan. There have also been several instances of hospital-acquired infection, which some soldiers have attributed to low standards of hygiene in civilian hospitals. Whether or not such claims are justified, the loss of separate facilities for military patients has led many to ask whether the 'military covenant', whereby the state looks after its wounded servicemen, has disappeared.

An Angel of Mercy Florence Nightingale with lamp, visiting the sick. Coloured mezzotint, by Tomkins after Butterworth, 1855. Wellcome Library, London.

THE IMPACT OF THE CRIMEAN WAR ON PUBLIC HEALTH

Hugh Small

The Crimean War (1854–1856) provides an outstanding example of wartime experience informing domestic medicine, specifically preventative medicine. The process was paradoxical: the failure of the military authorities to adopt the latest practices allowed their value to be demonstrated to sections of the civilian medical profession and the public, which had not yet been convinced.

For two years after the end of the war, a controversy over the cause of the high wartime mortality from sickness pitted reforming disciples of the sanitarian Edwin Chadwick against the conservative army medical staff. Florence Nightingale became the figurehead for the reformers; her surviving letters, together with pamphlets and statistics from both sides, show how the battle for the hearts and minds of the public was fought.

Nightingale presented her statistics by deploying her famous 'Coxcomb' diagrams, in official reports and in a book that she commissioned from a popular author, believing that colourful graphics with simple messages would carry more weight than dry figures and logical reasoning. Her overriding objective was to ensure that the lessons of the war should be applied to the civilian population at home, where the mortality from preventable disease was staggeringly high. In her final pamphlet of the controversy, published exactly 150 years ago, she clarified that her main target was civilian public health: "Let us now ask, how was it that our noble army all but perished in the East? And we shall at the same time learn how it has happened that so many hundreds of millions of the human race have by pestilence perished before their time."

THE HUMAN COST OF THE WAR

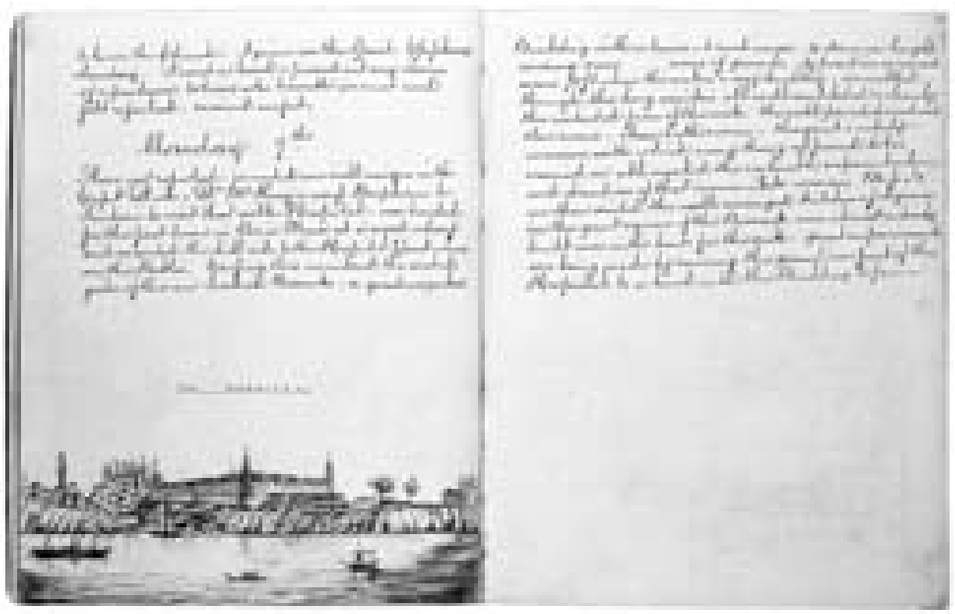
Britain and France declared war on Russia in March 1854, after the latter had invaded the European provinces of the Turkish Empire (now Moldavia and Romania). In September of the same year, the Allies invaded Russia's Crimean peninsula with the objective of destroying the Russian naval base and arsenal at Sebastopol. After a siege lasting a year, the

Above: Barrack Hospital, Scutari, 1845–1855.
Wellcome Library, London.

Right: Cutting from *The Illustrated Times*, with a picture of Florence Nightingale, 27 February 1856.
Wellcome Library, London.

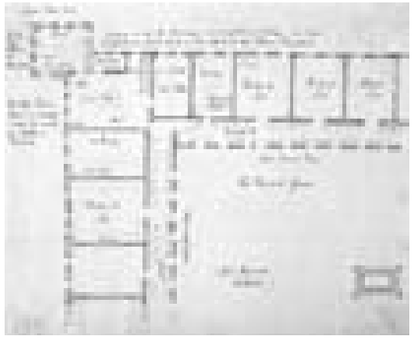
Allies destroyed the naval installations, and peace was restored in April 1856. The British army in the region numbered fewer than 60,000 men at its peak, but nearly 21,000 British soldiers perished in the war. Only about 4,500 died as a direct result of injuries; the rest were victims of disease, having been admitted to regimental or general hospitals suffering principally from scurvy, exposure, dysentery, cholera, typhus and malnutrition. The mortality was particularly high in the first winter: in the single month of January 1855, two months after Florence Nightingale arrived at the Barrack Hospital, Scutari (near Istanbul), ten per cent of the whole British Army in the East died of disease. The army had decided to spend the winter besieging Sebastopol without proper preparation, and the conditions were worse for the besiegers than for the besieged. Many of the sick were evacuated by sea to the general hospitals at or near Scutari, 500 kilometres from the front line. Some died during the arduous journey, but the evacuation was thought necessary because the army was in a precarious situation and might have had to withdraw from the Crimea at any moment.

The arrangements for treatment of the sick and wounded came in for much criticism in newspaper reports from the war zone. Ambulances, drugs and hospital equipment were in short supply, and Nightingale was credited with introducing improvements when she went to Scutari two months after the invasion of the Crimea.



Above: AB Barton, Journal of a ship's medical officer at the time of the Crimean War. Drawing showing Scutari Barrack Hospital, 1855.

Right: Plan of Scutari Barrack Hospital, 1855.
Wellcome Library, London.



At the end of the first winter, the army in the Crimea became more secure and better supplied. Hutted hospitals opened near the front line and a smaller proportion of patients were sent to Scutari. The death rate among soldiers admitted to hospital declined. However, as the fighting intensified, the size of the army increased and deaths from sickness remained high in absolute terms.

POLITICS AND THE SANITARY COMMISSION

Political changes at home in Britain may have contributed to the improvement of the health of the army after the winter of 1854–1855. In February 1855, the conservative-led coalition government was forced to resign as a result of its mismanagement of the war; its replacement, a more liberal government headed by Lord Palmerston, was determined to introduce civilian standards of administration into the army. Palmerston's first act as Prime Minister was to send a civilian Sanitary Commission with specific instructions to improve sewers, water supply and ventilation in camps and hospitals at Scutari and in the Crimea. The previous government had been much less interested in these matters: over Palmerston's protests, it had sacked the sanitary reformer Edwin Chadwick and abolished his General Board of Health in deference to landowners who resented the extra taxes and building regulations that his sanitary reforms entailed.

The leader of Palmerston's Crimean Sanitary Commission was Dr John Sutherland, who had formerly worked for the defunct General Board of Health. Arriving in the east in March 1855, Sutherland found the hospital at Scutari to be as filthy as the vilest slums in London.

Drawing of the Barrack Hospital, Scutari, 1854–1855.
Wellcome Library, London.

He and his colleagues (who included an engineer) employed workmen to remove the ordure and to improve ventilation, sewers and water supply. They broke 400 glass panes in the Scutari hospital on the first day to let in fresh air, the windows having been sealed to conserve heat. Any opposition from the senior army officer in charge could have been silenced by showing him the new Prime Minister's personal instructions to ventilate this building. Some people at home had evidently been aware of the problems at Scutari for some time.

POST MORTEM AND THE ROYAL COMMISSION OF ENQUIRY

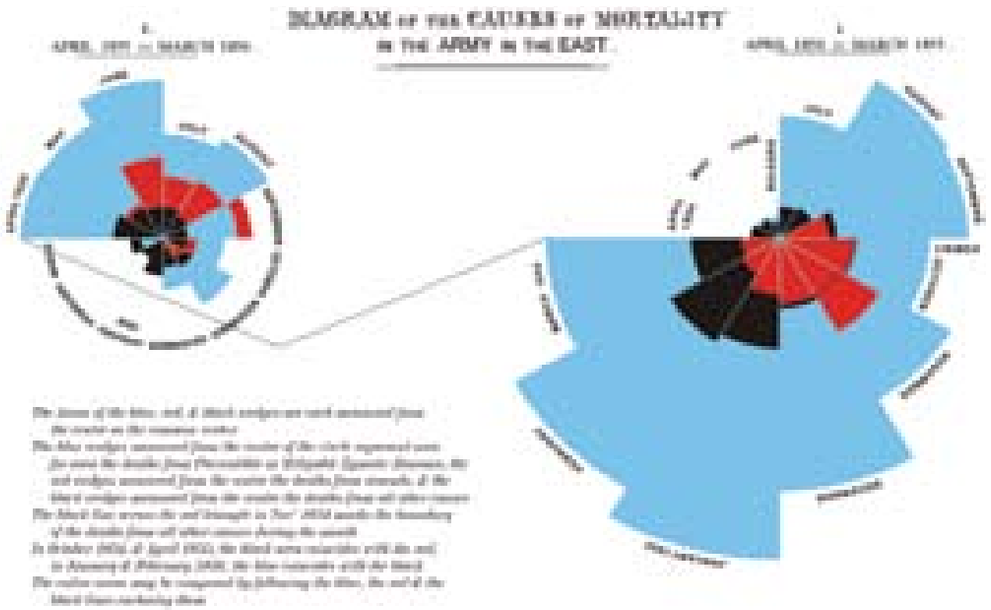
After the war ended, some progressive elements close to the Government wanted a Royal Commission of Enquiry to report in public on the defects in the army's medical services and to put forward suggestions on correcting them. Nightingale was the champion of those reformers in the army and in government who favoured this public enquiry, fearing that the army was incapable of reforming unless exposed to public censure. Nightingale's position was an unusual one. During the war, she had been a functionary of the state, reporting to a senior officer in the Army Medical Department. Her published job description involved superintending female nurses and distributing gifts donated by the public. The role of public servant was rare, if not unique, for a woman at that time—most female reformers acted in the name of private charities. Even more unusual was her confidential job description: she was to report direct to the Cabinet on any defects in the army hospitals. Her qualifications for this were that she had been superintendent of a hospital in London for nearly a year and had studied hospital organisation in France, Italy, Germany and Egypt. Now, after the war, the government wanted her to use her influence with Queen Victoria and with the public to overcome army resistance to the public enquiry. Nightingale had written to the Queen during the war asking her to set up civilian post offices in the Crimea, so that soldiers could send money home instead of spending it on drink. The scheme had worked brilliantly: the Queen was most impressed, and invited Nightingale to

Drawing of Florence Nightingale, in the Barrack Hospital, Scutari, 1855.
Wellcome Library, London.

Balmoral after the war. Nightingale used the opportunity to lobby the Queen for the Royal Commission, and also helped to draft the terms of reference for it as well as nominating several of the Commissioners.

Lord Palmerston, not sure of whether he could obtain authorisation for the Royal Commission, also asked Nightingale to prepare a confidential report to the Cabinet as a fallback. To compile her report, she began to collect the mortality statistics of the army, and this brought her into contact with William Farr, a physician and statistical epidemiologist (as we would call it now) employed at the General Registry Office in Somerset House. Farr was a physician whose career had been kept back by his humble background and by his focus on the unpopular subject of hygiene. Farr had long been interested in the mortality of the army, which he regarded as a controlled environment for studying the health of the working man. Earlier studies in this area had convinced him that hospital hygiene, rather than quality of medical care, was the most important factor influencing the mortality of patients.

Nightingale first met Farr in November 1856, and worked with him to analyse the mortality data. She had insisted, against her parents' advice, on studying mathematics under a tutor in her youth, and Farr now coached her in statistics. By March the following year, their studies had led them to the conclusion that the principal cause of death during the war had been poor hygiene in the army hospitals. When the Royal Commission of enquiry was finally authorised, with Dr Sutherland as one of the Commissioners, Nightingale decided to make this discovery the central message of the Commission's public report. This shifted the blame from the army to the Cabinet Ministers who had approved the hospital buildings without evaluating the sanitation—the same Ministers who had abolished the General Board of Health to save money on public sanitation in Britain. It would make the Commission's findings much more relevant to the civilian population than if they had been simply a series of recommendations about army medical organisation. It seems likely that Nightingale took this course because she was influenced by Farr's belief that public hygiene was being neglected and



Florence Nightingale's 'Coxcomb' diagram: 'Causes of Mortality in the Army in the East'. Wellcome Library, London.

that armies were a good testing ground for measures to protect the civilian working population.

Having decided to make hospital hygiene her main culprit, Nightingale pursued her goal single-mindedly and with an imaginative use of statistics supported by innovative graphics. When the Royal Commission Report was published in early 1858, its most striking section was an appendix containing her graphical representations of statistics, a sort of Victorian PowerPoint presentation, which she called the 'Coxcomb'—meaning the gaudy part of the report that would catch people's attention. Her principal evidence was the data that showed that the death rate from sickness decreased dramatically after Dr Sutherland's Sanitary Commission had begun its work. Conveniently, this occurred exactly half way through the two-year war, enabling her to construct a two-part diagram contrasting two periods of twelve months each. The diagram above (now usually referred to as the Coxcomb) is a revised version, published late in 1858. The mortality in each of 24 months is proportional to the coloured areas; the months are shown turning clockwise, with the first 12 months of the war in the figure on the right. The blue areas represent the mortality from preventable disease, the red areas from wounds, and the grey from other causes.

This chart does not conform to the modern convention that time series data should be presented as a column chart on a horizontal time axis. By dividing the chart into two halves and grouping each half into a circle, Nightingale has added an extra dimension to emphasise the 'before and after' of the Sanitary Commission, downplaying the month-on-month variation. It is an effective communication tool that emphasises a single key message: that the Sanitary Commission saved lives.

The Royal Commission not only examined the mortality of the army in the war zone, but also that of soldiers in their barracks at home, where they found that soldiers in peacetime had a much shorter life expectancy than civilians (whereas they should have lived longer because the army rejected unhealthy candidates). This, the Commission's experts said (briefed by Nightingale,

Florence Nightingale's 'Lines Representing the Relative Mortality of the Army at Home and of the English Male Population at Corresponding Ages'. Wellcome Library, London.

who coordinated the enquiry), was due to their barracks being even more unhygienic than civilian homes of the period. Nightingale illustrated this with the chart above.

The chart is a kind of visual elegy for the soldiers who were being killed every day in peacetime by bad hygiene rather than by bullets. The poet AH Clough, author of *Say Not the Struggle Naught Availeth*, was acting as Nightingale's secretary at the time she produced this chart, and the poetic features might lead one to suspect that he influenced it. First, the title 'Lines ...' makes it sound like a poem, as in *Lines on the Death of Bismarck*. Secondly, four pairs of bars are presented, when actually the message would have been clear from one pair alone. This repetition, is reminiscent of a chorus. The poetic effect is increased by the words, repeated at the end of each line, "English Men, English Soldiers ..." like the march played on a solitary kettledrum at a military funeral.

On an emotional level, the red bar representing the soldiers would certainly have made some people think proudly of the 'Thin Red Line', a phrase that had become famous in the Crimean War when a two-deep row of red-jacketed British infantrymen had stopped a Russian heavy cavalry charge, something that was thought to be impossible. The thin red lines on Nightingale's chart represented these same heroic soldiers, who were now dying unnecessarily because of bad hygiene in their barracks.

This 'Lines' graphic was probably the most influential of Nightingale's diagrams because it dealt with a situation that was still going on. She sent framed copies of some of her charts to the War Office, and it can be assumed that this was one of them. An editorial in *The Lancet* described this finding of the Royal Commission as "surprising and grave".

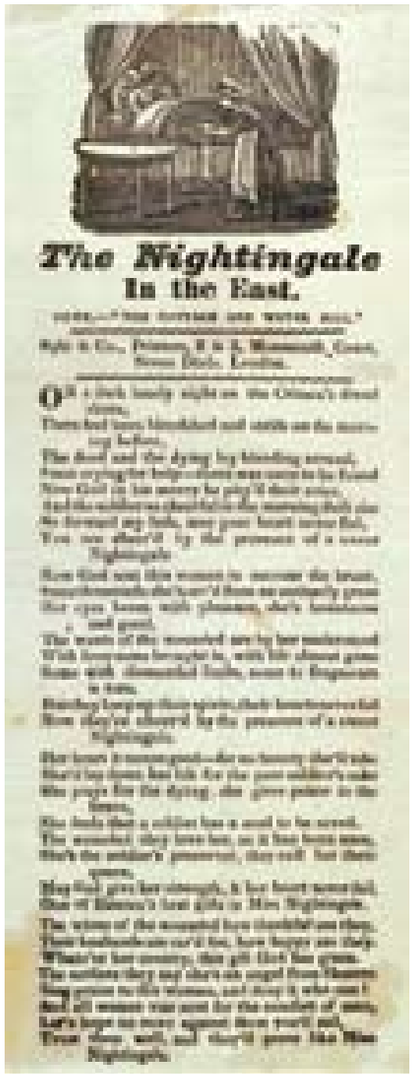
Nightingale is sometimes given credit for inventing statistical diagrams. While this is incorrect, she probably does deserve the credit for being the first to use them *prescriptively*, as part of a call to action, rather than just *descriptively*. Her charts illustrate a cause and its effect, or what she called a 'law'.

Page from *The story of Florence Nightingale: the heroine of the Crimea*, W J Wintle, 1895.
Wellcome Library, London.

THE CONTROVERSY

Dr Sutherland had published his own report into the proceedings of his Crimean Sanitary Commission a year before the Royal Commission report claimed that he had reduced the death rate. His report had immediately provoked angry responses from the army's senior medical officers, who felt criticised by his detailed descriptions of the filthy state of the Scutari hospital and the camps.

The prevailing opinion among the medical staff was that the high



Left: Cutting, "The Nightingale in the East", 1855.
Wellcome Library, London.

Right: Portrait of J Hall, halftone reproduction, by SM Mitra, 1911.
Wellcome Library, London.

mortality in the Crimean War was due to the failure of the army and the commissariat to provide adequate rations, shelter and rest for the men. They had been starved, frozen and worked to death by uncaring senior officers, so the theory went, too weak when they arrived at hospital to respond to any treatment then available. Sir John Hall, Principal Medical Officer in the Crimea and Nightingale's old antagonist, published two pamphlets criticising Dr Sutherland's report and putting forward these and other alternative explanations. Hall claimed that the fall in mortality after the first winter was due to many changes, principally the better weather and better supplies. He may have been partially right, as even Dr Sutherland admitted. But Hall compromised his arguments somewhat by saying that he had previously made the same sanitary recommendations that Sutherland had made, though he did not have Sutherland's power to carry them into effect. This made it appear as if Hall's quarrel with Sutherland was motivated by a desire to defend his record rather than to pursue the truth, in contrast to Nightingale's remarks in the Royal Commission Report, which did not try to defend her hospital against charges of particularly poor sanitation.

Dr Sutherland replied to Hall with pamphlets of his own, in which he argued that there was no record of Hall having made sanitary recommendations. Hall's unconvincing response was that he had made them verbally, which Sutherland countered by showing that Hall and his colleagues had written reports admitting that the Scutari Hospital was "crowded and polluted"

but offering no solution except to evacuate the patients to England. From this exchange it seems quite probable that the medical authorities in the Crimea were not well versed in the emerging science of building sanitation. In this they were no different from many civilian medical men.

When the Royal Commission's report appeared, a year after Sutherland's, another pamphlet appeared, which criticised the Royal Commission's findings and repeated Hall's arguments about Crimean mortality. The pamphlet was anonymous, but Nightingale believed that it was the work of Hall and his colleagues. It also criticised Nightingale's new finding that soldiers in peacetime had a lower life expectancy than civilians and her conclusion that this was due to poor sanitation in the barracks. Among other evidence, it cited with approval the "careful researches" of Dr Greenhow, who had claimed in a recent government report that improving the homes of the poor did not improve their life expectancy. To Nightingale, this was like a red rag to a bull, because it promoted the anti-sanitarian views of the Conservative government that had recently taken over from Lord Palmerston. The argument of some medical men like Dr Greenhow was that scarlet fever (one of the major causes of premature death) was transmitted directly from person to person, not through a contaminated environment, and that therefore the mortality from it could not be reduced by sanitarian measures. Nightingale's argument was that the disease was more likely to be fatal when sanitation was poor.

She produced her own pamphlet—*A Contribution to the Sanitary History of the British Army*—in which she linked military and civilian ignorance of sanitation:

> The recently published Correspondence of the Army Medical Officers during the Russian War shows how very small a number of these Officers was acquainted with the elements of [sanitation]. In the present (so-called) enlightened time, sound principles of Hygiene are by no means widely spread among the civilian medical profession.

This pamphlet also included the improved diagram shown on page 34, Nightingale paid for the popular

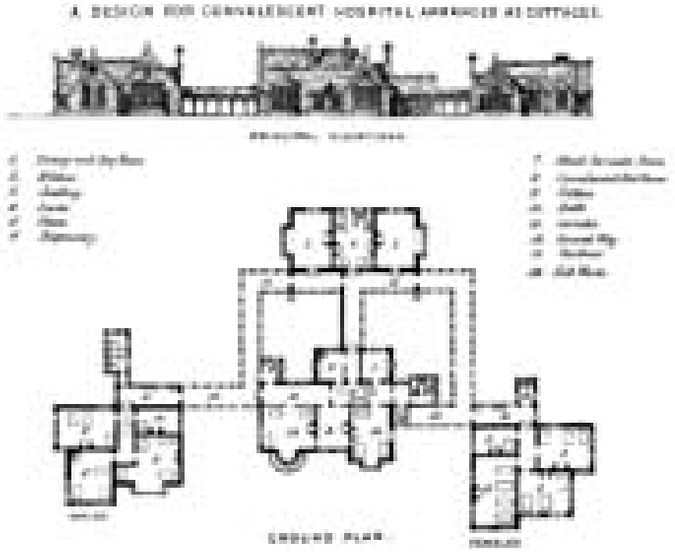
Florence Nightingale and her brother-in-law Sir H Verney with nurses at Claydon House, Buckinghamshire. Wellcome Library, London.

journalist Harriet Martineau to write *England and her Soldiers*, an accessible version of the Royal Commission report.

She paid for copies of this book, which also contained the famous diagram, to be distributed to mechanics' institutes throughout the country. Finally she distributed (leaked, one might say) copies of the confidential report that Lord Palmerston had requested to at least a hundred of the leading public figures in the country. This contained some surprising new data: a table of regimental statistics that showed that the death rate in each regiment was proportional to the number of patients it sent to Scutari. No explanation was given of how this new data was obtained so long after the war, but if accurate, it would be a much more convincing proof that hospital conditions, particularly at Scutari, caused the high death rate. After this, the public debate on the causes of wartime mortality effectively ceased.

CIVILIAN FALLOUT

The transfer of experience from the Crimean War to civilian preventative



Left: Florence Nightingale's design for a convalescent hospital arranged as cottages, from *Notes on Hospitals*, 1863. Wellcome Library, London.

Right: Title page of *England and Her Soldiers* by Harriet Martineau, 1859. Author's collection.

medicine largely resulted from the government's extraordinary decisions first to send Nightingale to the war and then to ask her to orchestrate a public enquiry into the Army Medical Department. As a result of her experiences, she was able to lend her fame and her energy to the sanitarian movement that had stalled with the dismissal of Edwin Chadwick. This occupied much more of her time during the15 years after the war than did her previous interest in hospital nursing. Hers was not the only sanitarian initiative of the time; for example, she seems to have had little to do with the boom in sewer construction initiated as a result of the Great Stink of 1858. The metropolitan sewers were a megaproject, but Nightingale's speciality was bringing the sanitary lessons of the Crimean War to the population at large through village committees, popular books (including her *Notes on Nursing*, a self-help manual for housewives), home nursing visits and other grass-roots initiatives that are nowadays credited with creating a revolution in hygiene standards.

She made a significant contribution to larger projects, too, through her pre-eminent role in hospital design and construction. Her 1863 *Notes on Hospitals* became a standard text for hospital designers, and she was personally involved in advising on the building of many hospitals in Britain and overseas: St. Thomas's, Gilbert Scott's Leeds Infirmary, and the Royal Buckinghamshire Hospital are three that survive as hospitals. Her favoured "pavilion plan" was a radical departure from the monumental hospital style previously in favour, and her ideas were inspired by the shortcomings of the Scutari Barrack Hospital.

It would be hard to quantify the impact of the lessons learned in the Crimean War in terms of improvement in civilian health. It is clear that life expectancy in Britain increased from 39 years at the end of the war to 55 at the time of Nightingale's death in 1910, one of the steepest rises in recorded history. There is evidence that this increase owed little to curative medical techniques, vaccination, improved human immune systems, or a decrease in the virulence of microbes. There is not much agreement on what did cause the increase, the two chief candidates being improved nutrition and better sanitation. Nightingale's efforts

The statue of Florence Nightingale in Waterloo Place, Westminster, with a veteran of the Crimean War and children. Drawing by John Byam Shaw. Wellcome Library, London.

did not constitute the entire sanitarian movement, but she was without doubt an articulate public figurehead who emerged at the critical moment in 1858, when Chadwick's engineering-led approach to public health had been replaced for political reasons by one that focused on medical research. Within a short time, the sanitarian movement was not only back on the government-policy agenda, but was also embedded in the popular culture. Whether or not her statistical conclusions can be validated, Nightingale's lessons from the war, which she so effectively presented to a wide audience at all levels of society, must share the credit for facilitating this revolution.

SISTER M ALOYSIUS DOYLE

THE CRIMEAN JOURNALS OF THE SISTERS OF MERCY, 1854–1856

Sister M Aloysius Doyle and the Sisters of Mercy were sent on a mission to the East during the Crimean War, assisting Florence Nightingale at the General Hospital, Scutari, from 1854–1856.

My first day in the wards of the General Hospital, Scutari. Where shall I begin, or how can I ever describe my first view? Vessels were after arriving and the orderlies carrying the poor fellows, who had, with wounds and frostbite, been tossing about on the Black Sea for two or three days, and sometimes more. Where are they to go? Not an available bed. They are laid on the floor one after another, till the beds are emptied of those who are dying of cholera and every other disease. Many died immediately after being brought in, their moans would pierce the heart. The taking of them in and out of the vessels must have increased their suffering very much.

The look of agony in those poor dying faces will never leave my heart. They may well be called the 'martyrs of the Crimea'. We went round with hot wine, and relieved them in every way as far as it was possible for us to do so. We went to the Catholic soldiers, took the names of those in immediate danger, that the chaplain might go to them at once. He was there; but it hastened matters for him to get the list of worst cases. The beds were by degrees getting empty. If stretchers were bringing in some from the vessels, others were going out with the dead. By degrees we were able to get them to bed. Then, of course, we could see after them better.

I will try to describe the cholera first and then the frostbite, these latter the worst of all. The cholera was of the very worst type, and when once attacked, the patients only lasted four or five hours. Oh, those dreadful cramps; you might as well try to bend a piece of iron as to move the joints when once attacked. I believe the medical staff did their best, and I may say daily, hourly risked their own lives, and with little or no success. At last everyone seemed to be getting paralysed. The orderlies indifferent as to life or death.

The usual remedies ordered by the doctors were stuping, poultices of mustard, etc.[1] They were very anxious to try chloroform, but they did not trust anyone with it except the Sisters. Reverend Mother was a splendid nurse, and had the most perfect way of doing everything. For instance, the stuping seems such a small thing, and if not properly done it does more harm than good. I will give her way. A large tub of boiling water, blankets torn in squares, a piece of canvas with a running at each end to hold a stick.

The blankets put into the boiling water lifted out with a tongs and put onto the canvas, an orderly at each end, they wring the flannel out so that not a drop of water remains. A preparation of chloroform sprinkled on and applied to the stomach; a spoonful of brandy, and immediately after a small piece of ice, to try to settle the stomach, but very seldom it succeeded: rubbing with mustard and even with turpentine, but cholera is proof against all. Rarely, very rarely, anyone got over it, and, as a rule, it was not the weak or delicate who were attacked by this deadly disease, but the strong and healthy, if there was any such out there. One day a fine young fellow, the picture of health and strength, was carried in on a stretcher to my ward. I said to the orderlies, "I hope we will be able to bring him through". I set to work with the usual remedies; but the doctor shook his head, and said, "I'm afraid it's all no use, Sister, he won't do". When the orderlies, poor fellows, were tired I set to work myself, and kept it on till nearly the end, but you might as well rub iron; no heat, no move[ment] from his joints. He only lived about the usual time, four or five hours ....

We beg of the orderlies, who are waiting to take them to the dead house, to wait a little lest they may not be dead; and with great difficulty we can prevail on them to make the least delay. As a rule, the orderlies drink freely, when they can get it, to drown grief, they say. I must say their position is a very hard one. Their work is increasing and such work, death around them on every side, their own lives in continual danger; it is almost for them a continuation of the field of battle.

When the poor wounded men are brought in out of the vessels they are in a dreadful state of dirt; and they are so weak that whatever cleaning they get must be done so cautiously. Oh, the state of those fine fellows, so worn out with fatigue, so full of vermin from the soiled clothing and poverty of blood. The doctors gave us a wash, which we found very useful. Most, or I may say all of them, required spoon feeding. We had wine, sago, arrowroot.[2] Indeed, I think there was everything in the stores, but it was so hard to get them. We went every morning with the orderlies to get the wine, brandy, and other things ordered by the doctors: we gave them out according to their directions.

The medical officers were kind enough to say they had no one to depend on but the nuns. Sometimes, if allowed, a man might drink the brandy ordered for the day in one draught which, of course, would do him great harm. An orderly officer takes the rounds of the wards every night, to see that all is right. He is expected by the orderlies, and the moment he raises the latch one cries out, “All right, your honour”. Many a time I said “All, all wrong”. The poor officer, of course, went his way; and one could scarcely blame him not to enter these wards, so filled with pestilence, the air so dreadful that to breathe it might cost him his life. And then what could he do even if he did come? I remember one day an officer’s orderly being brought in, a dreadful case of cholera; and so devoted was his master that he came in every half-hour to see him, and stood over him in the bed as if it was only a cold he had. The poor fellow died after a few hours’ illness. I hope his devoted master escaped. I never heard.

It was said that the graves were not made deep enough, and that the very air was putrid. There were no coffins, canvas and blankets had to suffice, though cholera is still pouring in. I must say something of my poor frostbitten patients.

The men who came down from the ‘front’, as they called it, had only blay linen suits, no other clothing to keep out the Crimean frost of 1854–1855. When they were carried in on the famous stretchers, which conveyed so many to their last resting-place, they often had to be laid on the floor, no beds being ready for them. When one was available, their clothes had to be cut off. In most cases the flesh and clothes were frozen together; and, as for the feet, the boots had to be cut off bit by bit, the flesh coming off with them, many pieces of the flesh I have seen remain in the boot. Poultices are applied with some oil brushed over them. In the morning, when these are removed, oh, can I ever forget it? the sinews and bones are laid bare. We had surgical instruments; but in almost every case the doctors or staff surgeons were at hand, and removed the diseased flesh as tenderly as they could. And as for the toes, you could not recognise them as such. Far, far worse and more painful were these than the wounds; and what must it have been when they had both? To my dying day I can never forget the dreadful frostbite.

And then the poor fellows were so prostrate, no matter what care they got they could not survive.

The following is from a letter written by one of the Sisters at this time, dated Scutari:

> A poor frost-bitten soldier told me that when lying ill at Balaclava one night, when he tried to stir his feet, he found them frozen to those of another soldier whose feet were lying against his. Many lose all the toes, many, the whole foot and hundreds have died from this frightful frostbite.

It is a comfort to think that these fine brave men had some care, all that we could procure for them. At this time the food was very bad, goats’ flesh, and something they called mutton, but black, blue, and green. But who could complain of anything after the sufferings I have described and yet, I believe, it is only giving a fair idea of the reality and then the patients: not a murmur ....

One day, after a batch had arrived from the Crimea, after I had taken my rounds through them, one of my orderlies told me that a man wanted to speak one word to me. When I had a little time I went to him. “Tell me at once what you want. I have worst cases to see after”, (he did not appear to be very bad). “All I want to know, Ma’am, is, are you one of our own Sisters of Mercy from Ireland?” “Yes”, I said, “your very own”. “God be praised”, exclaimed the poor man.

Another poor fellow said to me one day, “Do they give you anything good out here?” “Oh, yes”, I said, “Why do you ask me?” “Because, Ma’am, you gave me a piece of chicken for my dinner, and I kept some of it for you”, he pulled it out from under his head and offered it to me. I declined the favour with thanks, I never could say enough of those kind-hearted soldiers and their consideration for us in the midst of their own sufferings.

Originally published in The Crimean Journals of the Sisters of Mercy, Four Courts Press.

HOW VARIED THE IMAGE OF HEART TRAUMA HAS BECOME

THE DEVELOPMENT OF CARDIOVASCULAR SURGERY DURING THE FIRST WORLD WAR

Susanne Hahn

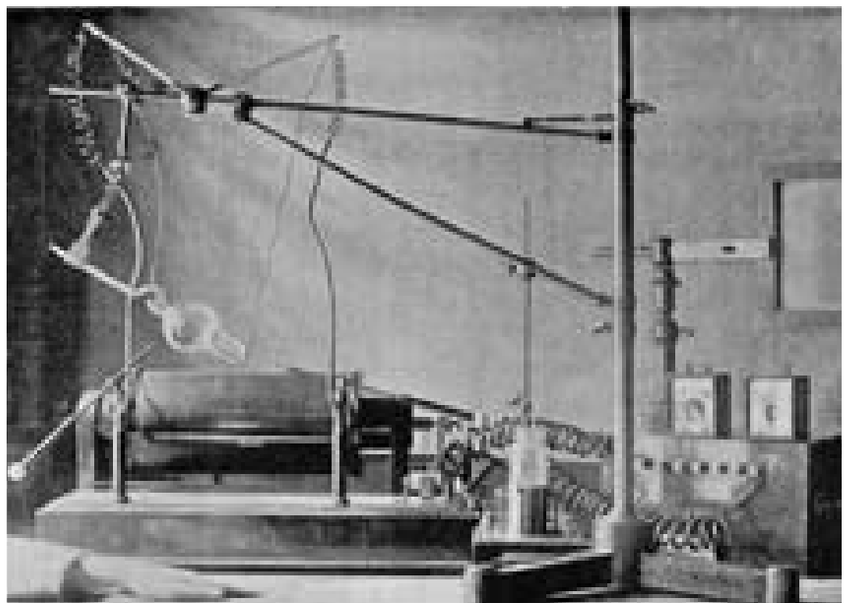
The expression attributed to Heraclitus of Ephesos (c 535–475 BC) that "War is the father of all things" is repeatedly quoted in the history of medicine. It particularly defines the attitude of leading German military doctors during and after the First World War.

Ludwig Rehn (1849–1930) is an example. Professor at the University of Frankfurt and director of the city's municipal hospitals, he had in 1896 successfully made use of cardiac sutures for the first time to treat a patient with a stab wound. This was a breakthrough in cardiac surgery; operating on the heart had previously been considered impossible. During the war, Rehn was promoted to the position of consultant surgeon and Medical Brigadier General of the Landsturm. In 1922, he enthusiastically outlined what the war had represented for him as a heart surgeon:

> In this monstrous war there existed the opportunity as never before to treat heart injuries, to operate and to carry out autopsies … Thereby our knowledge and our proficiency has been greatly advanced … How varied the image of heart trauma has become; how very much larger our understanding! I am reminded … of the diversity of lodged shots that pertain to the pericardium and the heart … It is not only the variety of the injuries to the heart that astonishes us, but time and again the amazing fact of what the human heart is able to endure ... What resilience the heart possesses with respect to these injuries![1]

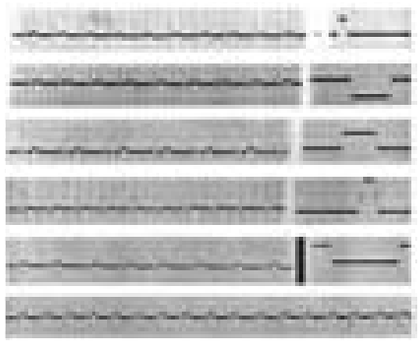
In 1895, the year before Rehn's breakthrough, Wilhelm Conrad Röntgen (1845–1923) had discovered X-rays, which were later to be named after him. The X-ray rapidly developed into the predominant diagnostic method in medicine. It enabled the size and shape of the heart to be determined, in addition to localising foreign bodies. After the war, radiologists agreed that the location of foreign bodies "has developed into an illustrious chapter in radiographic diagnostics directly resulting from the world war 1914–1918".[2]

But these assumptions that the First World War significantly enriched



Above: Complete apparatus for Röntgen Ray work in 1897.
Wellcome Library, London.

Right:
Electrocardiograms of six persons, traced by means of the string galvanometer, 1903.
Wellcome Library, London.



medicine are contradicted by the evidence, particularly in the field of cardiovascular surgery. In fact, war in general, and in particular the First World War, greatly impeded medical developments, since it prevented the medical profession from fulfilling their potential. However, medical developments did play an active part in, and partially determined, the events of the war. They impacted, for example, on the physical examinations carried out to determine fitness for military service, the systematic evaluation of casualties and fallen soldiers by army pathologists, and they even influenced new biological and chemical weapons systems.

On the eve of the First World War, as a result of these and other recent scientific and technical achievements, medicine was equipped as never before to confront the anticipated injuries to the heart and vascular system. In 1896, Willem Einthoven (1860–1927) developed the electrocardiogram with string galvanometer. Together with the insights of Ludwig Aschoff (1866–1942), Sunao Tawara (1873–1952) and Wilhelm His (1831–1904) into the cardiac-conduction system (a group of muscle cells in the heart that cause it to contract) and X-ray imaging, the ECG developed into a subtle method for diagnosing defects in cardiac rhythm and enabled functional statements on cardiac activity. The elaborate and costly equipment was, however, reserved for research facilities and not suitable for widespread use in combat.

It was considerably more straightforward for the non-invasive methods of blood-pressure measuring inaugurated in 1896 by Italian paediatrician Scipione Riva-Rocci (1863–1937) to gain acceptance. Simple cardiac sutures were also developed further. Ferdinand Sauerbruch (1875–1951) and Johann

German wounded at Diakonissenhaus, Frankfurt. Postcard, 8 October 1914.
Courtesy Wolfgang Eckart.

von Mikulicz-Radecki (1850–1905) developed new techniques of cardiac surgery in their use of vacuum chambers for operations on the interior of the chest. This was replaced shortly afterwards by Sauerbruch's innovation of performing artificial respiration with compressed air. Both of these procedures averted the dreaded pneumothorax, the collapse of the lungs following the opening of the chest.

Less spectacular but equally significant were the rapid advances made in vascular surgery, which were closely connected to the introduction of antisepsis by Joseph Lister (1827–1912) and the further development of suture material. Vascular surgery was heavily promoted by the French surgeon and physiologist Alexis Carrel (1873–1944). Active at the Rockefeller Institute for Medical Research in New York from 1906 onwards, he succeeded in performing experimental transplants of animal tissue and organs and specifically vascular transplants. He perfected the vascular suture technique and introduced cryopreservation for vascular grafts. In 1912, he was awarded the Nobel Prize in recognition of his work.

In Germany, too, there were vascular surgeons at work, such as Ernst Jeger (1884–1916), who performed a successful animal bypass operation in 1913, and Friedrich Trendelenburg (1844–1924). In 1907, Trendelenburg carried out the operation on a pulmonary embolism that was named after him. In experiments on animals he exposed the heart and, by means of a suction syringe introduced into the pulmonary artery, he removed the fatal blood clot.

Thus by the start of the First World War, the prerequisites for the treatment of aneurysms (ballooning) of the vascular wall and transplant operations were available. Research was also being conducted into cardiopulmonary resuscitation, for which new possibilities had arisen as a result of developments in cardiovascular surgery.

Technological advances in weaponry that had been made with the respect to the wars waged at the end of the nineteenth century would also have a bearing on cardiovascular surgery. In addition to the development of biological and chemical weapons, small-bore arms with pointed bullets were evolving.

Above: "With God for Emperor and Fatherland/Hurrah, hurrah! I went into the battle, one bullet found me, but it was for Emperor and Reich". Postcard, 12 October 1914.
Courtesy Wolfgang Eckart.

Right: Willem Einthoven (1860–1927), Photograph by Charles R Messelhoff, 1930.
Wellcome Library, London.

As early as 1828, elongated bullets had superseded spherical amunition in France. These were improved during the course of the century, until in 1898 round-headed bullets were replaced by pointed versions, which were better suited to the new low-smoke nitrate powder. The pre-eminence of these pointed bullets became clear for the first time in 1904–1905 during the Russo-Japanese War, when the Japanese, equipped with these bullets, defeated the Russian army, who were still firing with round-headed amunition. By around 1910, all large armies had converted to pointed bullets. From a military perspective, these were considered extraordinarily effective due to their low resistance, their good range and flat trajectory. Because of their relatively low traumatic impact, they were described by military surgeons as "humane". If they hit the heart or brain they no longer spelt the certain death of the soldier but offered a chance of survival. The bullets were intended to render the enemy unfit to fight, but not necessarily to kill.

Cardiovascular surgeons at this time had a range of suitable therapeutic interventions at the ready to treat the anticipated injuries from pointed bullets. These wounds included a variety of trauma to the pericardium, shot-graze injuries, bullets in the pericardial cavity or lodged in the pericardium and in the wall of the heart, shots through one or more cardiac chambers, pericardial or

Above: Wounded Germans arriving at Lake Konstanz after internment in Switzerland, March 1915, in E Nagel, *Die Liebestätigkeit der Schweiz im Weltkriege*, vol II, 1916.

Right: Damaged German helmet, First World War. Militärhistoriches Museum der Bundeswehr / Meier.

cardiac rupture, as well as multiple gunshot wounds to the major blood vessels causing fatal haemorrhaging.

However, the number and type of actual heart injuries that doctors of the German military medical service were required to treat during the First World War, and from which soldiers died in many cases, exceeded all expectation. According to the *Handbuch der ärztlichen Erfahrungen im Weltkriege 1914–1918 (Handbook of Medical Experiences During the World War 1914–1918)*, written by leading German physicians:

> By far the largest proportion of cardiovascular casualties undoubtedly die on the battlefield or at the initial first-aid station. Thus only very few ever arrive at the field hospital or military hospital and still fewer reach a military hospital back home. Then a further 44 per cent of those who come into clinical care will perish as a consequence of infection. However, of those who recover, the great majority retain ensuing conditions involving inflammation and impairment to the circulation in the form of pericardial adhesions, adhesions of the surrounding area, the diaphragm, the lungs, etc.[3]

The infantry suffered the worst exposure to the hail of bullets. Protective *Prallab* (Ricochet) vests proved to be of no use. Not until after the war was it possible to estimate the number of front-line soldiers who had survived heart injuries. Soldiers suffering from a bullet lodged in the heart had the greatest chance of survival: up to ten per cent. Around 450 soldiers lived with bullets in their bodies without the need for an operation. In fact, operating rarely improved the situation. But discomfort in the cardiac area impaired both their capabilities and the future course of their health.

Above: Field-dressing station, Chambrai, 1915. Courtesy Wolfgang Eckart.

Right: Damaged German helmet, First World War. Militärhistoriches Museum der Bundeswehr / Meier.

New developments in vascular suturing and operating on vascular-wall aneurysms caused by injury were not given the chance to fulfil their full potential in the battle context, since the "ideal operation of the aneurysm is … even under the best conditions difficult, protracted and, above all, is in no way feasible in every case. The basic requirements for this are completely aseptic conditions and it is therefore absolutely out of the question at the front."[4]

Moreover, not all surgeons had been trained in the complicated techniques of vascular suturing. Thus the conventional use of the vascular ligature (cutting off the vessels) was maintained, early aneurysm operations were dispensed with, and conservative methods were given preference. Additionally, even though the location of bullets or grenade shrapnel lodged in the heart or in the major blood vessels had been perfected with the use of X-rays, here too, conditions of war prevented widespread practice:

> The large majority of these injuries do not reach the stage of X-ray examination; in particular, injuries to the major blood vessels lead almost without exception to a quick death on the battle field or on the front line. Among the millions of gunshot wounds brought about by this war, a substantial number of casualties with injuries to the pericardium and the heart reached military hospitals back home and here were, at last, correctly directed to X-ray examination.[5]

These clear discrepancies between the level of medical technology achieved by this time and the actual level of treatment achieved in war—discrepancies that countless soldiers paid for with their lives—were augmented by further

German stretcher-bearers approaching the German border near Bale following internment in Switzerland, November 1914, in E Nagel, *Die Liebestätigkeit der Schweiz im Weltkriege*, vol II, 1916.

shortfalls that can only be evaluated indirectly. Despite the formidable number of heart injuries, only very few individual cases were deemed worthy of coverage in medical journals during the war. There was no further mention of systematic provisions for resuscitation or for organ transplantation. Other themes dominated medical literature during the early war years, above all, the completely new experience of war on this scale. Particular attention was drawn to 'heart neuroses', where soldiers who to all intents and purposes were physically strong but were unable to deal with the physical strain and psychological horrors of the war responded with cardiac pain and arrhythmia (disturbance of the heart beat) that did not seem to be the result of any organic abnormalities in the heart.

Leading German physicians, including Sauerbruch and Rehn, were entrusted with military assignments rather than civilian research. The losses in the German Military Medical Corps resulting from the war were considerable: ten per cent of active officers in the Medical Corps, 7.9 per cent of medical NCOs, six per cent of the auxiliary combat doctors and junior combat doctors, 4.7 per cent of the Landsturm conscripts and civilian doctors. Of the 26,292 doctors deployed during the war, 1,783 (seven per cent) lost their lives.

The resulting stagnation of medical development caused by this alone continued in Germany during the post-war years, which were characterised by gaps in personnel and shortages of materials. It took years for world-famous sites of medical research and teaching in Germany, such as the Medical Faculty of the University of Leipzig, to rejoin international scholarly research, and they only survived this difficult time with the aid of external support.

The *Handbook of Medical Experiences*, however, did not concern itself with these fundamental humanitarian and scholarly shortfalls. The war was unilaterally and uncritically presented as the source of an inexhaustible development of knowledge. The majority of German doctors seemed incapable of reflecting upon the horrors of the war and did nothing to confront its disastrous psychological, social and economic consequences. While they continued to portray medicine as a humanitarian element of war, and to depict the conflict as a fundamental

German wounded in a military hospital Postcard, date and location unknown. Courtesy Wolfgang Eckart.

opportunity to gain insight into medicine, they contributed to the popular idea that war is manageable and that medicine can minimise its disastrous consequences, thus avoiding a proscription of war and effectively becoming complicit in this and future conflicts.

It is therefore not surprising that the preparations for the Second World War from 1935 onwards were made without ever considering the idea that war ought to be prevented. Instead, the focus was on how military medicine could be improved through increasing the capacity of military field hospitals and their ability to transfer patients, as well as the introduction of psychological training in the prevention of war neuroses and suicide among soldiers. But there was also a systematic reduction of provisions for soldiers, and from 1939, the killing of the mentally ill, Jews and the elderly in order to free up hospital beds. Thus the Second World War was no more humane; even from a medical perspective it turned out to be a diabolical disaster. Modern war is *a priori* the enemy of a profession that takes responsibility for the life and health of humanity.

Only a few doctors, for example Ernst Weiß (1888–1940) and Friedrich Wolf (1888–1953), became opponents of the First World War as a result of active duty at the front. Cardiologist Georg Nicolai (1874–1964), who specialised in ECG and was from 1910 professor of the medical clinic at Berlin's Charité hospital, also belongs to this group. Defamed for denigrating his own country, he was prevented from resuming his teaching activities after the war. In 1920, he was stripped of his *venia legendi* (permission to teach) and emigrated to Argentina in 1922.

Thus as long as the war continued, cardiac deaths in combat zones took place routinely, far away from all the successes of cardiac surgery. In his autobiographical novel on battlefield medicine *Die Pflasterkästen* (*The Plaster Boxes*), Alexander Moritz Frey (1881–1957) describes the rapid death in 1918 of a clerk of the Medical Corps on the Western Front, who was hit in the heart by a tiny piece of shrapnel from a grenade:

> And it ought to be demonstrated what sort of insignificant things can do away with someone … One morning,

Above: Wounded German soldiers and nurses drinking wine, Hilfs-Lazarett Ackermann, Wittenberg, private military hospital. Postcard, 19 March 1915.
Courtesy Wolfgang Eckart.

Right: Treatment of wounds, Reserve-Lazarett Marburg, Postcard, 9 February 1918.
Courtesy Wolfgang Eckart.

the younger of the two clerks was injured by a small piece of shrapnel the size of a lentil. He had heard it, the grenade, which exploded in the garden, evidently close to the wall, for we heard the crashing of timber and stone. Soon there is a rumbling of hasty boots going down the cellar stairs. They carry and drag the man, who can no longer walk, between them. What's wrong with him then? Has he been hit? Where has he been hit? He is not bleeding; his uniform is undamaged—as far as a German uniform can be in 1918. It is incomprehensible but plainly apparent; he dies in a few seconds. Here, it is clear how death conquers life, gradually taking hold with a firm and certain grasp … That man is pale, turns ashen, then yellow. His mouth snatches strongly for air once, twice, but equally often by an ever declining degree of energy. His lips turn pallid during the next gasp. They glow blue. He has closed his eyes. That they are now half open again does not mean he has come back to life. There is no return; it is the slackening of the eye-lids. They are at half-mast and will never again reveal a gaze, only crushed views of the past … Medical Captain Fünfer took hold of what was now no more than a body, which was already turning cold … 'Something very small has apparently penetrated right into his heart', Fünfer said, expressing his diagnosis in unintentionally and unwontedly absurd fashion.[6]

Being hit in the heart became a metaphor for the manifold physical and psychological, in many cases fatal, injuries that the First World War had inflicted on humanity. Erich Maria Remarque (1898–1970) used it in his novel *Im Westen nichts Neues (All Quiet on the Western Front)*:

> We are no longer youths. We no longer want to storm the world. We are fugitives. We are fugitives from ourselves. We were 18 and began to love the world and existence; we had to shoot at them. The first grenades that struck, hit us in the heart. We are cut off from the active, from ambition, from progress. We do not believe in that any longer; we believe in the war.[7]

"The battlefield /where pain and suffering rise / from red blood and manly slaughter. / Still, this is the seeding acre /Of healing charity / For you, the caring daughter!" Postcard, 1914–1915.
Courtesy Wolfgang Eckart.

Opening a door.
From *Das Pediskript*, 1925.
Photograph by R Müller, American Photo Studio, Prague.

LIFE WITHOUT ARMS

CARL HERMANN UNTHAN AND HIS MOTIVATIONAL WORK WITH DISABLED VETERANS IN GERMANY

Colleen Schmitz

"I saw the first transport of wounded soldiers and heard their moans. Terrible visions arose before me. How would these many thousands endure the crippledom that had befallen them?"[1]

These were the thoughts of 66 year-old Carl Hermann Unthan (1848–1929) as the disabled soldiers of the First World War began to return home. Himself physically disabled since birth, Unthan set out on a mission to assist these German veterans in coping with their injuries.

Unthan was born without arms and had developed exceptional dexterity in his feet and legs. Through self-training, he had learned an array of extraordinary skills that enabled him to be largely self-reliant. Not only could he dress and undress himself independently, but he could also fasten a necktie, eat with a knife and fork, and write legibly with both his mouth and his foot. Most extraordinary of all, he was a talented violinist, who had travelled around the world, giving performances in music halls and circuses.

Although heart problems had forced Unthan into an early, unfulfilling retirement, he felt a strong sense of duty to do his part for the fatherland and show his thanks to the soldiers who had sacrificed life and limb. He became involved in various initiatives to care for the injured veterans by sharing his experiences of disability.

ON STAGE

As Untham wrote in his autobiography *Das Pediskript* (*The Armless Fiddler*) 1925:

> Dr Bretter, the head of war hospitals in Berlin, asked me to send him photographs showing some of my extraordinary feats; they would be published in *Über Land und Meer* [*Over Land and Sea*] for the consolation of the wounded. I sent him four photographs and asked him if he did not think that lectures and demonstrations, which I should be very pleased to give, would be more effective. He was delighted with the idea and I gave my first lecture at the Königstadt hospital in the beginning of April 1915.[2]

Regulating a watch. From *Das Pediskript*, 1925. Photograph by R Müller, American Photo Studio, Prague.

Some of the leading doctors in Germany invited Unthan to lecture at their hospitals. Between 1915 and 1918, he gave his demonstrations throughout the German Empire, from Berlin, Dresden, Würzburg and Karlsruhe to Lublin (at that time Austrian), Bucharest and many smaller towns. He demonstrated everything from undressing to lighting a cigarette.

Unthan's audiences included both medics and injured servicemen, sometimes totalling as many as 2,000 at a single event. Statesmen and high-ranking military figures also attended.

> My offer to give a lecture at the Royal Hospital in Dresden was accepted. The King was present ... "My word, once again!" exclaimed the King after my first [rifle] shot … had cut a lead pencil in two, as he picked one of the halves up from the floor and searched for the other half. Instantly two officers of his suite were crawling about on the floor to find it. "May I keep them?" asked the King, holding both halves in his hands. "Certainly, Your Majesty, it only costs ten Pfennigs"—"What do you find most difficult?", asked the King at the end of the performance. "I don't find anything difficult, but playing the violin has required most practice"....
>
> I made good my promise to visit Ettlingen in the state of Baden. All citizens of that state who had suffered wounds to their arms or legs were assembled in a special hospital, which had originally been built for a military school. The latest improvements were installed there and all expedients that had proved helpful were adopted …. Baron von Künßberg, a Heidelberg professor, was heart and soul devoted to the care of the wounded. His *Manual for the One-Armed* was used in all hospitals. He invited me to see him and introduced me to Dr Eugen Fischer, Professor of Anatomy in Freiburg, then director of the Ettlingen Hospital ....
>
> I had found the doctors and their assistants most interested in their patients everywhere, but nowhere did I find such warm-hearted and friendly devotion as in Fischer and Künßberg, who, on the day of my lecture, had been promoted to professor. When I explained to them the effect that swimming has on the circulation they arranged for the wounded to be transported to the swimming-bath in

Above: Firing a rifle. From *Das Pediskript*, 1925. Photograph by R Müller, American Photo Studio, Prague.

Right: Sharpening a pencil. From *Das Pediskript*, 1925. Photograph by R Müller, American Photo Studio, Prague.

Karlsruhe, where I performed all my feats and got Künßberg to take some photographs of me....

In otherwise easy-going Munich, care was taken profoundly seriously. Prince Ludwig Ferdinand served as Lieutenant Colonel of the Medical Corps. He gave a lecture at each military hospital. At the Luisenbad, the medical officer marvelled at the fact that armless soldiers were propelled forward more quickly by means of their leg motion than the arm strokes of the soldiers with missing legs.[4]

IN FILM

> Lingner wanted for his museum, The Human, a work of world culture, which would be exhibited in many cities, a film in which I would demonstrate everything achieved via self-help. I was always ready for anything in the name of scholarship. I did not ask for anything in return other than the cost of travel and board.[5]

Unthan is referring to Karl August Lingner, the former director of the Deutsches Hygiene-Museum in Dresden, who was active in the field of public-health education. During the war, the museum increasingly focused on the health and medical care of soldiers and disabled veterans. As the masses of injured and often severely disfigured soldiers returned from the front, the

Above: Ringing a doorbell. Still from *Ausbildung der Füsse (!) als Hände*, 1975.

Right: Undressing. Still from *Ausbildung der Füsse (!) als Hände*, 1975.

public's initial enthusiasm for the war was beginning to wane. Moreover, stories circulating about the horrible suffering of soldiers in the field, as well as complaints about inadequate means of transport and poor medical care in the military hospitals, were adding to this shift in sentiment.

To temper these fears, various ideological initiatives sprang up throughout Germany. Among others, the Deutsches Hygiene-Museum developed various special exhibitions and films, propagating to a broad audience the state-of-the-art medical services for soldiers at the front and injured serviceman at home. The first such exhibition took place in 1915 and was "to bring reassurance and consolation to all sections of society".[5]

It is within this context that Lingner initiated the filming of *Ausbildung der Füsse (!) als Hände* (*Training the Feet as Hands*) with Unthan in 1915. Here, Unthan demonstrates how to ring a doorbell, open and close a door, undress, swim, dry off and dress.

The main part of the film is dedicated to swimming, which played a fundamental role in Unthan's life and was a major component of his self-help philosophy.

> That which is beneficial to the development of the body proves in the same way to be of value to the maintenance of it. Therefore, in you get, you disabled men! Try what I began to do and it will work for you.[6]

While in the pool, Unthan performed a variety of actions such as diving, floating, swimming forwards and backwards both on his back and on his stomach, swimming with one leg, swimming while holding an umbrella

Above: Preparing to dive after a small plate. Still from *Ausbildung der Füsse (!) als Hände*, 1975.

Right: Swimming backwards. Still from *Ausbildung der Füsse (!) als Hände*, 1975.

with one foot, and picking up objects from the bottom of the pool. "With genuine enjoyment, I collect plates, coins and even pins from 3 metre-deep water, but never remain under water for longer than 2 minutes."[7]

THE WRITTEN WORD

> As I have called on many thousands of you in the military hospitals, I would thus like to visit each individual in his place of suffering in order to demonstrate in how many different ways one can still help oneself. [I will find hope] where an able-bodied person can now only see utter helplessness and quietly abandons himself to despair, which is, unfortunately, very easily, almost always unjustly transferred to others.[9]

Thus begins the introduction of Unthan's 1916 book *Ohne Arme durchs Leben* (*Surviving Life Without Arms*). He drafted this illustrated handbook for disabled veterans at the request of orthopaedic doctors participating in the '1st Conference on War Orthopaedics' in Berlin in 1915, where he was invited to give one of his lecture-demonstrations. Unthan wrote 78 pages in 20 days. In 20 chapters he takes readers on a step-by-step guide to mastering life's new challenges. He gives a descriptive account of the most important events of his life and then goes on to describe how he masters everyday tasks without arms.

Unthan also expounds, sometimes in a rather grandiloquent style, on issues of mind and body, training, enjoyment and possibilities for employment. For him, determination and perseverance were crucial for leading a constructive life with a disability. Pity was to be scorned. With a strong will, hard work and a positive attitude, he believed it possible to lead a relatively autonomous and happy life.

Shaving. From *Das Pediskript*, 1925.
Photograph by R Müller, American Photo Studio, Prague.

Writing with his right foot. From *Das Pediskript*, 1925.
Photograph by R Müller, American Photo Studio, Prague.

PHILOSOPHY

Overall, Unthan wished to sensitise disabled veterans, the medical field and the general public to the notion that life with a disability need not be abnormal. In his various engagements in the service of war-victim care, he saw his role primarily as a motivator, limited to inspiring through example. When asked by a doctor at the onset of the war what he could his teach his patients, Unthan answered: "What they can learn will differ according to age, previous occupation and good will. Even the smallest [task] would fill their time and banish thoughts of suicide".[9] He saw his self-help strategies not so much as methods to be slavishly copied but rather as models of what could be achieved with the right attitude.

> To my friends injured in battle,
> Far be it for me to ask that you carry out that which I have achieved by means of self-help. Not even the way that has led me to my goal will be imposed upon you. However, I will reveal as many methods as possible to you, which you should develop and follow in your own ways. For the ways that lead to one and the same goal are countless … However, in one point all of these approaches concur: in the joy of each success, even the small ones. This is a joy that is so heart-warmingly deep that an able-bodied person would never get to know it in normal life. This success—or is it simply work aimed at success?—brings about a deepening of the soul, upon which a new standard of values can be built.[10]

In this way, Unthan championed work as a central tool in mastering the new challenges facing disabled servicemen.

> The period of transition, until you have found your way in the new Empire and have regained your psychological equilibrium, this 'difficult time', because it has befallen you so suddenly, for this I can only offer you one remedy, which also operates as an accelerant to help you carry the burden. The magic word is 'work'. No matter how you occupy yourselves, be it painting a box or carving a wooden board, do something! If you only do it, then you will see your achievements grow. Then you will have conquered the most difficult stage.[11]

Above: Unthan at one of his demonstrations. From *Ohne Arme Durchs Leben*, 1916. Photograph by A Bruhn, Hamburg.

Unthan's ardent wish to motivate coupled with his experience on stage as a musician made his lectures highly entertaining. His demonstrations were often accompanied by a piano and were aimed specifically at getting a laugh. The doctor Hans Würz stated in his book *Siegreiche Lebenskämpfer* (*Victorious in the Fight for Life*) that Unthan "pours dry humour from his feet".[12]

> Without fail, I succeeded in brightening the cheerless faces of the wounded soldiers to the point of elation. I had gradually become accustomed to the sight of the wounds, which initially threatened to make me feel heart sick.[13]

Not all medical professionals approved of Unthan's choice to put himself on public display. Konrad Biesalski, a pioneer in the rehabilitation field in Berlin at the time, termed people who publicly exhibited their handicap in order to make a living *Reklamekrüppel* (publicity cripples). Unthan's image stood in opposition to the new ideas of Biesalski and others on integrating the disabled into society. Such attitudes, however, did not deter him. Invitations to appear at medical hospitals continued throughout the war, and he proceeded with his lecture series despite declining health. Even in the face of dwindling savings, he refused to accept money for his work with the disabled, believing that this would jeopardise the legitimacy of his cause.

> I request that remuneration is disregarded. I have attempted to inspire everyone, who can still stir themselves, to work and to banish their thoughts of suicide. If it becomes known that I have drawn pay, then my influence will likely dwindle. This would not be favourable to me.[14]

Unthan was awarded a Red Cross Medal and a Cross of Merit for his war work. When the war ended, the military hospitals no longer requested his services, but various professors of anatomy, surgery and orthopaedics continued to call on him. On his 75th birthday, at the request of his wife, he retired from lecturing.

> With all my power I strive to spread sunshine and roses over the future path of your lives. If only a very small fraction of my wishes are fulfilled and illuminate and warm you on your new journey, I will feel royally rewarded.[15]

Shaking hands. From *Ohne Arme Durchs Leben*, 1916. Photograph by A Bruhn, Hamburg.

SOLDIERS' BODIES IN THE WAR MACHINE

TRIAGE, PROPAGANDA AND MILITARY MEDICAL BUREAUCRACY, 1914–1918

Ana Carden-Coyne

Austin Osman Spare, *An Aid Post*, drawing in coloured chalks, 1918. Wellcome Library, London.

Early in 1914, the British War Office estimated that 50,000 beds would be needed to care for the sick and wounded. Unprepared for the scale of warfare, the Royal Army Medical Corps was soon facing mass casualties on an unprecedented scale. As the year drew to a close, more than 73,000 wounded patients had returned to Britain for hospitalisation. This situation placed enormous stress on logistical, professional, medical and personal contingencies regarding the effective evacuation and treatment of the wounded. Military medical bureaucracy—procedures and policies for overseeing both medical staff and patients—became a critical development of the war.

This chapter considers the logistics of transporting the wounded, and the significant role that triage played in the war. It shows how accusations of neglect against the RAMC were met with a propaganda campaign to counter this image, and explores how civilian physicians employed in the RAMC came into conflict with the system. Finally, it reveals how wounded soldiers found an imaginative way of expressing their view that their bodies had become mere cogs in the military machine.

INSTITUTING MEDICAL LOGISTICS: TRANSPORT AND TRIAGE

The Army Medical Services dealt with the mass casualties by developing bureaucratic systems of treatment. Controversies, however, such as professional tussles between civilian practitioners and regular military medical staff and conflicts over the safe transportation of the wounded, undermined their efficiency. The role of triage—a system to sort the wounded by severity of injury in relation to treatment time and resource allocation—meant that some doctors encountered new ethical dilemmas that challenged their Hippocratic ideals, since it was "practically impossible" to attend to all cases.[1]

The RAMC system divided labour, resources and infrastructure into three zones: Collecting, Evacuating

Gilbert Rogers, *Stretcher Bearers of the Royal Army Medical Corps*, oil on canvas, 1919.
Wellcome Library, London.

Carriage of the wounded in the trenches, First World War.
Wellcome Library, London

and Distributing. The principle of the Collecting Zone was to mark out an area where the wounded were taken from the battlefield to one of the Regimental Aid Posts (RAPs)—a small underground clinic or temporary structure, as seen in Austin Osman Spare's painting, *An Aid Post* (see page 66).

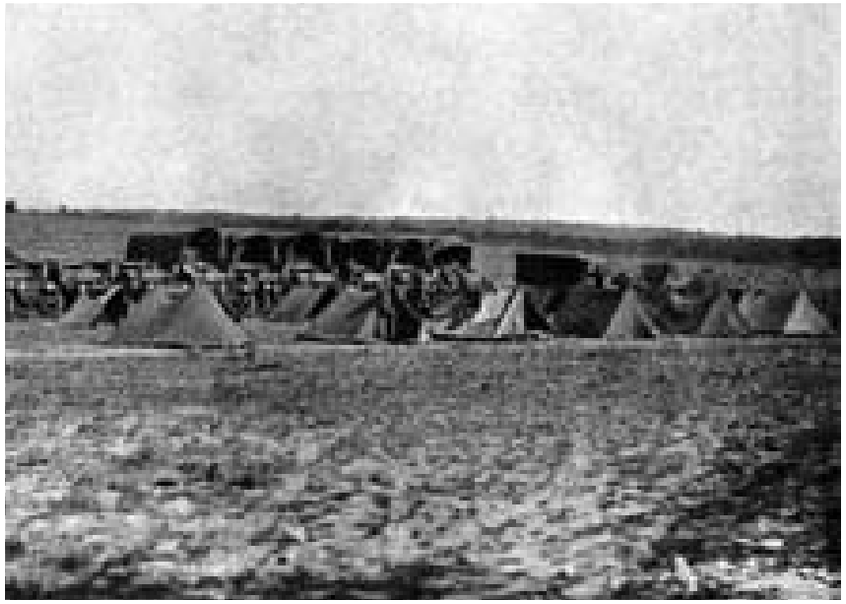
Collecting the wounded was a hazardous procedure that often endangered the lives of rank-and-file stretcher-bearers, as shown in Gilbert Rogers' heroic painting opposite, which shows a group struggling to retrieve a wounded man from a shell hole.

Bearers rescued patients and delivered them to the Regimental Aide Post (RAP), where the Regimental Medical Officer (RMO) dressed wounds, and made triage decisions about who should be transported to the Advanced Dressing Station (ADS), based on the extent and severity of injury and whether it was treatable. The triage process was repeated at the ADS, where the Medical Officer decided who would be transported further on, who would remain, who would be returned home and who might be sent for a short rest before being ordered back to the frontline. In his 1915 diary, RAMC Captain DWJ Andrews reflected upon the pressure and tragedy of triage at the RAP:

> All moribund cases we kept, it being useless to send them on. It was a trying time. For the patients are all such young healthy lads, and it is rather nerve racking to see them cut off in the prime of life to satisfy the whims of governments.[2]

Even in the heat of frontline duty, triage could make hardy medical men reflect on the cost of war. RMOs and surgeons often found these decisions personally taxing. Triage also impacted upon stretcher-bearers and orderlies. Though they worked "splendidly", Andrews recalled, "the majority of them were quite unused to such sights", and experienced great stress in administering these life-or-death decisions.[3]

During battle periods, surgeon Henry Kaye noted the "delirium of work" and how it affected patients: "it was truly piteous to see the state those men were in".[4] As the war dragged on and casualties peaked, a vicious cycle of exhaustion developed, and the low success rates



Motorised field hospital, First World War.
Wellcome Library, London..

of some operations further demoralised staff. Some RMOs became depressed, turned to alcohol, or were sent home with "their nerves gone"; others developed "unhealthy" stress reactions.[5] Although medics often imagined that they would never get used to the conditions of war, over time they became desensitised to what was happening around them. Kaye admitted feeling "oppressed" by his patients, given the likely outcome of their injuries.[6]

When a decision was made that a patient was "too bad to touch" or was too close to death for intervention, he was "detained" by the Field Ambulance at the Main Dressing Station (MDS), which meant trying to make him "comfortable" before he died. Physicians could not waste time and resources on attempting to revive such cases.[7] Nevertheless, RMOs were often uncertain about these wartime decisions; for some, triage lingered on as a troubled memory. In 1922, the yearbook of the 44th Field Ambulance recalled:

> It was always sad, after big pushes, to see at RAP's and ADS's bad cases, such as abdominals, put on one side to die in order to give those less badly wounded the chance of recovery … Poor abandoned ones! We trust that God especially covered you with His wings, and that your people at home never knew the tragedy of your last hours.[8]

At the RAP, treatment was basic: arresting haemorrhage, splinting fractures and cleaning wounds with antiseptic. Often, systems were ad hoc. Sometimes the wounded did not even see an RMO in the first phases of triage. For instance, when the RAP was occupied, men could be sent straight to the ADS having undergone neither diagnosis nor bandaging and pain relief. At the No 8 Casualty Clearing Station, the Field Ambulance appeared "indifferent", "none of the fractures" arrived cleaned, and "many cases came down bleeding".[9]

When the triage decision had been made, a Regimental Label describing the injury was attached to the patient's jacket. A white label meant a light case, whereas a red and white label indicated a serious one. The labels produced at the RAP could be amended at the ADS or further behind at the MDS.

Regimental Aid Post, First World War.
Wellcome Library, London.

The introduction of this bureaucratic process was meant to aid efficiency and treatment; however, the patients understood the significance of the labels only too well. Journalist Basil Clarke recorded the conversations of men lying on stretchers in a Beauhamel cellar, which served as an RAP. The wounded "lay anxiously speculating as to their fate":

> I was watching the distribution of pleasure and pain such as only a wounded Tommy can know. But the glittering, glad eyes of the lads who received a red ribbon and the smothered groans of those who were given a white showed me that the distinction was of great moment to these men.[10]

A white label may have indicated a less serious injury, but it also signalled to its recipient that he was not going home to "Blighty".

RAP trenches were often so narrow that stretchers had to be tilted or patients lifted by blanket, which could distress both the injured and the bearers.

Hospital Tag of Private Walter Percy Bray, 1915–1924.
Wellcome Library, London.

Subject to continual bombardment, the Collecting Zone was dangerous, generating fear and uncertainty among patients. RAPs were destroyed, and site-relocation caused confusion for stretcher-bearers, who wandered around trying to find them. In emergencies, RMOs improvised makeshift RAPs from blankets tied to trees or amongst the rubble of buildings.

Field Ambulance teams of bearers and medics worked between the RAP, the ADS and MDS. The ADS might be far away from the RAP, which could drastically affect the patient's survival. At Sanctuary Wood (Ypres), the distance was five kilometres and the journey could take up to five hours. At the ADS, the RAP label was replaced by the Field Medical Card, which allowed for notes. However, this system could also cause confusion. Private Walter Percy Bray's card, for instance, had a diagnosis of anaemia recorded on one side and scarlet fever on the other. Medics regularly complained about such inconsistencies.[11]

The Evacuating Zone included two Casualty Clearing Stations (CCS) and, further behind, the Stationary Hospital. Patients were evacuated along routes called the 'lines of communication', by road, railway and canal.

The third area, the Distributing Zone, was where the wounded received their final treatment, and referred to hospitals at the base, overseas or at home. The simple structure of the three-zone model was not always implemented, however, especially with constraints on mechanical transport and medical manpower. Evacuation plans were drawn up by hand and colour-coded, but in practice could be complicated and inefficient.

The question of transporting patients in ambulances and by road was a fraught one throughout the war. Some Commanding Officers complained that patient evacuation was secondary to the transport of munitions and

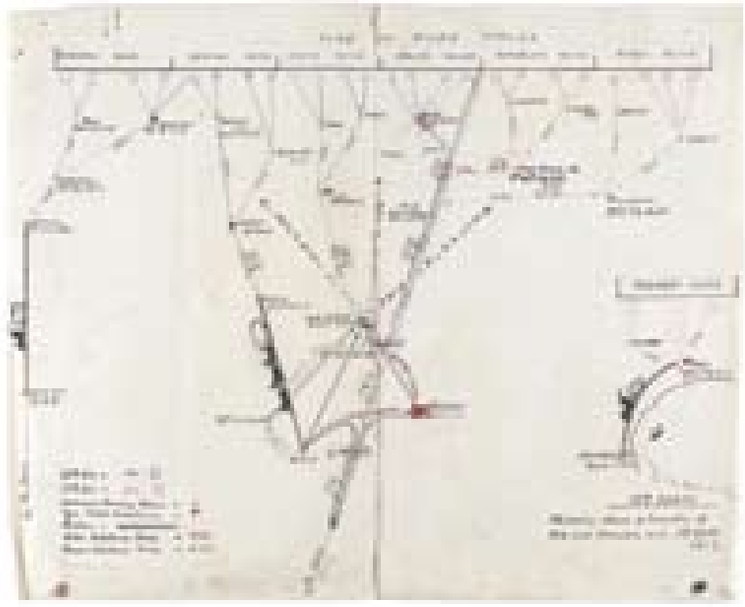


Diagram illustrating the scheme of evacuation of sick and wounded in Macedonia, 1 September 1917.
Wellcome Library, London.

troop replacements. After a series of scandalous reports of patient neglect by the RAMC, intense political pressure had been placed on evacuation speeds. The wounded were continually moved on stretchers, wagons, trolleys and ambulances, which was often detrimental to recovery. Whilst medical propaganda claimed that the best motorised transport was being used, in some theatres of war camels and other animals were used, or men had to improvise, sometimes pushing the transport by hand.

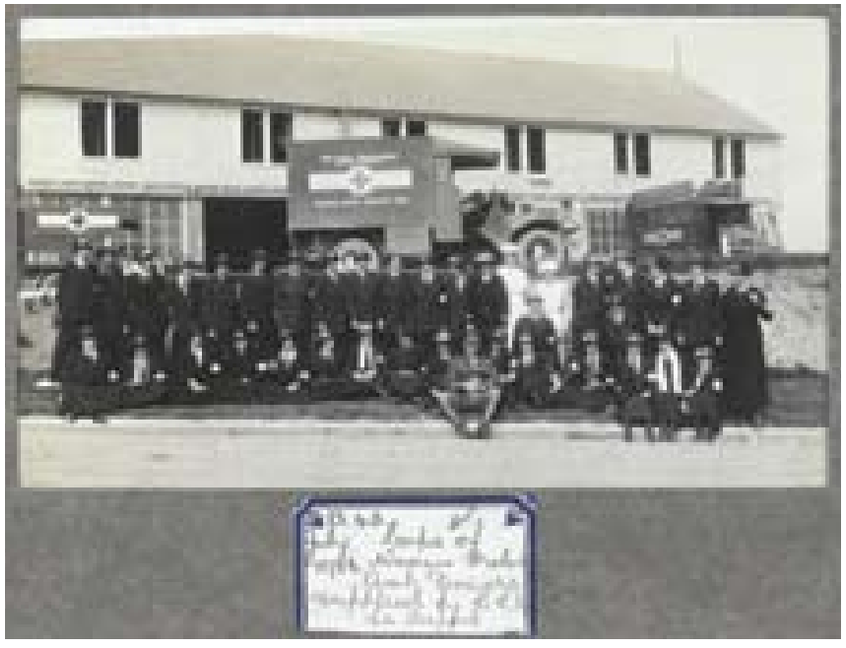
At home, politicians boasted that rescue speeds were within four hours, and hospitalisation within 12 hours. Back at the front, however, Captain Kaye commented that "people forget what a great additional strain any transport imposes on the patient … this express transport has cost their lives".[12] He wrote in his diary that although the motor transport had "done wonders in this war", from the patient's perspective, "the abiding recollection of the worst part of the whole business in the wounded man's mind is his time in the ambulance".[13] Patients often preferred female ambulance drivers, who took more care with the hazardous road conditions. A soldier wounded three times said, "I would a thousand times prefer to be driven by a woman"; others commented that "they bump less" and "look out for every pebble in the road".[14]

While patients complained about jolting rides across ragged terrain, physicians worried about blood loss, shock and cold. This was why the choice of site for the CCS was so important: good roads ensured the smooth transport of the wounded.

As the war continued, the CCS shifted from an amorphous, temporary and mobile structure to a more stable one with a greater range of equipment undertaking multiple roles. Later in the war, staff from several Clearing Stations were pooled into one locale, assisted by mobile surgical teams, but the great length of the frontline did affect its proximity to the Evacuating Zone.

Yet senior officials in the RAMC appeared not to comprehend fully the stressful conditions of warfare and mass casualties. Captain Andrews recalled how the Assistant Director of Medical Services had insisted on drilling

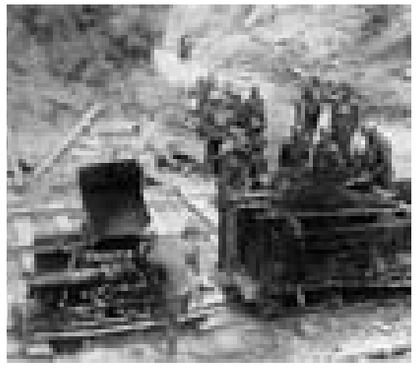
Above: Evacuating wounded men on an improvised trolley line from No 3 CCS, Pushviller, to an ambulance train, 1916.
Wellcome Library, London.



Below: Women motor ambulance drivers, 1916.
Wellcome Library, London.

Above: Horse railway ambulance transport,1916.
Wellcome Library, London.

Right: Stretcher cases being carried on a light railway near Feuchy, during the Battle of Aras, 29 April 1917.
Wellcome Library, London.



a group of field surgeons for "An Urgent Aseptic Operation", with everything sterilised and the officers gowned and washed. Andrews thought this "utterly absurd", given the conditions at the front.[15] Compounding the pressure on resources and training time, the Field Ambulance became "a dumping ground for Medical Officers" who were often insufficiently skilled.[16] Indeed, many senior medics raised the issue of competence and training, asserting that Medical Officers were unaware of treatments and procedures, and that the flow of information was slow to reach across the three zones.

PROPAGANDA AND PROFESSIONAL CONFLICT

From the outset, transportation of the wounded had been politically and ethically sensitive. Rumours circulated that casualties were often left for days in No Man's Land, before medical assistance arrived. In many cases this was true, especially since wounded men often crawled into shell holes for protection and then fell unconscious.

To defuse public anxiety, media campaigns were conducted to promote an image of the RAMC as a modern machine, capable of speedy and painless evacuation. Although modern machines produced horrific injuries, new technology and medical science were seen as delivering innovation to the wounded body, which was highlighted in medical propaganda as modern progress. *The British Medical Journal* enthused that the Collecting Zone had "an atmosphere all its own—bracing, suggestive [and] thrilling" for the physician.[17] Newspapers and illustrated magazines featured stories on medical advances, asserting the superiority of the Allies. In October 1914, the medical

REMOVING THE PATIENT AFTER SURGICAL ATTENTION.

"Removing the Patient After Surgical Attention", in "How the Wounded were Brought Home", *The Great War Magazine*, February 1917.
Wellcome Library, London.

correspondent for *The Times* reported on floating barge hospitals, which could be boarded "without disturbing the wounded man".[18]

Photographs of mobile operating units and other technological innovations were also published. Patients were shown being treated gently and professionally, and the extent of individual care was stressed: "everything was arranged for maintaining perfect steadiness, as the patient was lifted into the mobile unit by five attendants".[19]

Across Britain, ambulance trains were exhibited as the epitome of modern technology and efficiency, equipped with all the latest devices. However, when Captain Andrews loaded 989 wounded men onto a train at Bethune Station, Northern France, he was appalled that they had to share one blanket between four, that several carriages were without lights, and that most of the second-class carriages were unclean.

In the public domain, however, officials made powerful statements of support for the RAMC. Returning from a hospital tour of Boulogne and Calais, Lord Knutsford wrote to *The Times*, asserting his confidence in the Army Medical Services:

> For the peace of mind of the public, and especially of those who have relatives wounded, I do ask to be believed when I say that the arrangements, as far as my hospital experience permits me to judge, are amazingly perfect.[20]

Despite vouching for high standards in the hospitals, he admitted: "I cannot, of course, speak as to the treatment of the wounded at the front", but felt sure that all complaints were dealt with appropriately. Knutsford praised the evacuation procedure of the RAMC for "smoothness and perfection of the whole organisation". Closing his letter, he made an interesting comment: military medicine was anything but disciplinary, and was close to the civilian model:

> The whole spirit … [was] not the military 'go there,' 'Come here,' 'Do this,' but … everywhere there prevails a tone of sympathy, kindness and gentleness, which makes one's heart beat a little faster.

Hospital ward on a French canal barge, First World War.
Wellcome Library, London.

With sentimental images of tender nurses, committed doctors, and their "untiring devotion and forgetfulness of self", Knutsford reassured the public of the humane treatment given to wounded soldiers. This RAMC propaganda also reached the patients, raising their expectations of care and treatment, which were often disappointed in reality. Stories of devoted service concurred with images deployed in humanitarian advertising and fund-raising literature, such as in the Red Cross poster *The Greatest Mother in the World*, 1918.

The objective of medical propaganda was to maintain public morale. Critics of the RAMC were blasted as "irresponsible", "biased" and ignorant of the facts, as well as "venomous and harmful".[21] Advocates like Lord Northcliffe highlighted the heroism of the RAMC. Writing for *The Times*, he spoke of their bravery and listed the number of medics wounded, killed and missing. He also praised their "chivalry" in forsaking "lucrative practices in London, or Melbourne, or Montreal, in a great rally of self-sacrifice". In marked contrast to surgeons' diaries, Northcliffe extolled the RAP as a place of "lightning diagnosis, antiseptic application, bandaging, a hastily-written label tied to the man's breast, and the wounded one is borne off and away" to the ADS.[22] Supporting this testimony, the editor offered his own praise for "The Medical Army" and its "masterly organisation", jeering: "Who says the British cannot organise?".[23]

Countering rumours of high rates of amputation, *The Times* reported that "conservative surgery" was being practised, and that Sir Alfred Keogh had appointed Senior Consultants for all major operations, averting any chances of "serious mutilation" by inexperienced surgeons. Even so, heated debates were raging within medical and surgical circles as to what was the best way to treat wounds and retard the growth of infectious bacteria that led to gangrene and amputation.[24]

In 1916, a confidential memo was sent by a group of prominent civilian surgeons claiming that patients were tolerating awful conditions, for fear of appearing to lack "pluck and self-sacrifice". Physicians, too, felt pressure to conform to military practices and to keep silent or risk being accused of "unpatriotic" attitudes.[25]

Armoured ambulance breakdown in the Caucasus, 1911. Photograph by Montague Henry Knapp. Wellcome Library, London.

Although surgeons argued for more specialists to be employed in the service, Colonel Charles Burtchaell retorted that such "extreme care" only encouraged the patient "to concentrate on his maladies".[26] Given the rising instances of shellshock and severe incapacity from wounding, the Armed Forces were concerned about manpower shortages and maintaining even wounded soldiers in its rotation system. Medical and surgical staff felt conflicted about their professional and national duty, which were sometimes at odds. As Captain Harold Dearden wrote in his autobiography:

> To succour the wounded, that they might with greater celerity return to wound or be wounded on a subsequent occasion … shifted the plane of the whole grim business from the illogical to the insane.[27]

War propaganda emphasised the defence of British liberalism, and yet physicians were prevented from challenging the logic of the system or the orders given. As Kaye noted: "our democratic principles of which we hear so much certainly do not extend to the Army".[28]

Another problem was that the entry rank for physicians was as low as Lieutenant, a position with little autonomy that elicited "grumbling" and "crankiness".[29] Officials responded derisively to such complaints: the "God given Surgeon always has a grievance and these are the men who cause the trouble".[30] Medics might be summarily moved from one field hospital to another, to the extent that the Surgeon General, Sir William Watson Cheyne, investigated a range of complaints from consultant surgeons. Colonel Burtchaell's response was to dismiss the surgeons as "men who are no good".[31]

Civilian medical staff often regarded military red tape as a hindrance to the delivery of effective medical care. Lord Charnwood's 1917 report, however, disputed this claim, arguing that continuity of treatment could not be guaranteed without it, and that case sheets, special reports and index cards had to be completed by men with medical qualifications (rather than administrators). The function of bureaucracy was not just medical; it also served as proof of treatment, used by Medical Boards and the Ministry of Pensions to determine a soldier's medical discharge, the degree of incapacity and the extent of pension he might be awarded. Yet accurate records were difficult to keep with large volumes of surgical cases and lengthy operative periods.

Other doctors felt frustrated that the system did not seem to function at all; patients arrived at the CCS from the Field Ambulance with their wounds incorrectly recorded, suggesting that MOs were time-pressed, or that stretcher-bearers without medical knowledge were filling in cards. In Britain, senior surgeons complained that the wounded were returning to civilian care "without even the briefest of case notes".[32] The assembly line of wound management meant that each patient was treated by many different RMOs as he was transferred from RAP to CCS to various base or home hospitals. This affected how his medical history and consequent condition were understood.

Bureaucracy also generated professional and class tensions, such as those between civilian experts with command positions and army

AE Forringer, *The Greatest Mother in the World*. Lithograph on paper, 1918.
Collection Imperial War Museum, reproduced with kind permission of the British Red Cross Society

administrators. Captain Upcott, Commanding Officer of the 37th CCS recalled:

> I fear I shocked Sergt. Andrews this evening; he pounced on me just as I got in with some fatuous enquiry about a memo from DDS and T relative to GRO something or other. I said, 'Sergeant I really don't know anything about it, but can you tell me the name of this flower?' He was scandalised at my flippancy. I don't believe he has an unofficial side to his nature'.[33]

Such incidents struck at the troubled heart of these new social relations being created within military medical

Left: Captain Bruce Bairnsfather, "The Eternal Question", cartoon, *4th London General Hospital Gazette*, Christmas Supplement Edition, 1916.
Wellcome Library, London.

Right: "I don't want to be massaged!!!", Cartoon, *RAMC 1127/1, First Eastern General Hospital Gazette*, no. 19, December 1915.
Wellcome Library, London.

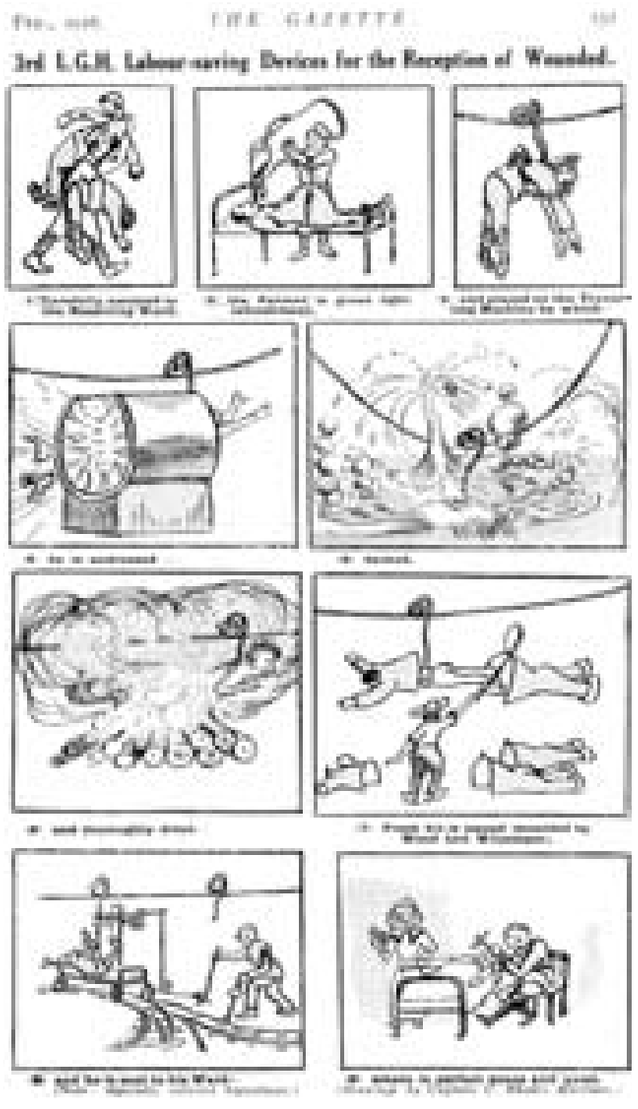
culture. The institutional machine could not tolerate challenges or indifference to the system and its hierarchies of power, and officials found it hard to accommodate those outside who had little rapport with its structures and their significance. Equally, civilian surgeons—and patients too—could not always respect the logic of the military machine and its undervaluing of the individual. At a deeply human level, civilian doctors, conscripts and volunteer citizen soldiers maintained a desire for civilian relations that respected individuals.

To an unprecedented extent, then, the Army Medical Service had to contend with its new character as a social community of civilians and regulars who were often in conflict, rather than a hierarchical structure founded upon the acquiescence expected in a military institution.

PATIENTS IN THE MEDICAL WAR MACHINE

Patients were largely ordinary soldiers—volunteers and conscripts—who valued the treatment and the care they received. However, they could also be resistant to this system, which confronted them with a system of power and authority over their bodies, calculated as units and valued only when functioning as useful components in the war machine. They responded by asserting their own form of empowerment through cultural means. In hospital magazines, poems, diaries and memoirs, those wounded in service to the state reframed their experiences and resisted 'the system' with their creative imaginations and wit, portraying the medical machine with dark humour.

Patient cartoons were a remarkable feature of the cultural and medical history of the First World War. They reveal an image of medical bureaucracy from the patient's perspective. Many countered the propaganda by turning the public image of the military hospital upside down. Instead of an ordered, safe and congenial space for healing—as described in media campaigns—the hospital was depicted as brutally industrialised, often in the hands of incompetent medical staff and merciless bureaucrats. Cartoons often showed cruel treatment and even surgical experiments being conducted on patients.

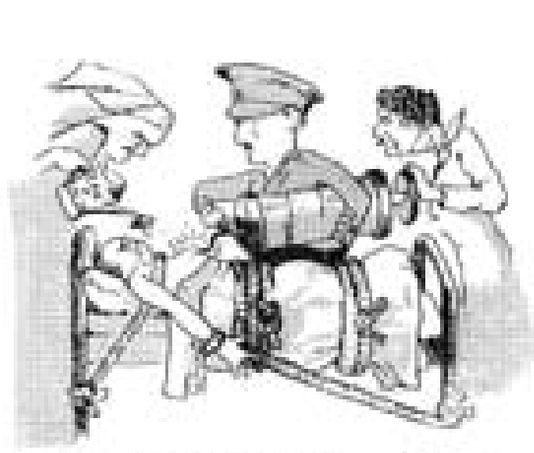


RAMC surgeons and MOs were represented as 'hacks' or drunks—cutting off their own fingers, practising on tree stumps with saws, and inflicting pain with giant needles. The pressure imposed on patients to recover quickly and return to the front was also lampooned. In one cartoon by Captain Bruce Bairnsfather, a wounded man appears exhausted and exasperated by "The Eternal Question". The caption reads:

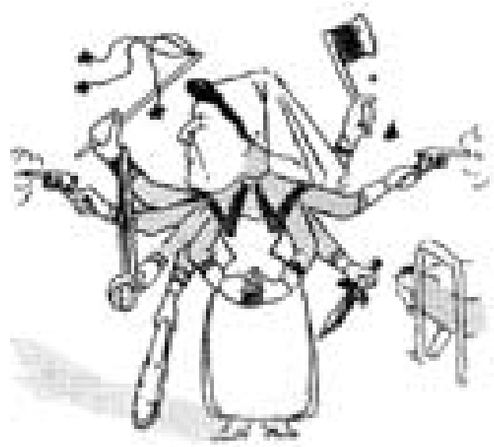
> When you feel you'd like to start an Offensive again, when the 200th man of this sort comes up and asks you for: 'your name, your age, your next of kin, how long in the Army, do you keep white mice, if not, why not etc etc etc.

Institutional authority was just as strictly adhered to in the wards as it was in the barracks: patients had to 'stand to' when doctors came in, could be reported for misdemeanours or 'CB' (confined to barracks), which might include cleaning latrines or being deprived of a meal. Those with suspected 'SIWs' (self-inflicted wounds) might endure unofficial harsh treatment, such as being refused meals and medication. Medical staff had the power to get the patients into trouble, even for talking during 'lights out'. One anonymous story described an argumentative patient who challenged the hierarchy: "even with a Sergeant—ye Gods! Brave fellow! In any other patient such a liberty of thought, or rather free expression of it, would have given offence to many."[34]

Frustrations with the bureaucratic regime could lead to defiance of treatment. In another patient cartoon,



Curing a hero by means of serum



For maintaining order in a "Convalescent Ward."

Opposite and above: Capt C Rhodes Harrison, "3rd LGH labour-saving devices for the reception of wounded", cartoon, *The Gazette of the 3rd London General Hospital, Territorial Force*, Wandsworth, February 1916. Wellcome Library, London.

an amputee screams at the nurse: "I Don't Want to be Massaged!!!".

Some soldiers felt belittled by de-lousing procedures—where they were stripped of their uniforms and forced to wear blue hospital gowns, depriving them of their dignity and status as wounded heroes. Patients complained that in being conveyed from one treatment site to another, and in having uniforms removed, personal items were stolen or mislaid, so that insiders nicknamed the RAMC 'Rob All My Comrades'.

Just as writers and artists of this period imagined soldiers as mechanised or weapon-like—an image designed to reveal modern war as dehumanising—patients and medical staff portrayed the soldier's body in the same way. But whilst *The Times* praised the "precision" of "the machine" as the standard of British military medicine, patients often presented a very different view.[35]

In one cartoon, military discourses of 'saving labour' are ridiculed as an industrialised disregard for the human body: a wounded man is put on a conveyor belt and goes through a series of mechanised procedures described as "Labour-Saving Devices". The ironic captions undercut the meaning of the scenes: the patient is "carefully assisted" to the Receiving Ward, but the image depicts his rough handling by an orderly. Next, the patient is tied to the bed and force-fed with "light-refreshment". Then he is tied with a rope and conveyed through a series of machines that violently undress, bathe and dry him. Still bound, the half-naked patient is forcibly re-dressed by lasso, and then is carted by wagon to the ward. The final image of "perfect peace and quiet" includes a nurse yanking his arm to read his pulse and a medical officer scrutinising his details.[36]

That the military medical authorities tolerated—even encouraged—this carnival of gallows humour suggests that such representations were treated as a pressure valve for tensions within the British system of military medical logistics, some of which—such as triage—were subsequently imported into civilian medicine.

MARY BORDEN

THE FORBIDDEN ZONE

Mary Borden, the daughter of a wealthy businessman from Chicago, set up a hospital unit on the Western Front on the outbreak of the First World War. Awarded the Croix de Guerre by the French government, she remained with the unit until 1918.

He was a man of the soil, of the dark earth, with the heavy power of the earth in him. The bright sun shining on his massive unconscious bulk made the darkness of his lost consciousness visible. He seemed to lie deep, distant, withdrawn in a shadowy abyss ... But his immense body continued, in spite of his absence to hum and drum like a dynamo, like a machine whose tremendous power takes time to run down, and his breath came whistling and spurting through his rough bruised lips like escaping steam.

The old stretcher-bearers lifted him again grunting, and brought him in to us and hoisted him with difficulty on to the narrow white table, in the white room full of glistening bottles and shining basins and silvered instruments, among the white-coated surgeons and nurses. His head hung over one end of the table, and his feet over the other, and his great freckled arms hung helpless and heavy down at either side. Thick curling bunches of red hair, wiry and vigorous, grew out of his enormous chest. We stripped his body. It lay inert, a mountainous mass, with the rough-hewn brick-red face tipped back. His sightless face reminded one of the face of a rock in a sandstone quarry, chiselled with a pick-axe, deeply gashed. His closed eyes were caves under bushy cliffs, his battered mouth a dark shaft leading down into a cavern where a hammer was beating.

Because he was so big, his helplessness was the more helpless. But one could feel life pounding powerfully in his body—senseless life, pounding on, pumping air into his lungs, keeping his heart going. Yes, he would be hard to kill, I thought. Even a bullet in the head hadn't killed him.

I counted his pulse. It was strong and steady.

"Shot through the mouth. Revolver bullet lodged in the brain." Monsieur X was reading the ticket that had been pinned to the man's blanket in the dressing station behind the front line.

But how? I wondered. How queer, I thought. Shot in the mouth—through the roof of the mouth. He must have been asleep in the trench with his mouth open. And I imagined him there, sprawling in the muddy ditch, an exhausted animal with his great stupid mouth open; and I saw a figure crawl in beside him and put the barrel of a revolver between his big yellow teeth. Fool, I thought. You fool—you big hulking brute beast—going to sleep like that in utter careless weariness.

But no it was impossible. In this war such things didn't happen. Men were killed, haphazard—maimed, torn to pieces, scattered by shell fire, plugged full of shrapnel, hit square sometimes by rifle bullets, but not shot neatly through the roof of the mouth with a revolver.

They were whispering as they bent over him. Monsieur X frowned, pinched his lips together, looked down at the great, gentle unconscious carcase sideways.

"But how?" I asked. "Who?"
"Himself. He shot himself through the mouth. It's a suicide."
"Suicide!" I echoed the word vaguely, as if it contained a mystery. There was something queer, out of the ordinary, about it, shocking to the surgeons and orderlies. They were ashamed, worried, rather flustered. "But why suicide?" I asked, suddenly aware of the extraordinary fact that a personal tragedy had lifted its head above the dead level of mass destruction. It was this that shocked them. He's not young, I thought, cutting the bandage round the rough unconscious head with its shock of matted red hair. A peasant, probably—very stupid—an ox of a man.
"Why suicide?" I asked aloud.
"Panic", answered Monsieur briefly.
"Fear—he tried to kill himself from fear of being killed. They do sometimes."
"This one didn't."
"No, he didn't succeed, this big one. He ought to be dead. The bullet is here just under the skull. It's gone clean through his brain. Any other man would be dead. He's strong, this big one."
"You'll extract it?"
"But certainly."
"And he will live?"
"Perhaps."
"And what then?"
"He'll be court-martialed and shot, Madame, for attempted suicide."

They were strapping his iron arms and legs to the narrow table. Someone lifted his heavy head. Someone pulled his great bulk into position and bound him to the table with strong leather bands.

"Don't do it!" I shouted suddenly. "Leave him alone." I was appalled by his immense helplessness.

They went on with their business of getting him ready. They didn't hear me. Perhaps I had not shouted aloud. "You don't understand", I cried. "You've made a mistake. It wasn't fear. It was something else. He had a reason, a secret. It's locked there in his chest. Leave him alone with it. You can't bring him back now to be shot again."

But they clapped the ether mask over his face, stifling his enormous stertorous breathing, and with that he began to struggle—the dying ox. Life, roused by the menace of the suffocating gas, sprang up in him again—gigantic, furious, suffering, a baited bull. It began plunging in him, straining, leaping to get out of his carcase and attack its enemies. A leather thong snapped, a fist shot out, knocking over bottles and basins. There was a crash, a tinkle of broken glass, a scramble of feet, and suddenly through the confusion I heard a thin soft anguished voice cry as if from a great distance, "Rosa, Rosa!" It came from his chest; it sounded like the voice of a man lost in a cave. It came from under his heaving side where the bushy hair grew thick and strong—a hollow heartbroken voice, issuing from his blind unconscious mouth, in a long cry—"Rosa, Rosa!" Twice again he called Rosa before they could clap the ether mask down again on his face.

It was a neat operation and entirely successful. They took the bullet out of the top of his head, bandaged his head up again, and carried him away through the sunny afternoon to be put to bed.

"He will surely die in the night", I said to myself, and I went again and again in the night to see if, happily, he were dead; but always, standing beside the shadow of his great bulk, I could hear him breathing, and once I thought I heard sighing on his shrouded lips the name of the woman—Rosa.

"He can't live", the night nurse said.

"He can't die", I whispered to myself. "Life is too strong in him, too hard to kill."

He was much better next day. I found him sitting up in bed in a clean pink flannel night shirt, staring in front of him. He didn't answer when I said "Good morning", or take any notice of me. He hadn't spoken to anyone during the day, the nurse told me, but he was very obedient and ate his soup quietly, "as good as gold", she said he was. "A remarkable case", Monsieur X said. "He ought to be dead." But there he was sitting up eating his meals with an excellent appetite.

"So he knows what will happen?" I asked, following the surgeon to the door.

"But certainly. They all know. Everyone in the army knows the penalty."

The suicide did not turn his head or look in my direction. He was still staring straight ahead of him when I came back and stood at the foot of his bed.

Who are you? I wondered, and who is Rosa? And what can I do? How can I help you? And I stood there waiting, miserably spellbound by the patient brute who at last turned on me from his cavernous eyes a look of complete understanding, and then looked heavily away again.

That night when the orderly was dozing and the night nurse was going on her round from hut to hut, he tore the bandage from his head. She found him with his head oozing on the pillow, and scolded him roundly. He didn't answer. He said nothing. He seemed not to notice. Meekly, docile as a friendly trusting dog, he let her bandage him up again, and the next morning I found him again sitting up in his bed in his clean head bandage staring in front of him with that dark look of dumb subhuman suffering. And the next night the same thing happened, and the next, and the next. Every night he tore off his bandage, and then let himself be tied up again.

"If his wound becomes infected he'll die", said Monsieur X angrily.

"That's what he's trying to do", I answered. "Kill himself again before they can shoot him", I added, "to save them the trouble".

I dared not speak to the man whom I thought of day and night as Rosa, having never learned his name, and he never spoke to me or anyone. His eyes, which he now always turned on me when I came in, forbade me to speak to him. They stared into mine with the understanding of a brute mortally wounded, who is not allowed to die, so I went to the General, and, actuated by some hysterical impulse, pleaded for the man's life.

"But, Madame, we have epidemics of suicide in the trenches. Panic seizes the men. They blow their brains out in a panic. Unless the penalty is what it is—to be court-martialed and shot—the thing would spread. We'd find ourselves going over the top with battalions of dead men. The same penalty applies to men who wound themselves. That's the favourite device of a coward. He puts the muzzle of his rifle on his foot and fires."

I argued. I explained that this man was not afraid of being killed, but of not being killed, that his luck was out when the enemy missed him; that he had been kept waiting too long, had shot himself in despair because the Germans wouldn't shoot him; and a woman called Rosa let him down, or perhaps she died. Perhaps he simply wanted to go to her.

"He must have had a letter in the trenches—a letter from Rosa or about her. He's not a young man. He is forty or more—an enormous brute with red hair and hands like hams. A farmer probably. One of those slow plodding gentle brute men, faithful as dogs. His voice was broken-hearted, high and hollow like a child's voice, when he called to her. Like a child that is lost. "Rosa! Rosa!" If you'd heard him. And here you are with your military regulations asking me to save him for you so that you can shoot him. You expect us to tie up his head every night and prevent his dying so that you can march him off to trial and stand him up against a wall.

But what was the good of arguing against army regulations? We were at war. The General could do nothing. The man must be made an example, so that these epidemics of suicide could be kept in check. I didn't dare go back to Rosa. I went to the door of the hut and called the nurse. Down in the centre of the long row of beds I could see Rosa's great shoulders and his huge bandaged head. He looked like a monstrous baby in his white bonnet and pink flannel shirt. But I knew that his big haggard eyes were staring, and I remembered that his face had been a little paler each day, that it was not brick colour any more, but the colour of wax, that his cheek bones stood out like shelves.

He's killing himself in spite of us all, I thought. He's succeeding. It's hard work, it takes patience, but he's doing it. Given a chance, he'll pull it off. Well, he'll have his chance. I almost laughed. I had been a fool to go to the General and plead for his life. That was the last thing he wanted me to do for him. That was just the wrong thing.

I spoke to the nurse who was going on duty for the night. "When Rosa pulls off his bandage tonight, leave it off", I said abruptly. She looked at me a minute, hesitating. She was highly trained. Her traditions, her professional conscience, the honour of her calling loomed for a moment before her, then her eyes lighted. "All right", she said.

I thought when I stood at the foot of Rosa's bed next morning and found him staring at me that I detected a look of recognition in his eyes, perhaps even a faint look of gratitude, but I could not be sure. His gaze was so sombre, so deep, that I could not read it, but I could see that he was weaker. Perhaps it was his increased pallor that made his eyes so enormously dark and mysterious. Toward evening he grew delirious, but he tore off his bandage all the same, in the middle of the night. He managed to do that. It was his last effort, his last fumbling desperate and determined act. His fixed idea prevailed through his delirium, his will triumphed. It was enough. He was unconscious next morning and he died two days later, calling in his weary abysmal heart for Rosa, though we could not hear him.

Originally published in "Nurses at the Front: Writing the Wounds of the Great War", Doubleday Press.

TREATED LIKE FLOWERS

THE INDIAN ARMY AT THE ROYAL PAVILION HOSPITAL, BRIGHTON, 1914–1916

Kate Forde and Lucy Shanahan

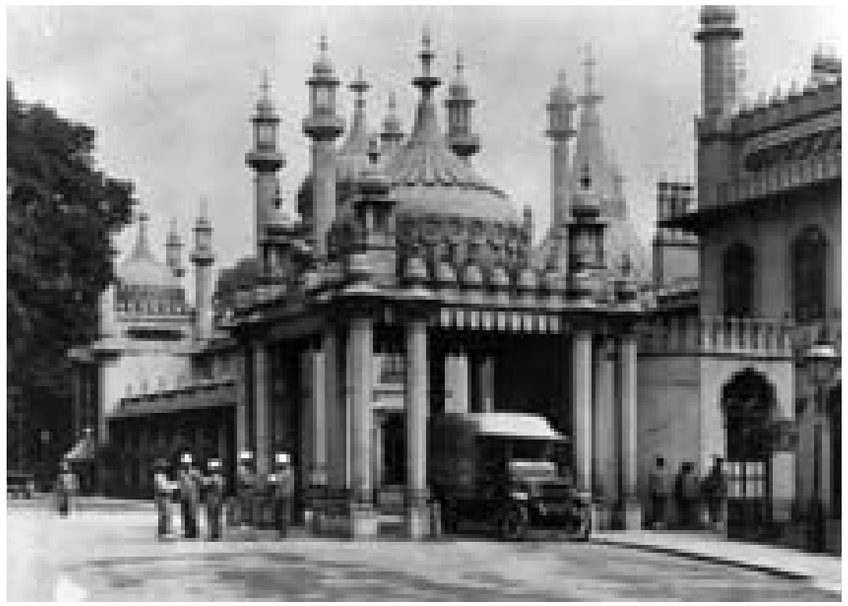
The Indians have come. Ever since the news of their intended coming was first published all Brighton has been agog to see the arrival of the warriors from the east who have been shedding their blood in the defence of the British Empire to which they belong.[1]

On 5 December 1914, the residents of Brighton caught their first glimpse of wounded Indian soldiers evacuated from the western front. The arrival of these "exotic Sons of the east", among them Sikhs, Punjabis, Bengalis, Pathans and Gurkhas, had been much anticipated since the Corporation of Brighton had announced that they were to be nursed back to fitness in the British seaside town, long renowned as a health resort and leisure destination.

The initial disembarkation of Indian soldiers generated much curiosity and excitement amongst the local community:

> As the train steamed into the station you saw their heads craning out of every window. Imagine a train out of every window of which stretched a glowing dark face, with bright eyes and shining teeth, bearded and turbaned! Think of that line of khaki *puggarrees* (turbans). There was something comic as there was something romantic, in the sight.[2]

Record numbers of newspapers featuring the reports of their arrival were sold and several reprints were required to meet the unprecedented demand. It was not simply the presence of these foreign heroes on British soil that so captured local attention, but the fact that, at the request of the King and Emperor George V, hundreds of them were to be cared for in the magnificent setting of the Royal Pavilion—that grand icon of Brighton. Commissioned in 1815 by the Prince Regent (later King George IV), the Pavilion was transformed by the architect John Nash, together with Frederick Crace and Robert Jones, from a Palladian villa into an architectural extravagance of domes, minarets, balconies and pagodas in the Indo-Saracenic style.[3] To contemporary observers, this building seemed an authentic and irresistibly theatrical location for the unfolding of a brief but remarkable chapter in Brighton's history. As one journalist put it "the Oriental Pavilion is emphatically now the abode of Oriental people".[4]



Ambulance outside the front entrance of the Royal Pavilion, Brighton.
Collection of the Royal Pavillion and Museums, Brighton.

From December 1914 to January 1916, over 2,200 members of the Indian Army were treated for war-related injuries in Brighton. The following chapter is only a partial account of that time, inspired by the compelling photographic material and contemporary newspaper reports housed in the archive of Brighton History Centre at Brighton Museum and Art Gallery. The very existence of this material suggests an awareness of medicine as spectacle, and a belief in its power during wartime to inspire troops and civilians alike. It is important to highlight the fact that these photographs were commissioned for an official guidebook and as a series of postcards published to mark the opening of the hospital as a sight-seeing venue for the public in 1916.[5] In other words, they were not conceived as formal portraits but sold as mass-produced souvenirs. In the pre-electronic age, postcards were the economic mainstay of Europe's vast and diverse printing industry, and immensely popular. During the First World War they played an important role not only in facilitating the exchange of human emotion, but also in the effort to represent the war in propagandist terms. The individuals featured in these images were not named, identified and sealed in albums or frames; nor would their personal histories have been reconstructed in the language of family anecdote. Instead, their stories were collapsed into a grand narrative that sought to highlight Britain's military might by connecting its imperial legacy with its new role in the Great War.

When Indian reinforcements were mobilised to join the war in September 1914, it was the first time that the Indian Army had been required to fight in Europe. They were initially destined for Egypt, but were diverted at the last minute to Flanders, where back-up forces were urgently needed. As a result, they were poorly provisioned and not acclimatised to the punishing winter weather, equipped only with lightweight khaki uniforms intended for the North African climate. Propelled into some of the most violent fighting near Ypres in November and December, the Indian Army suffered heavy losses.

Pavilion grounds, Dome in background.
Collection of the Royal Pavillion and Museums, Brighton.

Meanwhile, they were subjected to relentless rain and bitter cold, which resulted in many cases of frostbite, trench foot and gangrene, in addition to the innumerable injuries caused by machine-gun fire and high explosives. To compound their suffering, many of the Indians were afflicted by the added hazard of unfamiliar European diseases such as measles, mumps and influenza. There was also the risk of contracting bronchitis and pneumonia as a result of being exposed to the damp and cold of the trenches for extended periods of time. The Indians were heavily involved in the ambitious attack at Neuve-Chapelle, the main British-Indian sector on the Western Front, and were amongst those exposed to (and unprotected from) poison gas when it was used for the first time by the Germans in May 1915. Shocked and unprepared for carnage on such a scale, one man wrote home: "This is not war; it is the ending of the world."[6]

Despite this, there was an ardently powerful sense of allegiance and personal duty to George V amongst the Indian troops, who frequently mentioned him in their letters; a royal message or visit was considered to be a great event. Much of this loyalty may be attributed to an acquiescence derived from the long-standing legacy of British reign in India. Additionally, the British had gone to great lengths to convince the Indian people that the war was also their war—or the "defence of their hearths and homes".[7] This included employing incentive tactics such as promises of valuable land to Indian officers and men who demonstrated the greatest valour or *izzat*—to bring honour to their family or caste by fighting bravely on the battlefield. One further motivation was the country's hope of attaining dominion status. To this end, Mahatma Gandhi, as leader of the Indian National Congress, openly supported the British war efforts and actively encouraged Indians to enlist in the army and to contribute to the war fund.

It had originally been planned that wounded Indian soldiers would be hospitalised in France, but the number of casualties escalated to such an extent that alternative arrangements had to be made. In November 1914, the Royal Pavilion was closed to the public and taken over by the War Office.[8] The task of adapting the buildings for medical purposes was undertaken with great

Indian soldiers gathered in beds in the Dome, Brighton.
Collection of the Royal Pavillion and Museums, Brighton.

celerity and drew extensively on local resources and manpower. Completing the job in less than a week, Brightonians were justifiably proud of this unique achievement: "It is surely the most perfectly arranged hospital of its kind, which has ever been established in this or any other country."[9]

George V, a man reputedly more interested in stamps than in art, seems nonetheless to have understood the Pavilion's power and to have appreciated the intrinsic theatricality of the opportunity presented to him.[10] The Royal Pavilion, an architectural fantasy that had reflected George IV's nostalgia for absolute monarchy by linking it to the growth of Britain's empire in the East, was the perfect stage on which to re-inforce the idea of colonial power in the twentieth century. The professed reason for renovating the Pavilion was that its luxurious eastern decoration would have a positive impact on the soldiers' recuperation. As one member of the War Office explained, it would "have an effect on their minds beyond ordinary English comprehension". But another reason can be gleaned from his next comment: "They will write letters home, telling of the magnificent place where they are being cared for, and the news will spread throughout India and do an immense amount of good."[11] This suggests an attempt to re-emphasise colonial ties by promoting the high standard of medical care granted to Britain's allies. It was felt that this might assuage the potential for resentment amongst the Indian civilian population, whose husbands, sons, fathers and brothers were obligated under Imperial rule to risk their lives in a disconnected war for a remote cause in a remote country. As part of this same effort, 20,000 copies of the

Royal Pavilion Operating Theatre. Collection of the Royal Pavillion and Museums, Brighton.

commemorative guidebook in English, Gurmurkhi and Urdu were secured for distribution in India.[12]

The Pavilion, together with the nearby Dome and the Corn Exchange, provided 724 beds. The Drawing Rooms, Saloon, Music Room and Banqueting Room as well as the Dome were all used as wards, while the smaller rooms functioned as isolation rooms or offices. All wards were mixed, with different religions and castes sharing the facilities, although separate wards were set aside for officers.

Although the majority of cases were gunshot wounds, owing to the recent introduction of the high-velocity bullet, a wide range of conditions were treated, particularly those caused by the effects of explosives to the lower and upper extremities as well as gas-poisoning, gangrene and psychological trauma. In order to carry out the necessary surgical procedures, two operating theatres were installed at the Pavilion, one in the Prince Regent's kitchen and one in the Church Street entrance to the Dome, which also had an X-ray room attached.

Recent developments in the practice of anaesthesia meant that it was possible to explore wounds more thoroughly. This required vast quantities of dressings, which were very expensive and consequently led to improvised substitutes. These included sawdust pads and dressings made of muslin-covered Sphagnum Moss, a plant that had been used in this way for centuries due to its absorptive and extremely acidic nature, inhibiting the growth of bacteria and fungi. Other modern innovations provided at Brighton were radiant-heat baths and various electrotherapy treatments believed to help stimulate the nerves and muscles, particularly in cases of paralysis.

Contemporary documents record how every effort was made to ensure that the provisions being made to accommodate different faiths in the field were extended and strictly adhered to in the Pavilion Hospital. This included separate water taps for Hindus and Muslims in each ward; segregated bathing houses and latrines; nine kitchens providing discrete cooking and washing-up facilities for Muslims, meat-eating Hindus and vegetarians, and special arrangements for the ritual killing and storing of meat.

Royal Pavilion Kitchen. Collection of the Royal Pavillion and Museums, Brighton.

All notices were printed in Urdu, Hindi and Gurmukhi. Special areas were designated for religious worship, with lawns being allocated to the Sikhs and the Muslims on the grass plot in front of the Dome, facing Mecca. Separate mortuaries and particular funeral rites were also observed; Hindus and Sikhs were cremated on the Downs, the site now occupied by the Chattri, an Indian memorial to the dead.

Initially, once the Indian soldiers had arrived at Brighton there was—for one journalist at least—frustratingly little to be seen of them: "Every possible entrance to the Pavilion grounds is guarded by the police, and sometimes by the military, while carpenters have been busy all the week boarding up all possible crevices where the curious public may possibly peer in ... Most of us feel that the town deserves a little more spectacle for its money."[13] Over the course of the year during which the soldiers underwent treatment at Brighton, this appetite for spectacle was fed by numerous descriptions, illustrations and photographs of the luxuriously equipped medical facilities and wards, as well as images of the Indians resting in the Pavilion gardens and promenading along the sea-front.

Numerous articles acquainted readers with "these faithful dusky warriors of King George" by offering details of their military tactics, forms of religious worship, and food and drink requirements.[14] Finally, during the first week of February 1916, and after the majority of the patients had been discharged, the Pavilion was opened to the public so that they might inspect how the state apartments had been renovated to accommodate the foreign visitors. By 9 February there had been over 10,000 visitors.

With its wildly imaginative combinations of Chinese, Indian, Gothic and neoclassical elements, the Pavilion is a superlative example of nineteenth century architectural 'Orientalism'.[15] In the context of the First World War, the decision to reinvent the Pavilion as a military hospital for Indian soldiers has significant political symbolism. Representations of the Pavilion from this time seem to offer 'proof' of Britain's supremacy, its ability to civilise and conquer through supposedly enlightened

Above
Convalescent Sikhs.
Collection of the
Royal Pavillion and }
Museums, Brighton.

Below
Convalescent Dogras.
Collection of the
Royal Pavillion and
Museums, Brighton.

colonial rule, its beneficence towards its occupied nations, and its commitment to the practice of modern medicine.

The postcards produced to document the Indian soldiers' recuperation at Brighton served as tokens to remind those who purchased them of their visit to the transformed pavilion. Whether they remained in their owners' safe-keeping or were posted to distant addresses, these souvenirs functioned as fragments of authentic experience, providing an opportunity for people to possess some tiny aspect of the original encounter.[16]

It is interesting to note a certain rhetoric of power that haunts these images. In one exterior shot, an ambulance is parked directly beneath the onion dome of Nash's entrance porch, while a few Indian patients stand aside on the driveway (see page 89). The vehicle is the focal point of this image, its undecorated bulk asserting itself against the elegant proportions of the architecture, dwarfing the graceful minarets and causing the structure to appear even more fantastical. The ambulance fits perfectly however, almost as if it had been designed to occupy this space—a potent symbol of modernity gesturing towards Britain's superiority as a medical as much as a military power. The images of the pavilion interiors are similarly incongruous: the steel-framed hospital beds with their white sheets float beneath the great vault of the Dome, illuminated by the sparkle of gigantic chandeliers and the coloured glass set into the roof.

There is an atmosphere of medical austerity contrasting with opulence, a pleasure palace newly concerned with pain. For the viewer, one of the intended consequences of seeing such images is to marvel at the unseen power, namely Britain's military authorities, which had brought about such a metamorphosis.

Royal Pavilion
Ward Three, Saloon.
Collection of the
Royal Pavillion and
Museums, Brighton.

Hospitals require a surrendering up of the patient's body to the enlightened practice of modern, usually western, medicine. In the case of the Indian army at Brighton, this submission is even more problematic because the convalescing bodies of the soldiers represent not only the individual's surrender but the subjugation of one nation to another, by armed force.

Seven of the postcards in the collection at Brighton present the various ethnic groups who fought alongside the British: 'Punjaubi mahommedans', 'Jats', 'Gurkhars', 'Pathans', 'Sikhs' and 'Dogras'.

Photographed in groups of around 12, they stand or sit somewhat stiffly in the pastoral setting of the pavilion gardens. Wearing hospital blues and turbans, some with bandaged limbs or using crutches, they are assembled as elements of a picturesque collection, representatives of their country. The photographer has been careful to frame these men within the massive sculpted pillars of the Pavilion and to create pleasing symmetrical compositions. Unlike so many images of wounded men from this period it is not a sense of tragic loss that is foregrounded here; there are no truncated limbs, awkward prostheses or facial deformities obviously on display. Instead, it is the idea of a 'noble race' that is being brought sharply into focus.

From a historical perspective these postcards refer to a language of scientific or anthropological portraiture originating in the daguerreotype era, withWestern photographers training their cameras on native people in order to construct a sense of the 'exotic'. However, partly because of the undiscriminating nature of photographic technology itself, the images of the Indian soldiers do not simply work as reflections of colonialist principles. The randomness captured in these photos, the light falling on a particular corner of the room for instance, or the enigmatic expressions of the patients, should permit a more complex interpretation of this material.[17]

Nonetheless, it is apparent that the ideology of empire is at work both in these photographs and in the paternalistic tone of Brighton's local press with its repeated references to "our Indians". Perhaps unsurprisingly it is the soldiers' bodies that often become central to contemporary reports:

Royal Pavilion Ward Five, Music Room, after the Indians had been discharged. Collection of the Royal Pavillion and Museums, Brighton.

> They are good patients, these Indians: they lie quite passive, and but for their open eyes one could have imagined them lifeless. Of the hundred men who were brought across the platform only two or three, by some contraction of the forehead or twitching of the lips showed signs of pain.[18]

It was a convention of the time when writing about the plight of wounded soldiers to praise their enduring stoicism; however, given the unique position of the Indians as foreign subjects fighting for a British cause, the reference to their valour is undermined by the description of their submissiveness.

The central yet ambiguous place of the Indian army within Britain's colonial order has been discussed by historian David Omissi, who points out that in 1857 the British had been almost driven from the subcontinent by the rebellion of their Indian troops. He explains that "because of the essential yet potentially dangerous role of the Indian forces in colonial India their activities were more closely scrutinised and more carefully recorded than those of most other elements of the indigenous population."[19] This scrutiny, as we have seen, extended to the troops convalescing at Brighton, both informally, through the local press, and through the more formal path of the censor, who translated and passed (or rejected) thousands of letters that the Indian soldiers wrote home from Brighton and many other military hospitals in Britain:

> Do not be anxious about me. We are very well looked after. White soldiers are always besides our beds—day and night. We get very good food four times a day. We also get milk. Our hospital is in the place where the King used to have his throne. Every man is washed once in hot water. The King has given strict order that no trouble be given to any black man in hospital. Men in hospital are treated like flowers, and the King and Queen sometimes come to visit them.[20]

The existence of these letters, however compromised, together with the ambiguities they present, contributes towards a more nuanced version of this episode than is communicated by the fervent nationalism of the contemporary reports or the silent images. These are stories from the other side of the photographs and warrant a much longer discussion than is possible here.

The wealth of information that was generated about the Indians' year-long stay in Brighton illustrates a common belief that knowledge of foreign cultures was a demonstration of, and route to, enlightened colonial rule. Victorian ethnographic collections, such as Henry Wellcome's Historical Medical Museum, were a manifestation of this attitude. Wellcome himself stated that "the man who understands native peoples and their habits, customs, superstitions, their beliefs, and fears, has an enormous advantage over the man who does not".[21] The staging of events in Brighton, together with the visual and written accounts that ensued, offered an elaborate demonstration of familiarity with Indian life and customs, at the same time as accommodating them within a definitively British framework. This was an example of the 'knowledge' that underpinned imperial dominance and became the mode by which the Indians were persuaded to know themselves: as subordinated to Britain.

It is notable that this attempt to re-inforce the United Kingdom's sense of itself as a colonial power occurred at the very point when that power seemed most under threat. With no end to the war in sight, and with British and French casualties outnumbering German, Britain's authority was being seriously undermined. With the 1857 Indian rebellion still in living memory it is clear that the decision to turn Brighton Pavilion into a military hospital was at least partly an exercise in nostalgia, permitting a wistful glance backwards at Britain's historic influence over India. But the decision also implies a sense of nationalistic bravado masking a degree of disquiet about the course of contemporary events. The arguments made in favour of treating the Indians at Brighton concentrated on the advantages of accommodating them in an authentically 'Eastern' royal palace. They did not need to make explicit that this episode was actually part of a therapeutic strategy designed to restore the morale of the nation at a critical time.

Percy Hennell
PORTRAITS

The following photographs of patients before and after various stages of plastic surgery were taken by Percy Hennell between 1939 and 1945 using a remarkable technique that involved the superimposition of three layers of film. The light-fast colour has not faded in 60 years.

Photographs courtesy the Antony Wallace Archive of the British Association of Plastic Reconstructive and Aesthetic Surgery (BAPRAS).

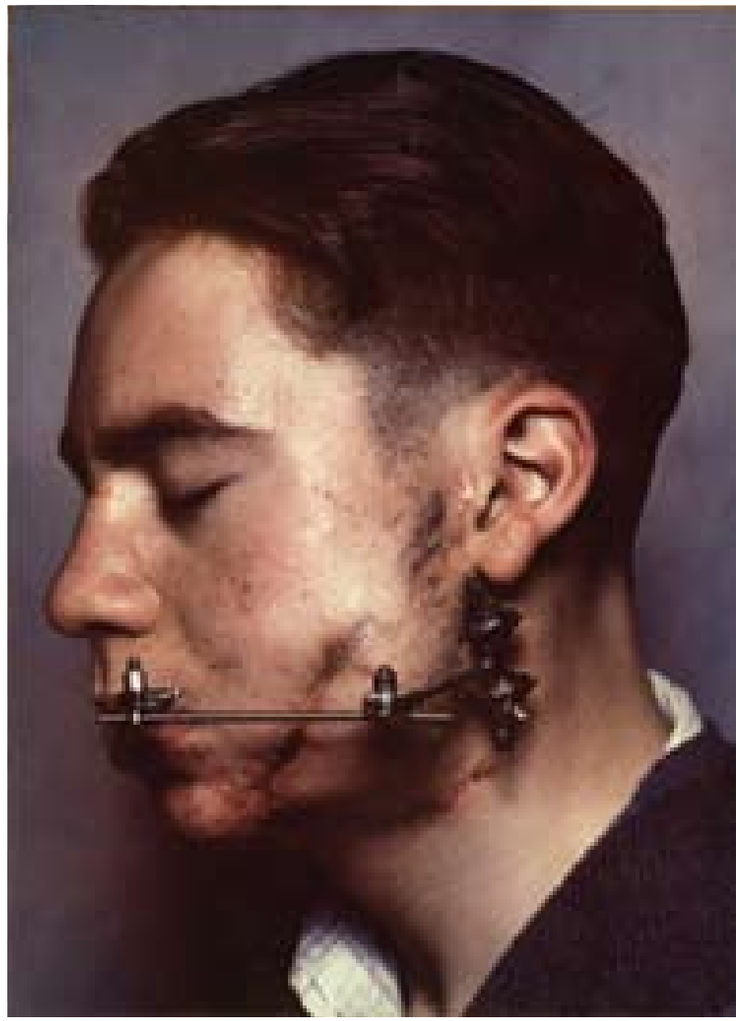
The right forehead shows the result of reconstructive surgery. A head injury and surgery had left a depression, which has been filled out with a graft.

The left eye and surrounding flesh was lost in a war wound. The flesh has been reconstructed with a flap of skin taken from the scalp. The bandage covers the donor area. A further surgical procedure will be needed to complete the repair.

A wound to the right jaw has damaged the lower branches of the facial nerve. The right lower lip is paralysed.

Severe burns to the neck resulted in scarring that almost fixed the chin to the chest. The scarring has been removed and new skin and flesh has been grafted from the patient's stomach.

An airman with healing, partial-thickness burns to the face. The rest of the head was protected by his helmet.



The left side of the jaw is fractured and the flesh above it is wounded. External fixation with pins and a dental appliance have been used to immobilise the fracture.

Scarring of the face from burns. The eyelids are deformed by the scarring and the sight is endangered.

Fracture of the facial bones and burns.

SUFFERING AND THE HEALING PROFESSION

THE EXPERIENCE OF MILITARY MEDICINE IN THE FIRST AND SECOND WORLD WARS

Joanna Bourke

Richard Caton Woodwille, When Night Sets in The Sun is Down, 1910s.
Wellcome Library, London.

MILITARISED MEDICINE

In 1916, the night before joining the army, Wilfred Willett held his weeping wife in bed and wondered, "Should I ever sleep with her again? or should I be limbless or faceless next time? I would meet her in heaven but in what state?"[1] War threatened major devastation upon the male body and Willett's fears of physical disintegration were shared by millions of men during wartime. The so-called healing profession was charged with inspecting and assessing new soldiers such as Willett and then taking care of their physical and mental well-being during their time of service. Willett survived his war (barely), as did Lieutenant Arthur E Kaye, though he found himself severely injured in hospital during the First World War. On his behalf, a nurse wrote the following letter to Kaye's mother:

> Your son Lieut Kay [sic] asked me to write to you & tell you the worst—poor boy he has had his left Eye knocked out—& his right leg Amputated, he is very ill indeed, beside the Eye & leg his jaw is fractured, so you see how very ill he must be. He wishes me to write & tell you all, because he said he could not do it. he says he cannot come back to his Wife like that, but I tell him you will be glad to see him anyhow … He worries so much about things.[2]

Such anxieties and torments would not vanish with any armistice.

The First and Second World Wars threatened major devastation upon male and female bodies, propelling the medical services into the forefront of the warring enterprise. Every person who signed up would have had contact with the medical services, even if only during the process of recruitment and during the regular medical inspections. For a significant minority, contact with the medical branch of the military was more extensive. During the Second World War, for instance, over a thousand British medical units were mobilised and British medical services attended to five million patients. The dead were beyond help, but the hundreds of thousands of British servicemen and women who were physically dismembered or psychologically fractured found

"Nurses and midwives are needed. The wartime job that can be your career." Second World War, poster.
Wellcome Library, London

themselves dependent on the physicians, nurses and a wide variety of other medical personnel.

Nothing in British history (neither nineteenth century wars nor the grim injuries perpetrated upon the human body within factories or mines) was adequate preparation for the physical devastation of the two world wars. All parts of the body were at risk: head, shoulder, arm, chest, intestines, buttock, penis, leg, foot. Over 41,000 men had their limbs amputated during the First World War. Thousands more suffered severe injuries to the arms or legs that

Patient with many wounds, 1916.
Photograph by Albert Norman, Wellcome Library, London.

did not require amputation. In some sectors of war, diseases had a more devastating impact than wounds. Over half of soldiers who died in Macedonia and Italy during the First World War, for instance, were admitted with illnesses as opposed to wounds. This was in contrast to the situation in France, where only ten per cent of soldiers who died had been admitted to hospital suffering from illness. Just before the Second World War, 222,000 officers and over 419,000 servicemen in other ranks were still being paid disability pensions for either wounds or illnesses contracted during their time in service. An unknown number were still suffering from the nightmares and 'shakes' of shellshock.

Who were the physicians responsible for the medical well-being of men and women serving in British forces? During both world wars, the Royal Army Medical Corps (established in 1898), along with various nursing services, were primarily responsible for the medical care of military personnel. The structure of their provisions was simple. Carefully delineated 'routes' of medical help were formalised during the First World War, with Regimental Medical Officers accompanying the fighters and setting up Field Ambulance or Dressing Stations (really First Aid posts) a short distance behind the front lines. This was where stretcher-bearers took the battle-wounded for immediate, emergency treatment. From the clearing stations, men would be transported to General Hospitals at some distance from the fighting. The most important change during the Second World War was that these routes became more flexible, and extremely mobile units were introduced, allowing surgical teams to operate closer to the front lines.

Medical officers were not only responsible for men in combat zones. Their job was inextricably linked up with military administration. In addition to ministering to urgent surgical and medical needs, they also assessed the health and strength of recruits, held medical parades, examined feet and penises, and inspected sanitary facilities. Crucially, physicians were at the heart of the entire system of military discipline: their primary function was to return men to their military duties. In the words of John Rawlings Rees, member of the Directorate of Army

A field ambulance behind the firing line. Field surgery in the Dardanelles. 1915, Captain J Pearson.
Wellcome Library, London

Psychiatry during the Second World War, "The medical officer in the army has to think in terms of groups and group welfare rather than of the individual patient."[3] Like other military officers, medical personnel in wartime feared the consequences of indiscipline. Thus, reflecting on his service during both the world wars, medical officer Charles Huxtable mused that: "Sometimes, I have pangs of remorse, but it doesn't do to dwell on past mistakes. If you relax and give favours to one man, there may be a flood of others".[4] Medical officers tended not to question the right of their military superiors to command the men as they saw fit. As Sigmund Freud put it, war-time physicians "had to play a role somewhat like that of a machine gun behind the front line, that of driving back those who fled. Certainly, this was the intent of the war administration".[5]

SURGERY AND ITS DISCONTENTS

The first priority, though, was to deal with the immediate effect of those machine guns, shrapnel, poisonous gases and other weapons of destruction upon fragile tissue and bones. The risk of physical mutilation was not identical in all fields of war. During the First World War, for instance, the risk of infection was much higher in France than elsewhere, and medical officers rapidly learnt to treat every wound as septic. It wasn't until the Second World War that the new age of antibiotics dramatically reduced death rates through infection. Penicillin was invented by Alexander Fleming in 1928, but it took until 1943 for the drug to be mass produced. Blood transfusions were also being used on a mass scale by that date. Clearly, delays in obtaining medical help also increased risk of severe mutilation or death. On the Western Front during the First World War, a wounded soldier typically took between eight and twelve hours to reach a Casualty Clearing Station and, at Gallipoli, soldiers might face a voyage of two to three days before being admitted to hospital. As Major Stanley Argyle lamented in his diary in May 1915, "Is it any wonder that many limbs are amputated and some lives lost that would otherwise have been saved?"[6] In contrast, by the Second World War, one-fifth of soldiers were operated on within six hours of being wounded and

Advance dressing station in the field, First World War.
Wellcome Library, London

nearly half within another six hours. As a consequence, fewer than five per cent died of their wounds.[7]

Physicians and nurses faced formidable problems in dealing with the number of casualties on the front lines. Unhygienic equipment, poor lighting, the scarcity of water, and the short supply of operating instruments, needles, ligatures, supports and crutches severely lowered standards of medical care. The eminent surgeon Dr Alexander MacCormick was said to have despaired over the "filth, sepsis, pus-running sinuses" of war wounds and the fact that he was unable to operate on "clean, unbroken flesh". He candidly admitted that he relished making incisions through unblemished skin; the torn and filthy wounds of battle were not to his taste. The "neat techniques" in which the "aesthetic result" was paramount had to be rejected in favour of "crude unfinished ways".[8] Surgeons who failed to adapt to wartime contingencies were pronouncing a death sentence on their patients. Even with the more mobile surgical units of the Second World War, speed was paramount, sometimes making

Blood transfusion.
Wellcome Library, London

Wounded soldiers on stretchers eating a meal, 1940s.
Wellcome Library, London

it more sensible to amputate limbs than to attempt complex and time-consuming procedures. As one commanding officer informed a surgeon who seemed determined to invest slightly more time in operating in order to avoid having to amputate a limb, "If I give you time, I've got three men out here on the floor who will die and maybe this one will die too. He's better without a leg than all of them should be dead".[9]

Survival was paramount, but medical responsibilities did not stop when the wounded left the wards. They faced long periods of recuperation in hospitals and local clinics. Artificial limbs had to be fitted; vigorous health, regained. No-one expected that the wounded would return to physical—let alone psychological—health quickly. In the early days of both the First and Second World Wars, the war-wounded were spoken about in patriotic and sentimental tones. Typically, on 20 April 1941, the Central Council for the Care of Cripples broadcast an appeal for people to give money to help those men, women and children wounded in battle or during the Blitz. It told the story of a limbless soldier who fretted about whether he would end up "left behind on the street corner selling matches". "Those honest worried eyes of Thomas Jones" were "looking at me; they are looking at you", the appeal began:

> And around and beyond his bed, as far as vision can reach, there are thousands of other beds; thousands of other eyes, honest and worried. War cripples—soldiers, sailors, our men, women of the services, munition workers, children of the Home Front … Not begging—they are too brave to beg; just wondering … Are we going to get that treatment? And what about employment, without which the human spirit sinks from self-respect into the darkness of bitter despair?[10]

Public rhetoric judged soldiers' mutilations to be "badges of their courage, the hall-mark of their glorious service, their proof of patriotism", as *Help for Wounded Heroes*, 1920, put it.[11] The disabled soldier was "not less but more of a man", the *Liverpool Chronicle* crooned.[12] Time and again, the mass media claimed that "broken warriors" deserved reverence.

This sentimentalisation of the war-dismembered did not last. Those

Three wounded soldiers, 1940s.
Wellcome Library, London

who remained in hospital after the war found that many of the privileges they had enjoyed before the Armistice were removed. A navy man who was crippled as a result of war service, complained:

> The hospitals had many patriotic visitors and supporters during the years of the war, when the nation was in peril, but since the Armistice this band had dwindled down to just a few. Many of those people who during the war, visited the hospitals with gifts, and took the men out for long drives, and to entertainments, gave up—at the signing of the Armistice—what they were pleased to call their 'war-work'.[13]

Even the main charities devoted to the care of disabled people began warning their donors that too much attention was being paid to the war-maimed. As early as 1941, one charity insisted that: "The person, and in particular the child, who is threatened with crippling as a result of accident, of tuberculosis, or infantile paralysis, or other illness is every bit as important as the person or the child who is injured by a German bomb".[14] After both wars, this sentiment gained dramatically in strength. With the distaste for soldiering following the war, the heroic image of the war-disabled on the field of battle came to lose its potency. They were portrayed as both child-like victims *and* prematurely aged. In either case, they were useless in the face of the growing post-war needs to restore the economy. In the words of Harry Smith, a character in a play called *The Unknown Warrior,* 1923, who had been given a job making toys: "I'm fed up with making silly toys. It's not work for a man—but we're not men now, with half our insides and half our limbs gone; it's a good enough job for us, I suppose".[15]

THE SHELLSHOCKED

Second only to the public anxiety about wartime dismemberment was the concern expressed about mental collapse, whether called 'shellshock', 'war neurosis', 'hysteria', or 'combat exhaustion'. For many British soldiers, the traumas of combat were almost unspeakable. "My nerves are shook up, severe head-ache now and again when my mind is on the affair", is how Private Arthur Hubbard described his psychological crisis in a letter to his mother in July 1916. His breakdown was triggered by being ordered to slaughter brutally three unarmed German prisoners who had "cried for mercy". It made his "head jump", he sighed.[16] Other men found that their days as well as nights were tormented with nightmares. In the words of a young officer known only as 'Captain B':

> The chief trouble now is dreams—not exactly dreams, either, but right in the middle of an ordinary conversation the face of a Boche that I have bayoneted comes sharply into view, or I see the man whose head one of our boys took off by a blow on the back of his neck with a bolo knife, and the blood spurted high in the air before the body fell. And the horrible smells! You know I can hardly see meat come on the table.[17]

Private E Lucas also described his sense of enduring horror. In a halting, distressed paragraph scrawled in a nurse's scrapbook, he described (with almost no punctuation):

> showers of lead flying about and big big shells its an unearthly sight to see them drop in amongst human beings. The cries are terrible, I escaped being hit but… got buried once that caused me to have fits… and trip to France is nice but not when the murderers are killing anyone children included, and destroys Churches May the Lord put an unholy curse on them for ever and ever The sights cannot cannot be explained in writing. Writing is not my line. No fighting either. For they that wants to let them fight Because I will never like it no no never.[18]

No one really knows how many men experienced long-term terror like Privates Hubbard and Lucas or

Captain B Poor psychiatric training and the hurried nature of diagnosis in wartime conditions dampened enthusiasm for accurate record-keeping. The statistics were also skewed by variations in nomenclature (a headache might be labelled 'combat exhaustion', 'concussion', or 'malingering'), differences in evacuation procedures (for instance, a sudden increase in cases of trench foot might cause wholesale eviction of psychiatric patients from the hospital), and the presence of a wound in addition to emotional collapse (in which case, the wound would take precedence). Decisions were also made with pension requirements in mind. The psychoanalyst William Needle, who served during the Second World War, recalled being bewildered by the pressures placed upon him to diagnose men suffering from war neuroses as "constitutional psychopaths". The reasons for this were many, he discovered, but "fear about the national debt" was "uppermost". After all, his colleagues argued: "why qualify a man for pension rights by attaching the label of neurosis to him when the facts indicate that his symptoms are of life-long duration? Why not designate him constitutional psychopathic state, which rules out compensation?"[19] In other words, military psychiatrists made their diagnoses with economic and administrative repercussions firmly in mind.

What were doctors to do, then? The first thing psychiatrists and other physicians were required to do was 'screen' recruits thought to be susceptible to breakdown. The list of men who should not be allowed to enlist included such diverse groups as epileptics, homosexuals and those suffering from venereal disease, to those with a history of insanity in their family, men frightened by trains, and men incapable of micturating in public.[20] Undeniably, though, the chief screening device consisted of ensuring that people who had a "neuropathic or psychopathic soil" were identified.[21] Clinical psychologists had a duty to ensure that men with a dubious psychiatric family history were identified and excluded from military service.

Despite these procedures, it was clear that large numbers of men were being rendered militarily useless due to psychiatric breakdown. Overall, around 25 per cent of all discharges during the 1914–1918 war and

Field dressing; bandaging the wounded, First World War.
Wellcome Library, London

between 20 and 50 per cent during the 1939–1945 war were labelled "psychiatric casualties". The military services realised that something had to be done—and quickly—to reduce levels of psychiatric breakdown. As a result, clinical psychology received a significant boost. In 1916, the first Consultant Psychologist was appointed to accompany the Consultant Neurologist with the British Expeditionary Force. Unfortunately, by the time of the 1939–1945 war, the lessons learnt in the earlier conflict had been forgotten: it took until the middle of the war for the psychiatric services available to the armed forces to be adequate again.

The purpose of treatment was to restore the maximum number of hysterical and neurotic men to duty as quickly as possible. In the words of the author of "Psychiatric Activities During the Normandy Offensive, June 20–August 20, 1944" (1946), psychiatrists were not to concern themselves with 'cure', nor with solicitude for the psychic pain [the patient] would have to endure to serve a few more combat days, nor even with speculations on the eventual

Patients' recreation room, Second floor, King George V Military Hospital, Stamford Street, London.
Wellcome Library, London.

consequence to his personality. Military psychiatrists had only one aim and that was to determine whether a man retained "additional combat usefulness", the author concluded.[22]

There was considerable debate about how this was to be achieved, however. A medical officer called Charles Myers had coined the term 'shellshock' in 1917. Along with many other medical officers in the front lines at the time, Myers had assumed that shellshock was the result of a physical injury to the nerves arising out of incidents such as being buried alive or exposed to heavy bombardment. But, very quickly, it became obvious that everyone was at risk, including those who had never been anywhere near the front lines. As a consequence, medical officers increasingly began emphasising psychological factors (including simple 'exhaustion') as providing sufficient cause for breakdown.

This shift had inevitable consequences in terms of treatment. If breakdown was a 'paralysis of the nerves', then massage, rest, dietary regimes and electrical treatment were invoked. If it was the result of psychological trauma, then the 'talking cure' (especially group psychotherapy), hypnosis and rest would speed recovery. From 1942, Exhaustion Centres were set up, in addition to preventative policies such as limiting the amount of time a man spent in combat without rest-periods. Drugs (such as insulin, anti-depressants and tranquillisers) were also widely employed. In all instances, occupational training and the inculcation of 'masculinity' were regarded as essential. As the medical superintendent at Botham Park (York) put it in 1920,

Malingerer's guide, disguised as a book of matches, 1944.
Wellcome Library, London

although the medical officer should show sympathy, the patient "must be induced to face his illness in a manly way".[23] Treatment was summed up in terms of three principles: immediate treatment, continued proximity to the battle (based on the belief that the further men were removed from the fighting, the less chance that they could be transformed back into combatants), and constant reassurance of rapid healing. Either way, sufferers had no choice but to recognise the stigma of cowardice and acknowledge that their reputations as soldiers and men had been dealt a severe blow.

MALINGERING

One of the problems faced by medical officers was that they shared with other military officers the suspicion that men in mental wards were actually malingering. Most famously, during the Sicilian campaign in the Second World War, General George Patton visited a hospital where he met a man suffering from battle neurosis. In Patton's words:

> I said, 'You mean that you are malingering here?' He burst into tears and I immediately saw that he was an hysterical case. I, therefore, slapped him across the face … And told him to get up and join his unit, and make a man of himself, which he did. I am convinced … that, had other officers had the courage to do likewise, the shameful use of 'battle fatigue' as an excuse for cowardice would have been infinitely reduced.[24]

Not all medical officers shared this view, of course. As the more sympathetic author of *Men Without Guns,* 1945, patiently explained, "simulated psychoneurosis is really a form of the affliction. A man who is willing to be branded a neurotic—as having cracked—is, to a degree, neurotic." Someone who shoots himself "has reached what they call his emotional threshold".[25]

Nevertheless, one of the jobs of physicians within the military was exposing malingerers; indeed, as one army surgeon responded when asked if he was a doctor: "No … I am a detective".[26] After all, some men *did* malinger in order to escape combat. As Private Edward Casey (a Cockney serving with the Royal Dublin Fusiliers) admitted: "I started to scheme, how the hell can I work my ticket and get out of this bloody war … I admit I am a coward—a bloody, bleeding coward—and I want to be a live coward [rather] than a dead blasted hero". He faked madness. As a result, he also had to pretend to be hypnotised. In his words:

> The Doctor who put me to sleep, examined me again, I had to tell him everything I remembered before the barrage. Talking and telling him lies, while he wrote every word I spoke, in a book, telling me my complaint of shattered nerves was becoming very prevalent.

When he suspected that the doctors distrusted him, he stepped in front of a truck, crushing his foot.[27] Others simulated diseases or bought specimens of saliva containing tuberculous bacilli or small samples of gonorrhoeal discharges from their mates. Even more simply, a stick of cordite, extracted from a .303 rifle cartridge, would cause a high temperature and symptoms of an erratic heart condition if chewed. As the author of "Malingering—A Study", published in *The Military Surgeon* in 1941 lamented: "It is indeed devastating to recognize, as we must, that all men are not possessed of manhood, and that the 'yellow streak' down the backs of some of our fellows is invisible to the unaided human eye."[28]

Of course, patients were not passive; they often resisted attempts to

Opposite, above and right: Self-inflicted wounds, First World War, Lieutenant Colonel G J S Archer, RAMC.
Wellcome Library, London

castigate them as cowards or weaklings. Lieutenant AG May, for instance, refused to accept the slur of cowardice that he believed had been fixed to him with the diagnosis of shellshock. He had been shot during the Messines-Wyteschaete push and had been sent back to England. In his words:

> A few days later I started to have uncontrollable jerking and shaking of my legs. I was quite upset because I was unable to stop it. The doctor came and told me I had shellshock but I didn't believe this. That afternoon I was moved to a room by myself and this was not nearly as nice as being in a ward with six and eight other chaps.[29]

Freudian ideas in particular were thought to clothe the sufferer in a mantle of disgrace that had been absent when more somatic explanations were accepted. Pathologising emotional reactions to killing, and ascribing psychological weakness to men who disliked (or disapproved of) military life, made it even more difficult for combatants to discuss their experiences in war with their families and friends when they returned

The medical profession, however, invented signs by which the malingerer could be distinguished. They attempted to identify groups of men who were to be regarded as the most prone to dissimulate. This took many forms—including the sweeping assertion that particular ethnic groups (Irishmen and Lowland Scots) were untrustworthy. Doctors also speculated about how to identify malingerers by certain physical signs. Malingerers looked cunning, they overacted, and the symptoms were vague and diffuse.

If these techniques did not work, suspects could be tricked into revealing their true selves. The use of 'truth drugs' was recommended. Intimidation was considered legitimate. Physicians could start by "informing the simulator that one was fully aware of the deception and that he will face serious charges unless he gives up his symptoms at once and returns to duty", advised another medical corpsman.[30] They could threaten to put the men on the extremely dangerous and emotionally fraught duty of stretcher-bearing. It was even valid to inform patients that unless they quickly improved, they would be shot for cowardice.

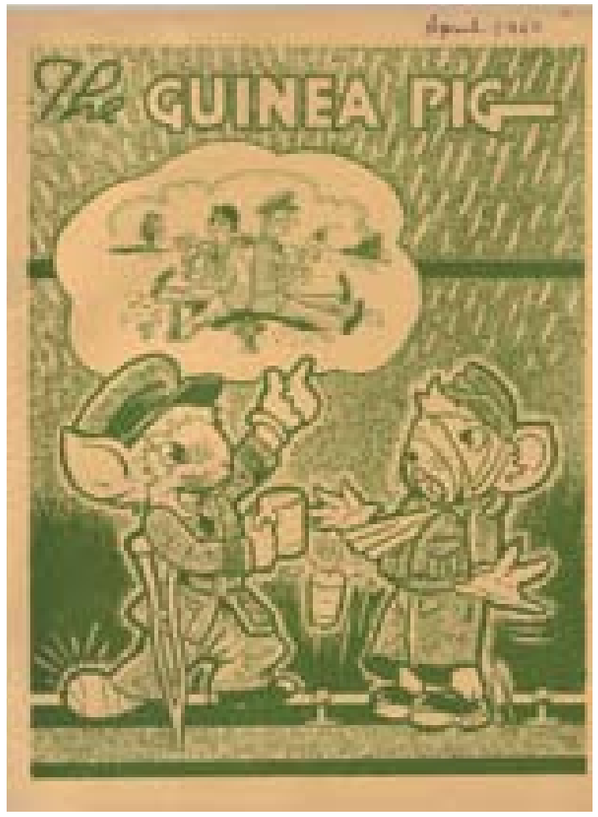
The justification for such techniques in wartime was obvious: malingering endangered other men. This fear was expressed by the authors of "The Military Malingerer" in *The Military Surgeon* in 1943:

> Now that we are engaged in a war which is literally a struggle for our very lives, we cannot tolerate the malingerer or countenance his parasitism in our concerted effort. Ours is a selfish attitude in demanding that hospital beds, military and civilian, be devoted for the genuinely ill, wounded and disabled.[31]

Given such sentiments (and as concern with military morale reached hysterical levels), it is not surprising that doctors tended to suspect every soldier who reported sick of being a 'skrimshanker'.

CONCLUSION: WAR'S AFTERMATH

Military medicine was more 'military' than 'medicine'. Some physicians expressed doubts about their role. The authors of *Shell Shock and Its Lessons,* 1919, for instance, admitted to feeling uneasy about declaring that a man who suffered shellshock after experiencing the horror of having to kill another human being had "lost his reason or senses". His senses were "functioning with painful efficiency", they dryly observed.[32] Others expressed reservations about the callousness induced by the endless exposure to what one doctor called so much "saddening raw living flesh".[33] Similarly, Wilfred



The Guinea-Pig magazine, 1950.
Printed with permission from the Queen Victoria Hospital NHS Foundation Trust, East Grinstead.

Willett, the young man with whom we started this essay, was wounded during the war and paralysed. He had been a student doctor prior to the war and, in talking to another doctor in the hospital, discovered that two military surgeons (he dubbed them 'Thread and Frog') were experimenting on wounded soldiers. "I couldn't stick [Frog's] and Thread's bloody experiments", he cursed, adding: "You'd have thought the war was being fought just to give them healthy specimens. Once up in the theatre they didn't care a bit about the case. Electric stimuli, ligatures, anything; like frogs in the phys. Lab."[34] The presence of a large and docile community of experimental subjects was too great a temptation for some medical officers.

However, the majority of medical personnel had little difficulty in adapting to the demands made of them in wartime. Physicians faced immense pressures to change their own values to pull them in line with those of the military. Conditions of work in modern conflicts provided scant time for introspection. The military as an institution was exceptionally powerful and provided very strict limits within which they could operate. Surgically, they were saving lives. They were doing an onerous and often dangerous duty. Many were haunted for the rest of their lives by what they had seen. In the end, however, military and medical disciplines enjoyed a symbiotic relationship. Medicine did not simply serve the military, but was crucial in actually defining and expanding military power so that the armed forces could control and direct the emotional as well as the material lives of its recruits with greater effectiveness.

LAVONNE TELSHAW CAMP

LINGERING FEVER: A WORLD WAR II NURSE'S MEMOIR

As a young staff nurse at New York Hospital, LaVonne Telshaw responded to President Roosevelt's plea for nurses to serve in military hospitals. After her basic training at Fort Dix, New Jersey, she was sent in 1944 to the fourteenth Evacuation Hospital in Assam, caring for soldiers in the China-Burma-India theatre of war.

THE FOURTEENTH EVACUATION HOSPITAL

My first assignment at the Fourteenth Evacuation Hospital was to a ward filled with Chinese patients, perhaps fifty men. The Chinese Army provided me with an interpreter, a real necessity, considering the communication problems that I faced. Yang Jei-pen was a serious young man, well educated by oriental standards, and very helptful in keeping the names of the patients sorted out. Unfortunately, he was not there all the time, and the Chinese ward boy who lived in the ward spoke little English. I had a difficult time keeping the Wongs and the Wangs, the Hos and the Hus straight in my mind, which made giving medications and keeping records a nightmare. I quickly learned the Chinese numbering system, numbered each man's straw pallet, called a *chwáng*, and identified the patient by the number on his *chwáng*. Alas, they switched *chwángs* whenever they felt like it, and laughed uproariously at their ability to confuse and frustrate me. I found it impossible to keep an accurate census. Sometimes when I came on duty a half dozen patients would be missing, and I later learned that they had returned to their military units without benefit of medical discharge.

Prior to arriving at this isolated hospital, I had not realised what role the Chinese played in the theatre's military operation, nor did I know about the urgency that America felt about keeping China involved in the war. Had this enormous country succumbed to the occupation by Japan, the United States could not have fulfilled its mission with Asia. The commanding general of the CBA, General Joseph W Stilwell, had been responsible for taking these Chinese peasants and turning them into an effective fighting force in the retaking of Burma from the Japanese. In Ramgarh, India, he trained several units of Chinese soldiers, equipped them as well as their American counterparts, and gave them the humane treatment that they had not known before. Recruits who came to the Chinese army had been victims of press gangs, forced into military service because they could not buy themselves out of it. Tied together with rope, they were marched to base camp and given three weeks training before being thrown into combat. Many of them marched in sandals made of straw and rope and slept under a blanket that they shared with four other soldiers. They were malnourished, ravaged with disease and had no spirit of aggressiveness that a soldier needs. Stilwell took these men and their officers and transformed them into a healthy army. He clothed them, fed them, inoculated them against disease where vaccines were available, and hospitalised them in American hospitals when they needed treatment.

Not all the Chinese soldiers were fortunate enough to fall under the aegis of Stilwell and the Americans. Some of them were replacements, poorly equipped, poorly nourished and totally untrained. China had been fighting the Japanese since it had been invaded in 1937. They were tired of war, but were beginning to realize that until the Japanese were driven from the mainland of Asia, they would never be free people. Many of the patients at the Fourteenth Evac. were casualties of the campaign to take North Burma. Those wounded in battle were far outnumbered by those who had fallen to tropical disease.

Many of the staff at the hospital, men and women who had been associated with the Chinese Army for a long time, were squeezed dry of compassion. They considered these soldiers as "hopeless, unreliable, corrupt, thieving sons-of-bitches" and seemed reluctant to go out of their way to offer treatment. It was nearly impossible for me to get a medical officer to look at a patient. Many of our doctors had been in the Pacific campaign for an extended time and were shipped to the CBI for yet another long tour of duty. Theirs was a malignant apathy towards Chinese patients, for they saw in these men a callous attitude toward human life, and they felt that their compassion was wasted. This had not been the case earlier in the campaign. There had been a splendid esprit de corps, but month upon month of intolerable conditions had wrung the juices of empathy from their very souls.

During World War II, the hospitals that provided medical services to our armed forces were first established as separate institutions in the States. Usually they were formed by a group of volunteers from medical schools and hospitals. The physicians and nurses, as well as technicians and other personnel necessary to the functioning of a hospital, were carefully selected and were particularly well qualified for the highest type of medical work. The *esprit de corps* and the morale of these groups was especially high, as they were identified with the prestigious institutions they represented. They had worked as a team in the civilian world and were enthusiastic about exercising their skills in the combat areas of war, or anywhere our fallen soldiers needed their special expertise. When these units were called to active duty, they were given a period of military training to familiarize them with army routines and procedure, then placed under the command of regular army officers. The 14th Evacuation Hospital was established by the University of Southern California and the 20th General Hospital was initially made up of physicians, nurses, and technicians from the University of Pennsylvania. I did not belong to this kind of group, but was sent overseas as a replacement for a nurse who had been at the 14th Evac. since its inception. She had the distinct advantage of belonging to an assemblage of professionals that had trained and worked together for many months. Her daily life was supported by the fellowship and camaraderie of her peers and their long association with each other. On the other hand, she had been exposed to the horrors of combat injuries, had worked lengthy hours under appalling circumstances and had been in the theater for such a long time that her health was compromised and her vitality depleted. I came without a "life support system," a newly graduated nurse, with very little experience beyond what I had learned as a student, thrown into an organization that was corroding from lack of spirit and breaking down from an exhausted will to perform. Society had insulated me from the "real" world. All my young life had been given over to learning, to getting as much education as I could

afford, seeking a place for myself in my chosen profession, which, in those years did not enjoy the almost limitless boundaries that it does today. Thrust into the strange and alien environment of Assam, working with Chinese patients—I had to make all kinds of adjustments in every region of my mind, just to survive. It was my intention to do a good job, to exercise my nursing expertise where it was needed, be it for the sick Chinese or for our own military patients, but I began to feel that nobody really gave a damn. There were many men and women like myself in World War II who found themselves unprepared for their roles but they learned quickly and functioned far better than they ever had dreamed they could.

The 14th Evac. was built originally for seven hundred fifty patients. During the campaign to recover North Burma from the Japanese, the 14th was asked to establish a branch hospital to receive casualties from the 5307th Provisional Unit (Special) code named GALAHAD, later known as Merrill's Marauders for Col. Frank Merrill, its commanding officer. These three thousand combat troops penetrated deep behind enemy lines, pushed through the putrefying jungle to flank the Japanese. Casualties, disease and fatigue ravaged heir ranks. As fast as the planes could evacuate the wounded, they came in and filled the beds. There were no helicopters, just some L-5s with courageous pilots who were willing to risk being picked off by the Japanese Zeros while they searched for a clearing where they could land. Many of these patients were seriously and acutely ill, suffering from exhaustion, malnutrition, typhus, malaria and amoebic dysentery. After months of horrendous conditions of jungle warfare, some of the men were more dead than alive by the time they reached the hospital. The two sections of the 14th Evacuation Hospital which were equipped and staffed for seven hundred fifty patients, now had two thousand eight hundred sick or wounded soldiers, American and Chinese, and even some British and Indians. Not all casualties could be evacuated from this guerilla action by air; many of them were brought in after days of struggling through thick forests, swollen rivers and streams, and mountainous terrain that required death defying efforts to traverse. Doctors, nurses and enlisted men worked fourteen and eighteen hours a day. After the battle to take Myitkyina, the patient population began to level off, but there was still much work to be done. It was at this time that my group arrived to relieve some of the staff. A great number of the remaining patients were Chinese, full of worms and other parasites, venereal disease, tuberculosis and dysentery. The morale of the hospital unit was on a precipitous decline.

I had the temerity to approach my nursing job in this ward of disease-ridden men as though the outcome of the war depended on it. We women, fresh from the states, must have looked a little foolish to the veterans who had been there for many months. After a few encounters with the reality of nursing in a thatched hut, of seeing patients sell their medications, of watching rats run under the *chwángs*, I was considerably subdued and had a better appreciation of the attitudes that prevailed.

The long *basha* that housed the patients was similar to all the other buildings in the compound. The floor was packed-down dirt that promptly became mud where the rain fell from leaks in the roof. The patients' *chwángs*, lined up on either wall, were raised a foot or so off the earthen floor. At one end of the building a small room, partitioned off with a woven bamboo wall, was the nurses' station. Here I kept the meager equipment needed: medications, needles and syringes, a few treatment trays, and the patients' medical records. Just outside this room was basin of Lysol solution on a little table where I could immerse my hands after ministering to an infected patient, dressing a purulent wound, or cleaning up an ulcerated mouth. I chuckled to myself, thinking of the impeccable aseptic technique that I had been taught to use ....

I enjoyed that time of day when the cook brought in the tea and rice. Those patients who could ambulate on their own steam would gather, squat on their haunches and wait for their rice bowls to be filled. Their conversation, always punctuated with great bursts of laughter, made me feel good, even though I hadn't the vaguest idea what was bringing such apparent joy. They held the rice bowls up to their chins and with two chopsticks held close together they shoveled the rice into their mouths, down to the very last grain. Afterward they drank tea and smoked. The way to a Chinese patient's heart was through an American cigarette.
Even in throes of illness these patients could not quite understand why the American nurses tended to their needs. They giggled when I checked a pulse rate; they thought it humorous that I would place a stethoscope on their chests to listen, and they had not the slightest idea what I was listening for. They watched every move I made, perhaps with distrust. Sometimes when I gave them medicine, they would take the tablets in their hands, and later walk all the way to Ledo to sell it to the local citizens who prized the quinine and the atabrine, for they too suffered from malaria.

Originally published in "A World War II Nurse's Memoir",
McFarland & Company, Inc Publishers.

Urban warfare; Russian soldiers, in Stalingrad, Second World War.
DHM, Berlin.

STALINGRAD

WOUNDED BODIES AND SOULS

Wolfgang U Eckart

INTRODUCTION

For decades, the encirclement of the city of Stalingrad by the Germans and the battle that took place there (22 November 1942 to 4 February 1943) was one of the most traumatic events of the Second World War in the German collective memory. It marked the beginning of the collapse of the front in the occupied part of the Soviet Union, and was thus a turning point in the war. It also marked the beginning of desperate attempts on the part of Hitler's leadership clique to lie their way out with propaganda, as exemplified by Joseph Goebbels' infamous speech on 18 February 1943 in the Sportpalast, Berlin. But above all, Stalingrad marked the betrayal, suffering and senselessly wasted lives of the German soldiers in the East and that of their despairing relatives at home. Hardly any other event of the war, not even the Allied landing in Normandy, has had such an influence on the flow of German literature after 1945 on the war in the East, a flow of various political colours and intentions that still continues today.

The medical situation in the encirclement of Stalingrad, however, has received little attention until now.[1] Reconstructing it from the extant files and from the retrospective literature tells us much about the experience of the siege. It also tells us about the political and military leadership and its contempt for humanity, a leadership that, in the service of propaganda, accepted the destruction of the Sixth Army in Stalingrad against all military reason, hiding the fate of the trapped soldiers in lies and declaring the situation a "large-scale experiment in starvation".

When the encirclement of Stalingrad was completed on 22 November 1942, it enclosed approximately 300,000 German soldiers and those allied with them. Some 100,000 to 145,000 of these "fell in battle, froze to death, starved, succumbed to epidemics and other diseases".[2] Between 29,000 and 45,000 wounded, ill and healthy men—the numbers cannot be established with any certainty—were flown out of the encirclement before they could be captured, often under dramatic circumstances. More than 90,000 men were captured prior to, and especially

Tank fight near Stalingrad, June 1942. Ullstein Bild—Nowosti Collection.

after, the capitulation on 2 February 1943 and became Soviet prisoners of war. The majority of these exhausted troops were wounded, suffering from frostbite, disease and extreme malnourishment.

WOUNDS AND DISEASES—MEDICAL CARE

Medical care among the German land armies in the course of the early phases of the Second World War was considerably hampered by inadequacies from the start. The medical units stationed at the rear had a great deal of difficulty in keeping up with the combat troops. This was particularly true of the attacks on Poland, the Benelux countries and France. The experience gained in these battles did prove useful for the preparations to attack the Soviet Union, but the battles at Moscow and Stalingrad again confronted the medical corps with problems for which it could not have been prepared, since the eventuality of large-scale retreats or even of long-lasting encirclements had not been taken into consideration. Primarily, these difficulties were those of supply, caused by inadequate transportation. Medical materials from the stores on the Eastern Front, such as that at Charkov, could not be brought to the main front because the transport was being used instead to take fresh units and ammunition to the front. For the same reason, the wounded could no longer be transported in sufficient time and quantity to the hospitals in the rear. The main problems for the medical care of the soldiers trapped within the encirclement were the large number of wounded and the constantly growing cases of severe frostbite. Abdominal gunshot and shrapnel wounds posed the greatest challenge,

German troops charging up a hill near Stalingrad, October 1942. Ullstein Bild—Granger Collection.

since often the intestines and stomach were multiply perforated, which would have required special care. But care of these life-threatening wounds was impossible. It simply took too much time and often met with failure. Nearly every abdominal-wound operation kept "a whole team busy for one and a half to two hours", and entailed a mortality rate of approximately 50 per cent.[3] Operations of this kind were therefore soon put aside in favour of others with a better success rate. Since soldiers with abdominal wounds usually needed to be transported lying down, and therefore required considerable space, few, it may be assumed, were flown out.

Surgeons often worked for days on end to the point of exhaustion, with only brief breaks. But it was not just the direct surgical treatment of the soldiers that was difficult. Soon after the encirclement was completed, the problem of post-operative treatment of the wounded became acute. To relieve pain, morphine was given, or its substitutes Pantopon, Dilaudid and Eugodal, as long as supplies lasted. In the first days of the siege, loss of blood could be compensated for with packed blood, direct transfusion, or by means of infusions of physiological sodium chloride and nutrient solutions, at least, as long as these could be sufficiently thawed out. By the beginning of December 1942, however, it was no longer possible to get sufficient supplies of medicines and blood substitutes through. The infusion solution Tutofusin, in particular, was soon in dramatically short supply. Blood-group tests were also lacking. The work of the surgeons within the encirclement was therefore reduced to purely operative activity. Post-operative care of the patients, decisive for survival, was no longer a consideration.

Among the illnesses observed in the encirclement was infectious hepatitis, cases of which increased in frequency with the duration of the siege. Daily life was characterised by influenza infections and all kinds of diarrhoea, mostly harmless gastroenteric colides. These were not, as a rule, cases for hospital treatment, but soldiers with jaundice and dysentery had to be treated in the clinic. In particular, soldiers with 'Balkan anamnesis' had frequent recurrences of malaria, which had even prior to the encirclement, together

German troops in Stalingrad, October to December, 1942. DHM, Berlin.

with infectious jaundice cases, led to men being unfit for duty. In view of the season, however, fresh cases of malaria within the encirclement were no longer expected. This was also true of steppe (*pappataci*) fever, a highly febrous viral disease transmitted by mosquitoes, which had considerably weakened the troops during the late summer and the autumn. Typhus cases in larger numbers, and cases of other such diseases, did not occur until after capture for the most part. Within the encirclement itself, it cannot be said that there was any serious outbreak of infectious disease until capitulation.

MEDICAL FACILITIES

All the receiving stations for the wounded, the main first-aid stations and smaller medical stations of the divisions were either lost one by one as the encirclement tightened, or had to stay in constant movement, only to be completely destroyed following the commencement of the Soviet offensive of 10 January 1943. However, the larger medical facilities within the encirclement, which took on thousands of wounded and ill, and were chronically crowded, are known to us. At the beginning of December, a large first-aid station was set up directly beside the airstrip at Pitomnik, which served as the rendezvous and first-aid location for the most severely wounded men, who were to be flown out. An establishment with a similar function, although of smaller size, was at the auxiliary airstrip at Basargino. A large hospital base existed at Gumrak (for a time the site of the headquarters of General Paulus) from the beginning of December 1942 until the start of the Soviet January offensive. Medicines, bandages and other medical material—altogether some 100 tonnes—were delivered to this hospital base from a medical supply distribution centre that had been set up in buildings belonging to the Sovkhoz Karpovka and which was directed by one Staff Apothecary Bruch.

Lorries were available for the transport of the wounded; their number was still designated as sufficient at the beginning of December. At this point in time, the number of wounded and ill at Gumrak, for example, was 1,437, while in the encirclement

Red Army soldiers fighting in the streets of Stalingrad, October 1942. Ullstein Bild—Nowosti Collection.

altogether, according to estimates, there were about four to five thousand injured men. This number, however, might have been considerably smaller if the transport of wounded had been carried out without hindrance prior to the closure of the encirclement. Instead, there were traffic jams, blockages and other obstacles. On 18 November 1942, only four days before the encirclement came into effect, Surgeon-General Renoldi was forced to point out that things were going grievously wrong with the transport of wounded in the hospital trains. On their return trips, these trains were sometimes "heavily damaged", even "plundered", by marching battalions and men on leave. Locomotives provided for the hospital trains were sometimes sent back, resulting in delays of up to 18 hours. Interference of this and similar kinds resulted in "damage and loss" that could "no longer be made good".[4] The situation worsened with the closure of the encirclement, since there was a constant stream of wounded and ill from the already overfilled hospitals of the western military areas, which had to be evacuated one after another.

An die im Raum von Stalingrad eingekesselten Offiziere und Soldaten der deutschen Wehrmacht

Soldaten und Offiziere der im Raum von Stalingrad eingekesselten deutschen Armee!

Einen ganzen Monat seid Ihr jetzt schon umzingelt; ein dichter Ring von Sowjettruppen hält Euch umfaßt.

Ihr habt auf die Hilfe der Truppen gehofft, die Hitler in aller Eile im Raum nördlich von **Kotelnikowo** zusammengezogen hat.

So wißt denn, daß wir diese deutschen Truppen vernichtend geschlagen haben.

Im Raum von Wassilewka—Werchnje-Kumski—Klykow hat die Rote Armee sechs deutsche Divisionen, darunter drei Panzerdivisionen, überrannt und zerschlagen, die Überreste dieser Truppen um **60—85 Kilometer** zurückgeworfen und in diesen Kämpfen **278** deutsche Flugzeuge, **427** Panzer und **321** Geschütze vernichtet. **Allein an Toten haben die Deutschen hier 17 000 Mann verloren.** Eure Hoffnungen, aus der Richtung Kotelnikowo Hilfe zu bekommen, sind damit zuschanden geworden.

Ihr habt gehofft, daß Euch die Truppen heraushauen werden, die Hitler in aller Eile im Raum von **Tormassin** zusammengezogen hat.

So wißt denn, daß auch diese Truppen vernichtend geschlagen und aufgerieben sind.

Die Rote Armee ist auch am mittleren Don zur Offensive übergegangen und hat in den Kämpfen zwischen dem 16. und 27. Dezember **38 000 deutsche Soldaten und Offiziere vernichtet, 56 000 Mann gefangengenommen, 305 Panzer, 2128 Geschütze, 310** Munitions- und Lebensmittellager erbeutet bzw. zerstört.

Unsere Truppen haben die Städte Millerowo, Tormassin, Tarinskaja und Morosowski erobert.

Während eines Kampfmonats im Raum von Stalingrad und während der zehntägigen Kämpfe am mittleren Don haben die deutschen Truppen

Insgesamt 169 000 Mann an Toten und 138 000 Mann an Gefangenen sowie 2663 Panzer und 5356 Geschütze verloren.

Eure Hoffnungen, aus der Richtung von Tormassin Hilfe zu bekommen, sind ebenfalls zunichte geworden.

Ihr habt schließlich gehofft, durch die **Transportflieger** Hilfe zu bekommen.

Soviet propaganda handbill for German soldiers in Stalingrad, December 1942.
Photo AKG Images.

German POWs cutting a loaf of bread (Russian propaganda photograph).
DHM Berlin.

STARVATION WITHIN THE ENCIRCLEMENT

Soon after the closure of the encirclement, the remaining physicians began to notice a remarkable increase in cases of death whose causes could not be explained by wounds, disease or frostbite. In fact, the real culprit was the lack of supplies, especially of food, which made itself felt as soon as the encirclement was complete. It was thus probably quite clear that these were cases of death by starvation; of course, this would only have been very quietly and privately acknowledged, if it was mentioned at all. Officially, it was "assumed" that the deaths were caused by "hypothermia and exhaustion"; naturally, none of the physicians in the encirclement dared to talk of starvation.[5] Günter Toepke also describes this in his Stalingrad memoirs:

> The army doctors observed the state of health of the troops quite exactly. Swelling of the extremities could be seen in many of them already. These starvation oedemas were the natural result of the insufficient nourishment. Otherwise mild illnesses, such as flu or colds, began to prove fatal. I knew that, until now (around Christmas time). according to the findings of Surgeon-General Renoldi, such illnesses had ended fatally in 56 cases. The word 'starvation' was not written on the certificate of death, just 'acute illness'.[6]

In view of this, on 15 December 1942, the Army doctor in Morosovskaya, outside the encirclement, gave the pathologist Hans Girgensohn the task of clarifying the causes of death of unwounded soldiers within the encirclement. The pathologist was flown in on 18 December and was met at Pitomnik airport by Stabsarzt Dr Seggel, who took him to the army field hospital near Gumrak train station. Girgensohn describes his accommodation as "luxurious" in comparison with the normal conditions in the encirclement. It was:

> an earthen bunker dug into the clay of the steep Balka ravine, with a wooden wall at the front; inside were two double field bunks with sheets (!), a table, and an iron heater, which was fed with wood from the house ruins

General Field Marshall Friedrich Paulus, Commander in chief of the 6th Army in 1942. Photograph AKG Images.

of Stalingrad. The wounded lay in a temporary wooden barracks building, squeezed together.[7]

The divisional physicians informed him by telephone of the fatalities requiring examination. He then went to the location given, together with his two autopsy aides.

> The trips to the sections in the 30 to 50 km diameter encirclement were difficult. We had to improvise and to find unconventional ways to do things. By way of an operating theatre, an earthen bunker was provided; if it was a village, a room in one of the huts was temporarily emptied; perhaps a railway wagon or a tent was available.

On one occasion there were three autopsies to be carried out, one after another; this had to be done in a trough in the snow at minus 30 degrees Celsius and with strafing by enemy planes. "Hot water was brought repeatedly from a small bunker, to let me thaw out my frozen fingers in their rubber gloves." The extreme frost caused quite different problems. Frequently, the corpses to be examined were frozen as hard as boards. They had to be thawed out with a great deal of trouble before an autopsy could even be considered.

Altogether, Girgensohn carried out 50 necropsies between 19 and 31 December. In 25 cases, the signs of death by starvation were present. In these cases, the proof lay in the total "disappearance of the fatty tissue", the "atrophy of the heart and liver", the "disappearance of skeletal musculature", and the "swelling of the right chamber of the heart". Perhaps the most discouraging result of the autopsies

was the discovery that even short-term high-caloric nourishment would not have meant the rescue of those starving, but on the contrary their rapid deaths. The pathologist reported on this:

> It happened quite often that a soldier … would tell the non-commissioned officer of the rounds, 'I am feeling fine, I want to eat something now' (a small piece of tinned fatty meat, which was flown in with precedence because of its high caloric content); when the non-com came round again, the man would be dead. The necropsy then regularly showed, in the mesentery of the small intestine, which was completely free of fatty tissue, that the lymphatic vessels were stuffed full and yellow with the absorbed fat, in a way otherwise seen only in anatomical injection preparations. The commencement of digestion had overtaxed the circulatory system and led to death.

The dissections also brought to light the results of a mistaken decision that had been made long before the closure of the encirclement. The majority of those dead from starvation were in the 113th Infantry Division. The paymasters of this division had been decorated because in the autumn of 1942, hoping to hoard supplies before the rainy, muddy periods that entailed severe interruptions of supply, they had already reduced the rations of their units. When, in the encirclement, the remaining supplies were distributed as evenly as possible to all units, it was this "well-supplied" division that became the "preferred casualty of starvation, in view of its already malnourished soldiers".

It was not only German soldiers who died of starvation in and around Stalingrad. Hunger also hit the Soviet prisoners of war in particularly cruel fashion; before Christmas, some 3,500 in the prisoner-of-war camp at Voropnovo near Gumrak were packed together in an inadequate space. Around Christmas 1942, Captain Toepke, who was deployed with the quartermaster of the Army top command six, reported to the Army paymasters on the position of the prisoners of war:

> Both have confirmed that the situation is no different in the prisoner-of-war camp (presumably Voropnovo). It is quite intolerable to see this misery

without being able to help. Swollen extremities can be seen in most prisoners. Typhus is spreading; every day about 20 fatalities lie about in the camp. The weakened bodies had no more resistance left. The cause of death was given on the death certificates here, too, as (just) typhus.[8]

In fact, the commander-in-chief of the Sixth Army, General Paulus had ordered the release of the prisoners of war on 14 January in view of this situation; however, he was unable to determine whether this order had been carried out. The poet Erich Weinert, a German volunteer with the Red Army, had been at the front at Stalingrad since 2 December 1942. In a note in his diary from 25 January 1943 he reports a horrific find in liberated Gumrak:

> Early this morning a walk through Gumrak. Some houses are still smoking, hit yesterday by German bombardment. The whole landscape nothing but ruins and corpses. Snow during the night had half-covered the horrible scenes. Here and there bare skulls, hands or feet sticking up through the snow. In a ravine we find a mountain of corpses of Russian prisoners of war, nearly naked, thin as skeletons, the skin already blackish-brown, all thrown together in a heap. They must have lain here for some time already, having starved to death or been tortured to death.[9]

Girgensohn, too, had had the opportunity to see and dissect Soviet victims of starvation. He reports that, after the autopsy of three Soviet prisoners of war, who had been active as volunteer workers, the "young officer of the unit" enquired about the cause of death. Upon hearing the diagnosis "starvation", he was quite taken aback. This could not be right: "They receive the same rations we do—three slices of bread and a half-litre of good horsemeat soup (water with four to five small cubes of meat)!". This statement was not correct, as shown by Toepke's memoirs.

The nutritional situation for the German soldiers in the encirclement worsened dramatically after Christmas, while Girgensohn was still carrying out his post-mortems. An order dated 26 December 1942 reduced the bread rations from 100 grammes to 50

Junkers airplane being prepared for a rescue flight into Stalingrad.

grammes "per head a day". The Army top command had avoided ordering this reduction in the period before Christmas for psychological reasons. "Various units had, nevertheless, been forced to carry out this reduction before Christmas, owing to the desperate situation." In addition:

> at midday a litre of soup could be issued. It was made without the addition of any fat, usually of pulses. In the evening there was tinned food, or, depending on the place, a second, thin soup dish, thus decidedly calorie-poor food. The result was a rapid and general loss of strength among the troops.[10]

On New Year's Eve of 1942, the pathologist wrote his concluding report, which clearly identified those who had died from starvation. On the morning of 1 January 1943, Girgensohn handed the report to Stabsarzt Seggel, who sent it directly to General Paulus. Five days later, Surgeon-General Renoldi expressed his opinion of the situation in a letter to the Chief Quartermaster of the Sixth Army:

> Since the beginning of December 1942, the army has been carrying out a large-scale experiment in starvation. The quantities established then—and still valid now—contain about half the nourishment needed by a working adult. There is no doubt that one can expect soldiers to get along with such nourishment for a limited time without serious consequences, when circumstances demand.[11]

The report only hinted at the deficiencies of the nutritional situation in the encirclement and

recommended 3,200 calories per day per man, which was still too little. The concept of the "experiment in starvation" is nevertheless surprising. It cannot be established whether Renoldi meant this ironically or whether he actually conceived of the situation in the encirclement as a physiological experiment. Examples of this kind of thinking are known from the First World War. But in the midst of the all too concrete catastrophe of the Sixth Army in January 1943, such an idea would have been quite out of touch with reality, even cynical. For what was happening in front of the eyes of the highest-ranking medical officer in the encirclement of Stalingrad was no experiment in nutritional physiology, but a large-scale supply disaster caused by dereliction on the part of the army command and quite certainly without any claims to scientific validity. Intentional and systematic experiments of this murderous kind had indeed been carried out, but in German camps with Soviet prisoners, where, as early as the summer of 1941, the daily caloric intake was already less than the minimum needed for existence, but still above that in the encirclement of Stalingrad.

LAST HOPE—THE WOUNDED ARE FLOWN OUT OF THE ENCIRCLEMENT

With the closure of the encirclement on 22 November 1942, the last options for transport by land vanished; the wounded and ill could only be flown out. Those whose wounds were slight were flown as a rule to Morozovsk, those more seriously wounded to Tatsinskaya. Airstrips were available within the encirclement at Pitomnik and Basargino (until 14 January 1943) and at Gumrak (until 16 January 1943). A small, temporary airstrip at Stalingradski, a few kilometres from the city itself, existed for a few days after the surrender of Gumrak. Although this airstrip was constantly under bombardment, it was possible nonetheless for a few supply planes to land and then take off again, fully laden with wounded. The last aircraft left Stalingradski on 23 January 1943.

The ill and wounded reached the airstrips in different ways; many came in vehicles, many more on foot, and some even crawled. For those flown out, a safe landing in Morozovsk or Tatsinskaya meant rescue from immediate danger to life and limb; rapid transport from these airfields to medical stations further on behind the lines was another matter. Bottlenecks occurred both in the transport from the airfields and in the further transport by rail. It is impossible to establish exactly how many ill, wounded and healthy men were taken out of Stalingrad between 19 November 1942 and 24 January 1943. The numbers given in the literature lie between 29,000 and 45,000. Estimates of the numbers flown out of the airfield at Pitomnik between 19 November and 2 December exist: "some 2,000 wounded and ill".[12] The daily performance of the transportation for wounded depended on enemy air activity, and could vary considerably. Within the encirclement, counting was carried out under "normal" transport conditions, and what was counted was "what was loaded, not what arrived".[13] The aircraft were generally overloaded, landed and took off under bombardment, and, when they flew in good visibility, were constantly beset by Soviet fighters. At least 495 transport aircraft are known to have been lost, which would indicate several thousand victims among the aircrews and wounded.

At Pitomnik, the wounded, who were temporarily placed in Luftwaffe bunkers and shelters, were collected, examined and transported to the airstrip by a medical company of some five or six physicians. There the 'passengers' were placed on a list; then the "planes, as soon as they had been unloaded, had to be reloaded immediately with wounded". When possible, last-minute medical treatment was given for the short period of transport. This, according to the Army Physician for the Sixth Army, functioned "excellently within the shortest possible time".[14] Every wounded man apparently had a certificate from the unit administration, on which his name and the type of wound were noted. Prior to take-off, the correctness of this information was supposedly checked by a doctor. Despite this, men pretending to be wounded probably got through. After such cases began to show a marked increase among the officer corps, officers were only permitted to fly out after personal examination of their cases by the Army Physician. An exact examination at peak times, ie when transport was favourable and more than 1,000 wounded were being flown out daily, was hardly possible. In such cases the doctors responsible for the transfer were personally responsible to the Army Physician for the validity of the permit of leave.

DR Fitzpatrick, *Gate to Stalingrad*, American cartoon, 1942.
Ullstein Bild—Granger Collection.

Occasionally a search for 'shirkers' at the airfield of Pitomnik was carried out in the form of 'purges', as can be seen from an entry in the War Diary of the quartermaster section of the Sixth Army for 29 November 1942: "Among the wounded at the airfield at Pitomnik a search for shirkers and malingerers was carried out, resulting in some 150 to 200 soldiers being returned to the troops."[15]

Situations of panic or dramatic bottlenecks did not occur until immediately before the 'final evacuation' of the airfield, according to the statement of the Army Physician. Prior to this, everything was 'under control'.[16] What was kept 'under control' was, of course, a disastrous evacuation emergency, which set in quite soon after the encirclement was complete. The daily number of wounded exceeded the transport flight capacity of the Luftwaffe many times over.

Obviously Renoldi, who was responsible for the transport out of the encirclement, and who—according to rumours among the trapped medical

officer corps—had been ordered into the encirclement personally by General Paulus, was completely out of his depth with the organisation of transport from the medical stations of the division at the airfield. His adjutant cooperated closely with quartermaster corps to "ensure an exact overview of the transport of the stream of wounded";[17] but what use could this be, when neither air-transport capacity nor shelter close to the airfield were sufficient to "transport thousands of sick and wounded"?[18] The fact that the shelters at the airfield were "bursting at the seams with wounded" was not only owing to the lack of flights to take them out, but also to the incompetence of the Army Physician.[19]

The situation worsened dramatically with the start of the Soviet offensive from 10 January 1943. On 12 January, increased military pressure from the west necessitated the evacuation of the main first-aid stations in Dimitriyevka, Karpovka, Novo-Alexeyevka and Barbukin. Hundreds of the most severely wounded were evacuated from each of these positions with all available vehicles, and under most difficult circumstances, towards the east, in the direction of Stalingrad. Parts of these disorganised columns also reached the airfield at Pitomnik and contributed to the worsening of the situation there.

Increasing pressure from the Soviet military, but also rumours of the imminent fall of Pitomnik, then destroyed the fragile balance at the airfield. Army Engineer Commander Seile reports on the increasing tension at the airfield. On 12 January, he wrote, the airfield was abandoned "for no visible reason". The departure from the airstrip had resulted in "scenes that were not exactly encouraging", and "not justified by anything", for "far and wide" there was not yet a Russian to be seen. Nonetheless, "the air was suddenly full of panic"; "showing no inner discipline, obeying no other law than that of primitive self-preservation", everyone was "in wild flight to the rear".[20]

Just what the "scenes that were not exactly encouraging" were cannot be reconstructed in detail. The only certainty is that the airfield and the bunker of the medical company, about 500 metres distant, were so crowded with wounded days before the evacuation

Soviet soldiers embracing after the surrender of German troops, 31 January 1943. Ullstein Bild—Nowosti Collection.

that there was little hope that any would be flown out. The impending involvement of the airfield in the front lines, hunger, frostbite, wounds, the stress of selection prior to being flown out, and the obvious fate that awaited the men when the airfield was captured—all appear to have been causal factors for the chaotic conditions just prior to the surrender of the airfield at Pitomnik. When the rumour of approaching tanks occurred simultaneously with the take-off preparations for two aircraft that would probably be the last to leave, the final psychological barriers were broken down. Violent attempts were made to storm the last aircraft directly before and even during take-off. As eyewitnesses have confirmed, violence was used in turn to allow it to take off. Whether an express order to shoot was ever given to the ground personnel remains unclear, but this is not improbable in view of the situation. The events in Pitomnik have not been preserved in document form; statements by witnesses and the memories of those directly involved are few. But this little is clear enough. Gisela Girgensohn, the wife of the pathologist, reported the experiences of her uncle Walter Vleugels, who told her that he:

> had been flown to Stalingrad-Pitomnik as a member of an aircrew (not as a pilot). Prior to take-off and the flight back, the soldiers nearly took the aircraft by storm, and at take-off some threw themselves … screaming into the propellers or held onto the landing gear of the Junkers.[21]

Renoldi observed the evacuation of the airfield at Basargino on 14 January. Despairing attempts, undertaken with the men's last strength, to reach transport aircraft still flying out had taken place at this airstrip, too. Reports from Luftwaffe men, mostly pilots, on the situation at Gumrak also exist. These give an idea of what scenes must have taken place there among the despairing wounded men. On 17 January 1943 "wounded, who could no longer be taken along, and who lost their heads altogether" prevented a plane from taking off. Luftwaffe officers stopped the storming of the aircraft with submachine guns. Only a few "severely wounded", who "had secured a place in the aircraft before the totally exhausted men, because of their physical condition", could be flown out.[22] On 19 January "lightly wounded men" stormed the taxiing aircraft in their despair, without waiting for them to be unloaded. The crush was "beaten back with slats"; one man was killed and one officer had "all the fingers on one hand cut off".[23]

The situation of those desperately hoping for rescue at the last temporary landing strip in the encirclement at Stalingradski, available until 23 January 1943, was the same. On 23 January, a Junkers 52 aeroplane was just able to take off from Stalingradski, under direct fire. A last take-off attempt took place the following day. The aircraft never left the ground and fell into Soviet hands.

RETREAT OF THE WOUNDED INTO THE CITY CENTRE

The accommodation for the wounded could be called "sustainable" (under the circumstances) at the relatively well built-up northern front, indeed in the city area of Stalingrad itself, too, according to the preliminary opinion of Captain Toepke, even after the encirclement was complete; but the situation at the western front of the encirclement was "catastrophic" from the very beginning of the encirclement, with temperatures of minus 30 degrees Celsius, and a lack of space for the wounded.[24] "Under these circumstances, what with the icy cold and the even icier wind off the steppes, any attempt at treatment had to seem senseless." The wounded, sick and starving froze to death in their hundreds. The progressive decrease in bodily strength of all soldiers, including the medical personnel, meant that even before Christmas:

> in the field hospitals no normal interment could be carried out any longer, because the personnel … were not able to dig into the hard-frozen earth with spades and picks. The dead were laid on the bare ground and covered with snow.

On 8 January, Lieutenant-General KK Rokosovski, the commander-in-chief of the Soviet troops on the Don front, sent a message to General Paulus, in which he expressly referred to the situation of the German sick and wounded in the encirclement:

> The position of your trapped troops is difficult; they are suffering from

hunger, disease, and cold. The grim Russian winter has hardly got started. Heavy frosts, cold winds, and snowstorms are all yet to come. But your soldiers are not equipped with winter clothing and find themselves in difficult circumstances that render medical aid well-nigh impossible … All wounded, sick, and frostbitten men can expect medical help.[25]

Paulus, remaining "true to the Führer", refused, and with that sealed the fate of the soldiers entrusted to him, creating the prerequisite for the final destruction of his army.

With the commencement of the Soviet offensive from 10 January, the situation for the wounded and sick in the encirclement worsened. Although the danger of an impending offensive ought to have been clearly recognisable even before the refusal of the Soviet offer of capitulation, no preparations were made for an increase in the number of wounded, not to mention for a rapid evacuation in the direction of Gumrak and Stalingrad. But it was not only this glaring lack of provision, which must have been quite obvious to those involved, especially the medical personnel, that contributed to the worsening of the situation. Directly following the commencement of the January offensive came the inhuman order to surrender first-aid stations into "enemy hands" after doctors and nursing personnel had left. Thousands of wounded soldiers were thus quite deliberately left to freeze to death, since they could not even keep the most primitive fires going without help. "Under these circumstances, every man who could somehow manage once more to pull himself together dragged himself"in the direction of Gumrak, Pitomnik and Stalingrad.[26] A "dying army" flooded towards the ruins of Stalingrad:

> The scattered men, the starving ones, the freezing ones, the sick … the remains of the shattered and shrunken units, columns and others, with vehicles slowly pushed and pulled by men. Wounded, ill, and frostbitten men. Emaciated figures were among them, with coats, tarpaulins, and rags wrapped about them, wretched pictures of misery, dragging themselves with great effort, limping forward with sticks, and with their frozen feet wrapped in bits of straw and the remains of blankets.[27]

A radio message of 24 January 1943, sent to the army of the Don, told of the chaotic conditions:

> Horrific situation in the city area proper, where roughly 20,000 wounded are searching for shelter in the ruined houses, with no medical care. Among them as many starving men, frostbitten men, and scattered men, generally unarmed, as weapons had been lost in combat. Heavy artillery fire on the entire city area.[28]

Not all soldiers reached the city of Stalingrad, that last doubtful refuge from death or capture. The dying army was vanishing even on its way into the ruins of the city, leaking away in driblets into holes, caves, bunkers and ruins. On all routes of the retreat some 20,000 men crept into their final shelters; even these were fought over by the dying, trying to find a little warmth and comfort. "Entire packs of men", reports Waasen, "had gathered together like dying animals; the partial darkness was relieved only by a few Hindenburg lights; the stench of blood, pus, and excrement was very intense".[29]

Few, if any, of these places of refuge offered anything more than a little warmth and a brief feeling of safety. Cellars full of wounded who would never receive medical aid formed lines as long as the streets under the sea of ruins that was Stalingrad. With the tightening of the noose, the remains of the Sixth Army flooded into the cellars even in the city centre, like an "invasion of bleeding misery".[30] J Wieder writes of an "underground and ghostly empire", extending underneath the "eery stony desert" of Stalingrad. "Every hole in the ground, every bunker, every cellar, each and every room offering shelter was filled to bursting".[31]

The largest of these cellars of death, one below the former Local Headquarters Centre at the Heroes of the Revolution Square, and one beneath the building housing the Red Army Club, each contained over 1,000 wounded. In the cellar of the theatre some 800 sheltered; in the Timoshenko Bunker

A German plane shot down over Stalingrad, 2 February 1943.
Ullstein Bild—Nowosti Collection.

several hundred found refuge. The Timoshenko Bunker was an extensive underground system of shafts, whose chambers and corridors were "stuffed full" of sick and wounded during the last days of the encirclement, as Hans Dibold reported in his memoirs. "Without pause" they

> pumped new wounded into the seemingly endless system of corridors. For several days then the entrance to the corridors lay in no-man's-land between the fronts. Then the Russians came, took away those sick men who could still walk, except for a few, and removed the lighting.[32]

Dibold himself spent the last hours before capture in the cellar of the former GPU building, where he set up a kind of first-aid station and waited for the Red Army soldiers to arrive. In the packed cellar, reports Dibold, "the soldiers lay on the floor" or "on, under, and among bedframes and pallets".[33] By the end, the sick men had lost all will "to do more than what was required by the needs of the moment". [34] The doctor and many of the wounded entrusted to his care were captured shortly afterwards. Others were less fortunate. The building of the former Local Headquarters Centre, filled with sick and dead, was bombarded into flames in the final days of January and burned—a monstrous crematorium—down to the foundations. Only a few escaped.

In many houses and cellars serving as a last refuge for the wounded, the victors of the battle found mountains of corpses, and a few survivors, after the capitulation. The American journalist Edgar Snow, who saw Stalingrad on 4 February, two days after the capitulation, reports on such a find in the ruins of the former Red Army Club, which had been converted to a field hospital:

> In a distant corner we found a heap of half-naked Germans, the corpses of wounded men, who had apparently been thrown there by other occupants too weak to bury them or burn them. Many of the dead had rags wrapped around their hands and feet … all of them looked half-starved …While we were staring at this horrible scene, a figure seemed to detach itself from the corpses; it staggered towards the back of the room, which was filled

German POWs in Stalingrad, February 1943.
DHM, Berlin.

> with excrement and filth. We stepped back, aghast. When we looked at the place from where the figure had come, we saw a small opening into the cellar level below. Bending over this, a disgusting stench rose up to us; evidently others were still alive down there. The Russians were so busy burying their own dead that they had not yet been able to bring in all surviving Germans.[35]

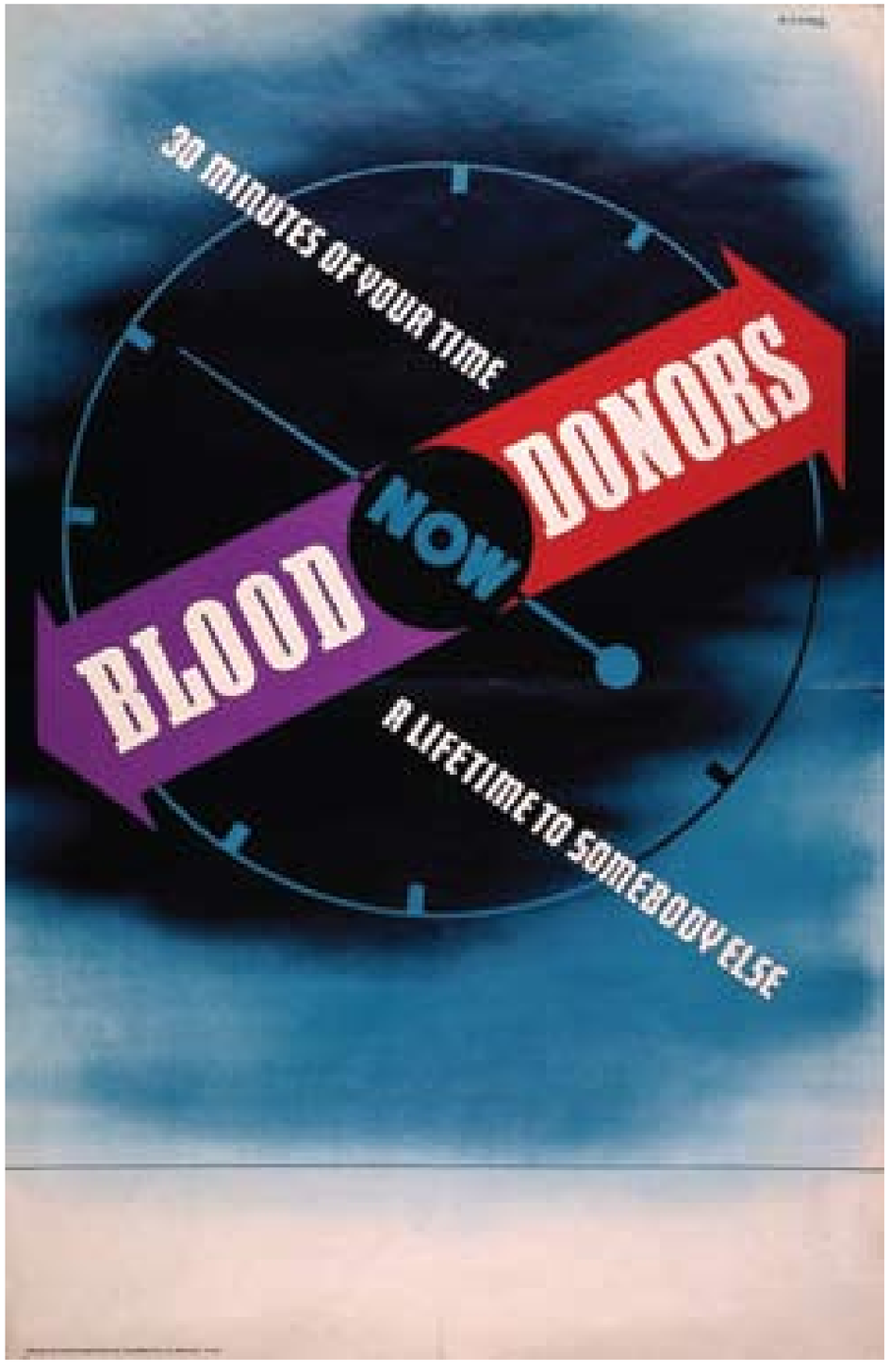
Four days before the journalist's experience, the remains of the Sixth Army had capitulated in the southern and central encirclements of Stalingrad, and two days after this the rest of the army in the northern sector had also capitulated. Over 90,000 soldiers were taken as Soviet prisoners of war.

The capitulation did not end their suffering. The second day of February 1943 simply marked a stage in the odyssey of suffering of the wounded, sick and exhausted men of a maltreated army through a "dark valley" leading to the Soviet prisoner-of-war camps, where countless further numbers fell victim to the vicissitudes of the camps. [36]

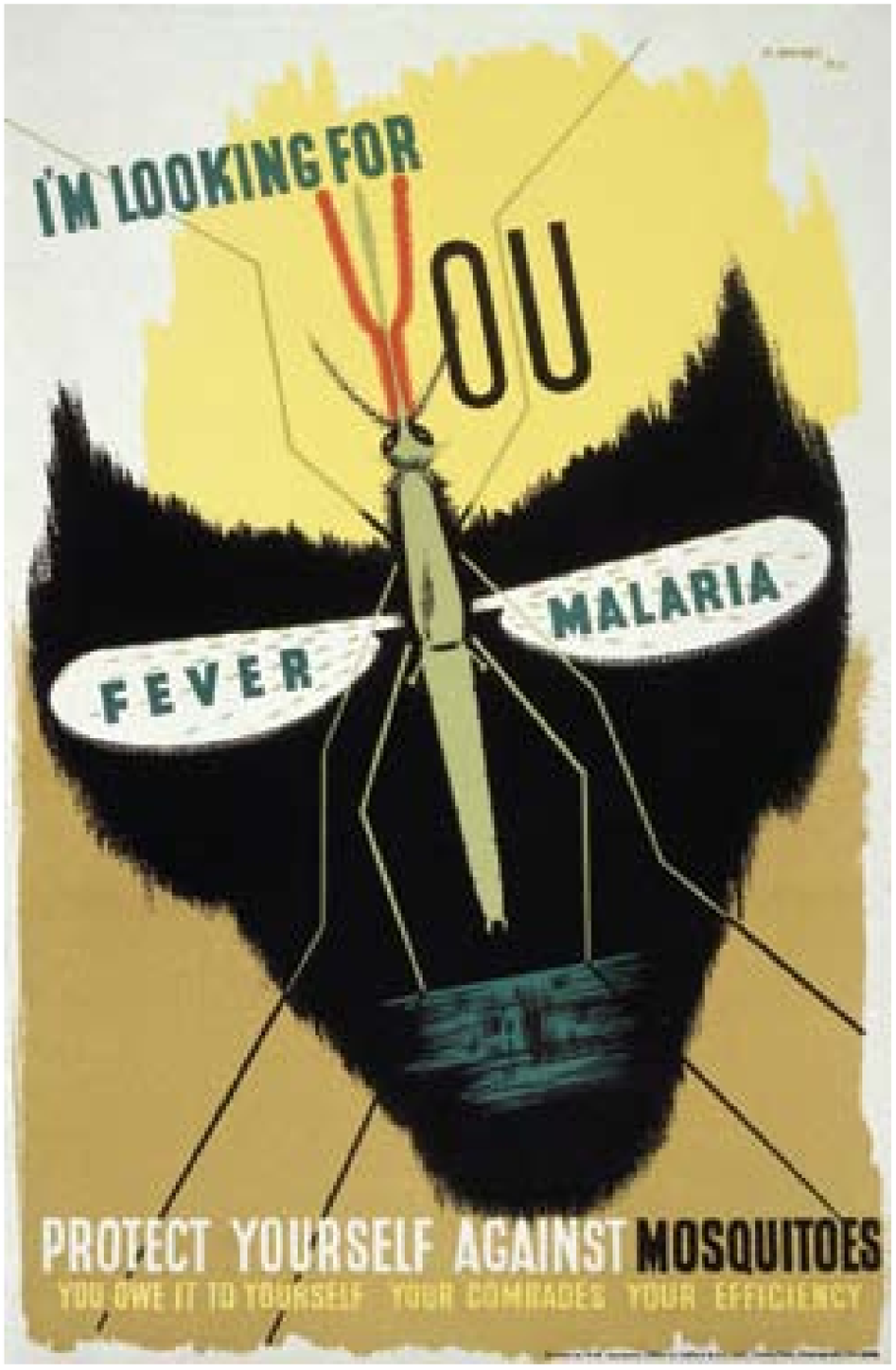
Abram Games

POSTERS

The following posters by Abram Games were commissioned by Her Majesty's Stationary Office, London, in the early 1940s, as part of a campaign to improve health and hygiene during the war years.


30 MINUTES OF YOUR TIME
BLOOD
NOW
DONORS
A LIFETIME TO SOMEBODY ELSE


THEY CARRY
disease
TO FOOD
FROM FILTH
KILL ALL FLIES
YOU OWE IT TO YOURSELF · YOUR COMRADES · YOUR EFFICIENCY


I'M LOOKING FOR YOU
MALARIA
FEVER
PROTECT YOURSELF AGAINST MOSQUITOES
YOU OWE IT TO YOURSELF · YOUR COMRADES · YOUR EFFICIENCY


KEEP YOUR FEET
Clean
YOU OWE IT TO YOURSELF · ·
YOUR COMRADES · YOUR EFFICIENCY · ·


R.A.M.C PARACHUTE UNITS
VOLUNTEER FOR THE PARACHUTE MEDICAL SERVICES. THERE IS A PLACE FOR YOU.
YOUR C.O. WILL FORWARD YOUR APPLICATION.


TALK IN HERE KILLS OUT THERE


NIGHT & DAY
BRUSH THE COBWEBS AWAY


COMMANDO MEDICAL SERVICE
VOLUNTEER THROUGH YOUR COMMANDING OFFICER

DANG THUY TRAM

LAST NIGHT I DREAMED OF PEACE

At the age of 24, Dang Thuy Tram volunteered to serve as a doctor in a National Liberation Front (Viet Cong) battlefield hospital in the Quang Ngai Province. Two years later, she was killed by US forces. Her diary was written between 1968 and 1970.

20 JULY 1968

The days are hectic with so much work piling up, critical injuries, lack of staff personnel; everybody in the clinic works very hard. My responsibilities are heavier than ever; each day I work from dawn till late at night. The volume of work is huge, but there are not enough people. I alone am responsible for managing the clinic, treating the injured, teaching the class.[1] More than ever, I feel I am giving all my strength and skills to the revolution. The wounded soldier whose eyes I thought could not be saved is now recovering. The soldier whose arm was severely inflamed has .... healed. Many broken arms have also healed All these successes are due mainly to the nurses and me working day and night at the patients' bedside ....

5 OCTOBER 1968

I lost an amputation patient. He was sixty years old but still strong, a veteran Party member who had been in the fight for 23 years. His family and the clinic staff tried their best, but we couldn't save the old man.

The community and his son accept that I did everything I could, but I am still painfully disappointed. Why did he die? Was it my technique? It wasn't that. Although it was my first amputation, I stayed calm and adhered to the surgical protocols. Then why? Was it the unsuccessful plasma transfusion? I don't know what to say: we got the vein, then missed it again and again because of the old man's continuous thrashing. What a tragedy!

Why can't I draw any lesson from this untimely death?

9 JANUARY 1969

Bon is 21 this year, 21 years, with seven battle injuries. This young scout-platoon leader has made an unforgettable impression on me.

The first time I saw Bon, he was admitted into the clinic with a minor injury in his leg. After a few days he left, even though his wound was not fully healed. Over a month later, I re-admitted him at the clinic. This time the wound was in his shoulder. He had lost a lot of blood, so he was very tired and pale. When he regained consciousness after the surgery, a playful smile bloomed again on his pale lips. It was a very painful injury, but he did not whine or moan. He worried about one thing: being able to continue fighting. During my visits with him in the patients' ward, I often brushed his hair with my fingers and whispered to him: "Don't worry, little brother. You can certainly still hold a gun well enough to fight the enemy."

Another day, I saw Bon in a marching troop, an AK-4782 on his shoulder. He saw me from afar and shouted cheerfully, "Greetings, Doctor! Report to Doctor: My arm is as good as new!". He waved his arm to show that the joint functioned normally. I laughed happily when I saw the healthy hue on his cheeks and the playful grin on the face of that liberation soldier.

Today, Bon is back at the clinic again, very pale. He lies motionless and silent, without a single moan. His leg is lacerated, mauled by a mine, his clothes soaked with blood. With love, the other comrades and I try our utmost to treat him.

After the amputation of his leg, Bon smiled and said, "Now survival is 80 per cent certain".

In private, I still worry because Bon lost so much blood. His pulse is very fast (140 to 150) but I am hopeful.

In the end, he cannot survive. Having lost so much blood, he lacks the strength to recover. Oh, Bon, your blood has crimsoned our native land, flowing down the length of the road to battle. Your heart has stopped so that the heart of the nation can beat forever.

Bon dies, his eyes closing gently as if to sleep. Sitting by his side, brushing his hair, I think he is still with us. Then my tears fall onto his hair. No! Don't die! You will live forever in my heart and in the hearts of your comrades who have fought at your side in this life-and-death struggle ....

13 MARCH 1969

Another comrade sacrificed his life. The wound went all the way through his abdomen. His condition was not good after the operation, and worsened over time. Perhaps there was an internal hemorrhage caused by some undiscovered shrapnel cutting a vein. After a joint diagnosis, the common opinion was not to perform a second operation. Privately, I hesitated. In the end he died.

I developed a severe headache, thinking about his death. Why did he die? Was it because of my indecision? Very probably. If I had been decisive, he might have had a ten percent chance of survival. I conformed to the majority's opinion and dropped something worth doing.

He died with a small notebook in his breast pocket. It held many pictures of a girl with a lovely smile and a letter assuring him of her steely resolution to wait for his return. On his chest, there was a little handkerchief with the embroidered words "Waiting for you".

Oh, that girl waiting for him! Your lover will never come back; the mourning veil on your young head will be heavy with pain. It will mark the crimes committed by the imperialist killers and my regret, the regret of a physician who could not save him when there was a chance ....

29 JULY 1969

The war is extremely cruel. This morning, they bring me a wounded soldier. A phosphorus bomb[2] has burned his entire body. This is Khanh, a 20 year-old man, the son of a sister cadre in the hamlet where I'm staying. An unfortunate accident caused the bomb to explode and severely burned the man. Nobody recognises him as the cheerful, handsome man he once was. Today his smiling, joyful black eyes have been reduced to two little holes— the yellowish eyelids are cooked. The reeking burn of phosphorus smoke still rises from his body.

His mother weeps. Her trembling hands touch her son's body; pieces of his skin fall off, curled up like crumbling sheets of rice cracker. His younger and older sisters are attending him, their eyes full of tears.

A girl sits by his side, her gentle eyes glassy with worry.

Clumps of hair wet with sweat cling to her cheeks, reddened by exhaustion and sorrow. Tu (that's her name) is Khanh's lover.

She carried Khanh here. Hearing that he needed serum for a transfusion, Tu crossed the river to buy it.

The river was rising, and Tu didn't know how to swim, but she braved the crossing. Love gave her strength.

The pain is imprinted on the innocent forehead of that beautiful girl. Looking at her, I want to write a poem about the crimes of war, the crimes that have strangled to death millions of pure and bright loves, strangled to death the happiness of millions of people, but I cannot write it.

My pen cannot describe all, even though this is one case I feel with all my senses and emotions ....

30 JULY 1969

At midnight, brother Ky arrives from the South Wing and gives me painful news: the enemy has mounted a surprise attack on the clinic. Young sister Lien was shot and killed while leading the injured to escape. Ky doesn't know who survived from the soldiers and who died.

Within three months, the clinic was attacked four times ....

29 MARCH 1969

For the first time, I dig a grave to bury a comrade. The shovel hits a rock, and sparks fly like the flame of hatred in my heart. Yesterday, returning from an observation assignment, Thanh was shot right at the stream on the path that led to my house. The enemy wounded brother Xuat and then they landed to take him away. His torn pants were left at the site... In less than three months, the organisation has lost three people!

The grave is not yet finished, but people are already carrying Thanh back. A day has passed, but blood still seeps from his body, soaking the wrapping sheet red. I cannot see his face clearly, but only a pair of closed eyes and pale face. Alive, Thanh had weaknesses that I didn't like, but now, shoveling earth to cover his body, I cannot hold my tears. That's the way it is. Try to love and care for one another when we are still alive, but when we are dead, crying is only tears on a lifeless mound of earth.

Originally published in "Last Night I Dreamed of Peace", Random House.

WHY THE PSYCHIATRY OF WAR IS TOO IMPORTANT TO BE LEFT TO PSYCHIATRISTS

Ben Shephard

What will be the psychological cost of the Iraq War? In their book, *The Three Trillion Dollar War*, the Nobel Prize-winning economist Joseph Stiglitz and his co-author Linda Bilmes put the overall medical bill for American veterans of the war at 660 billion dollars, with the lion's share going on mental health problems. This appalling statistic will surprise no one familiar with recent history. It represents the price America is paying, not just for a bad war, but for three decades of bad psychiatry.[1]

First, the war. More or less from the beginning, the fighting in Iraq has contained ingredients that, history tells us, magnify the incidence of psychological casualties. At the macro level, there has been poor political leadership, bad generalship (until the arrival of David Petraeus), an ill-defined military mission with no clear exit, and divided public opinion at home. All these elements have thrown into doubt the value of the soldier's task. At the operational level, the fighting in Iraq has seen the presence of civilians on the battlefield, the use of roadside bombs and improvised explosive devices, a high ratio of wounded to dead, a high proportion of reservists deployed, and above all, long (and repeated) tours of duty—all of which are reliable predictors of high psychiatric casualties because they cause heavy emotional debris. Furthermore, the shortage of available manpower has forced the Pentagon to drop its admission standards for recruits, lowering the intelligence criteria and issuing 'moral waivers' to people in trouble with the law; post-Vietnam experience tells us this will create problems down the line.[2]

So a bad war will have an aftermath. But Stiglitz's enormous bill has as much to do with the society to which Iraq War veterans will return, the culture of trauma created by modern psychiatry within which they will try to readjust, and the extraordinary dissemination of the concept of Post-Traumatic Stress Disorder over the past 30 years. To see this in its proper perspective we need to go back in history, to 1939.[3]

During the two World Wars in the first half of the twentieth century,

Chronic movements due to shellshock, 1916.
Photograph by Albert Norman.
Wellcome Library, London

whole societies had to live through traumatic events—combat, bombing, being captured as prisoners of war, losing loved ones, German occupation. This was not Freud and ten neurotic women in Vienna—this was entire societies. Out of this experience, a broad consensus was forged. Doctors and psychiatrists found, first, that it was best *not* to medicalise this process; not to give it medical names. That was the lesson of 'shellshock' in the First World War, when the public and the newspapers were allowed to think that there was an actual medical condition called 'shellshock'. The "medical method of handling", it was found, undermined the individual's ability to take responsibility for himself. Second, it was thought wisest to leave people to cope on their own; to respect the culture and the defences within it—humour, singing, alcohol, sex, ritual, ceremonial, religion, and so on—and, where necessary, re-inforce them. This was not a culture of denial. It was one that assumed that most people are healthy, robust and resilient and can come through pretty horrible experiences with social support. But, third, it was at the same time accepted that there would

Patient has his cigarette lit for him, 1940s.
Wellcome Library, London.

be casualties. The thinking was: in the first instance, just give them rest and tell them they are exhausted; get them back to work or soldiering and rely on them to cure themselves. If that didn't work, for the more serious cases there was a range of treatment techniques—in the First World War, hypnotic abreaction and dream analysis; a generation later, with the arrival of barbiturates, pharmacological sedation, sometimes combined with drug abreaction.[4] Fourth, the strongest predictor of outcome was thought to be the patient's pre-morbid personality *not* the level of exposure. Intelligence was also regarded as an important factor.[5]

It is sometimes said that medicine at this time was unaware of trauma. In fact, the textbooks of the time (such as that written by Sir David Henderson and RD Gillespie) contain many calm, wise pages on trauma—which is hardly surprising since their authors usually had wide experience of war and its aftermath—they just don't emphasise it.[6]

What did this mean in practice? One obvious example is the handling of psychological casualties in the London Blitz of 1940. The policy adopted then was worked out, at a conference in 1939, by a group of doctors who had all been through the First World War. It consisted of four strategies, which can be summarised as follows:

- Don't use quasi- medical words like 'shellshock' either to the patient or in the media.
- Don't pay pensions for 'war neurosis'; don't reward the neurotic.
- Keep psychotherapy to a minimum and rely on social pressure.
- Use personnel selection to keep vulnerable people out of the forces.

In line with this approach, civilian air-raid victims in 1940 were simply told that they were exhausted, that there was nothing wrong with them and that they should go back to work; very few were given pensions at the time and elaborate treatment was discouraged. All of this resulted in the very brisk treatment given to air-raid victims. Patients at the London Hospital were told that their reaction was due to fear, that that fear was one they shared with all other patients and with the emergency workers, and that it was important that they return to their normal work and resist the temptation to exaggerate the experiences through which they had passed. In other words, civilians were not *allowed* to break down. Social pressure was used to reinforce the idea that there was nothing wrong with them. Meanwhile, the media promoted a powerful 'London can take it' mood, which carried people along.

I am not saying that this was a golden age of psychiatry—the era of ECT and of leucotomy; a period when people with learning difficulties, or young girls who got pregnant might find themselves confined to a mental hospital for life. There were wartime failures, too: most notably, with those who returned from Japanese Prisoner of War camps. The tough regime applied to the London Blitz patients was passionately opposed by some younger doctors at the time, who thought it was heartless and cruel. (When the psychoanalyst John Rickman tried to organise a conference of psychiatrists, he was bluntly told by the Psychiatric Consultant to the Emergency Medical Services, Dr Bernard Hart, that the Ministry of Health had no money for such conferences.) But I do believe that in relying more on the culture than on medicine, this generation of doctors made a wise decision.

What about that culture? Nowadays, we tend to see it in very stereotyped terms derived from old movies—stiff upper-lips and so on. In some ways, it *was* a little comical. There was also often a strong racial element within it that we would find unacceptable today. The great strength of this culture, however, was that it offered the ordinary person a simple, straightforward, clear model of how to carry himself in adversity: he knew, for example, that to weep in public was to show weakness. And, although this code of behaviour is sometimes depicted as a form of social control imposed from above (like the British Empire and the 'Public Schools' system) it was, in Britain at any rate, as much rooted in popular working-class culture as in middle-class social conformity. One of its most important attributes, of course, was a distaste for psychiatry. "The majority of men, especially in this country", a British officer wrote in 1946, "are healthily devoid of any interest in

psychiatry (which) is regarded as a queer interest for queer people". There was also, he thought, "a revulsion against the invasion of mental privacy which is unavoidable in prolonged psychiatric investigation".[7]

In the late 1950s, these social values, which had long been under strain, began to break down; they have continued to erode ever since. At the same time, the epicentre of our culture began to shift to America—and to Nashville, Memphis, Detroit, Hollywood and Orlando as much as to New York or Boston. The net result has been a change in the role of emotion and stress in Anglo-Saxon public culture, which has been lucidly summarised by the American historian Alan Brinkley. "Where once society organised itself around a cluster of powerful and widely shared values, many of them emphasising restraint, self-discipline and personal responsibility", Brinkley has written, "now it is dominated by a new and more permissive ethos that emphasises personal fulfilment, desire and identity". A "set of essentially bourgeois standards, rules and truths" has been displaced by "what was once a dissenting subculture, the world of the bohemians of the early twentieth century … and the countercultural Left of the 1960s". Conservatives have argued that "while some good things came from these changes, most notably, perhaps, the assault on racial injustice—most of its results had been dismaying and socially destructive"; others feel the gains have outweighed the losses.[8]

The effect of this shift in values first became apparent in Vietnam. The great unresolved mystery of the Vietnam War is the extraordinary contrast between the psychological literature at the time —which, by and large, has a note of complacent satisfaction ("psychiatric casualties are lower than in any previous war")—and the torrent of writing in the two decades after the war, which mostly claimed that Vietnam veterans were more damaged, more screwed up, than survivors of any previous war. There have been many conflicting explanations for this—that the Army psychiatrists were too smug, careerist, and far in the rear to know what was really happening; that the widespread availability of drugs led to a numbed state of mind from which many soldiers only emerged years later;

Wounded servicemen arriving from Vietnam at Andrews Air Force Base. Photograph Library of Congress.

that, because Vietnam was an unpopular war, soldiers afterwards came to feel guilt about what they had done there; or that anti-war psychiatrists projected onto veterans their own feelings about the war.

Vietnam divided American society—and American psychiatry. By and large the dominant figures in the profession, the grand, articulate, Ivy League doctors, were against the war—"outside the tent pissing in", in Lyndon Johnson's famous phrase—and it was left to the hacks working for the military to defend (and apply) the traditional line. In order to prove that America's veterans were uniquely screwed up, the anti-war psychiatrists seized on the rhetorical weapon of trauma: they moved trauma centre stage, made the pathological the norm and, in the process, threw away the hard-won store of knowledge accumulated during the twentieth century. They knew better.

One reason for this was that the issue of the Holocaust had belatedly, nearly two decades after the liberation of the Nazi death camps, begun to influence psychiatry, as physicians in New York, Boston, Chicago and Detroit became involved in a campaign for survivors' compensation against the West German government. Historians may argue over whether the Holocaust was a unique aberration or just one of countless examples of genocide and savagery in the twentieth century. But in the context of psychiatry, no such debate ever took place. The Holocaust was admitted to the trauma equation in the late 1960s and early 1970s by American psychiatrists who would have felt it impossible to exclude it. And their patient population provided them with solid and tangible evidence of the after-effects of trauma—of the "survivor syndrome"—nightmares, flashbacks, depression, anxiety, and

so on—which had a profound effect on them. Thus, the Holocaust experience created a new professional model: the psychiatrist as patients' advocate, helping a group of wronged victims to win reparation. This popularised the idea of a general, loosely defined 'syndrome' among a group of patients, made the idea of delayed emotional after-effects of trauma respectable, and put guilt, especially survivor guilt, on the agenda. Most important of all, it shifted the balance between trauma and victim; thereafter the emphasis was more on victimhood and less on endurance.

It is worth emphasising, however, that this is the only aspect of European experience in the twentieth century that American psychiatry has ever really taken on board.

Vietnam; the Holocaust: as if that wasn't enough, American psychiatry at this time also underwent a dramatic paradigm shift—away from the psychoanalytic approach dominant since the Second World War towards a more biological, 'scientific', 'objective', neo-Kraepelinian model, promoted especially by a group in St Louis, Missouri. These doctors wanted to replace what they saw as the current chaos in psychiatry with a more consistent, uniform kind of medicine based on generally agreed, scientifically replicable, systems of classification—a nosology based primarily on symptoms. (This tidier world was of course more convenient for the drug companies and the medical insurers.) Far from being deflected by this paradigm shift, a group of psychiatrists working with Vietnam War veterans brilliantly exploited the opportunity it provided—to establish in the new *Diagnostic and Statistical Manual (DSM-III)* the classification of Post-Traumatic Stress Disorder, intended to cover the problems of the veterans and to help them secure assistance from government and insurance companies. They did it by a shrewd combination of lobbying, solid argument and emotional blackmail. And so, in 1980, PTSD was born.

The authority conferred by the American Psychiatric Association's imprimatur played an important part in the astonishingly rapid acceptance of Post-Traumatic Stress Disorder, not just within the American medical community

Patient suffering from war neuroses. From Arthur Frederick Hurst, *Medical Diseases of the War*, 1918. Photograph by Edward Arnold. Wellcome Library, London.

but by medicine, the media and the law-all over the world. As Derek Summerfield has written:

> The mental health field rapidly accorded PTSD the status of scientific truth, supposedly representing a universal and essentially context-independent entity. This was to say that from the beginning of history people exposed to shocking experiences had been liable to a psychiatric condition which only in 1980 had been fully discovered and named.

Because Post-Traumatic Stress Disorder, as set out in the new bible of psychiatry the *DSM-III*, created a standardised model of how victims respond to trauma—a "single common syndrome that appears to be the final, common pathway in response to severe stress"—it made it possible for doctors working with Vietnam veterans to unite with those treating other forms of trauma and stress—rape, child-abuse, road accidents, torture—to create a 'trauma movement', which soon acquired an ideology. It aimed to bring into the open society's "collective secret" and to reverse decades of wilful ignorance of traumatic acts and denial of post-traumatic suffering.

But the trauma movement was not just about theory; it was going to transform practice. Greater "consciousness of trauma", it was believed, would make possible a greater ability to treat it. And here, nearly all the traditional wisdoms were stood on their heads, the old culture ignored.

Now they said:

- You must *not* leave the traumatic victim alone. Armed with the new insights into trauma, you must give him active preventive treatment—debrief him. ('Debriefing' techniques, developed in the 1980s, required trauma survivors to be formally gathered together to talk through their experiences in the presence of a trained counsellor. By working through the traumatic emotions, they would be able to resume their lives without having trapped traumatic memories. Large numbers of people with no direction in life began retraining as 'trauma counsellors'.)

- It was *not* previous personality that mattered; it was the *magnitude of the stressor.*

- Intelligence was *not* an important factor. (The issue of intelligence had become politically incorrect and unmentionable because the American Army had not given intelligence tests to troops sent to Vietnam.)

- And not only did you give the condition a name, you published a checklist of its symptoms for everyone to read. Symptoms mattered.

- Finally, thanks to America's guilt at sending thousands of young men into a dirty, un-winnable war, millions of dollars were spent on research to establish the biological causes of trauma, which suddenly became the biggest growth area in psychiatry.

Why was PTSD so rapidly accepted all round the world? In Britain, circumstances played an important part. What had been for two decades a medical backwater was suddenly transformed in the 1980s by the Falklands war and the extraordinary spate of man-made disasters—train wrecks, aeroplane crashes, oil-rig fires—that killed over a thousand people in less than four years, all of these horrors reported in detail on television. By the end of that period, most of the main London psychiatric hospitals had established 'trauma clinics'. The role of the media was also important. Long reliant on getting new medical stories from America, it took the rhetoric of the trauma movement at face value: PTSD was presented as a great breakthrough in medical understanding, bringing with it new treatment techniques.

The ideology of PTSD did not simply conquer Western Europe. It was exported to the Soviet Union and to the Developing World. By the 1990s, western 'experts' working for international agencies were using 'trauma programmes' that assumed that there was a "universal trauma response" that could be measured by giving victims a checklist of symptoms developed by American PTSD doctors. UNICEF workers surveyed 3,000 Rwandan children using the 'Impact of Events Scale' and the 'Grief Reaction Inventory', concluding that they had high levels of PTSD requiring immediate treatment.

As it turned out, however, the early 1990s constituted the high-water mark of the trauma movement. Soon afterwards, theoretical and practical problems began to appear. On the theoretical side, the American anthropologist Allan Young was the first person to put PTSD into its proper historical perspective. He concluded that:

> The disorder is not timeless, nor does it possess an intrinsic unity. Rather it is glued together by the practices, technologies, and narratives with which it is diagnosed, studied, treated, and represented and by the various interests, institutions, and moral arguments that mobilized these efforts and resources.

Young's book, *The Harmony of Illusions*, had a wide impact. It reminded psychiatrists of something they seemed temporarily to have forgotten—that they were social beings, working within a social context. It also coincided with growing evidence that the clinical practices developed by the 'trauma movement' were not working.

The PTSD doctors were like spoilt teenagers discovering sex for the first time: they thought no one had ever done it before. Most had little clinical experience of their own and few made much attempt to understand the overall clinical record of the past. However, by the late 1990s, these doctors had acquired some clinical experience of their own. They found:

- That debriefing didn't work. It was better to "respect the patient's coping strategy".

- That a patient's previous personality, *not* the magnitude of the traumatic stressor to which he was exposed, determined outcome.

- That trauma did not necessarily cause neurosis.

- That intelligence is important.

- That "giving it a medical name" might undermine the individual's ability to take responsibility for himself.

- That America's Vietnam veterans had not benefited from the "invention of PTSD". Far from curing the problems of Vietnam veterans, the provision of outpatient clinics had increased the number of those with PTSD. American society had offered its ex-servicemen the role of the 'dysfunctional veteran' and thousands were happy to take it.[9]

In other words, this medical generation had spent 20 years learning what most European doctors knew in 1950—that many patients are suggestible; that it is often better *not* to medicalise problems; that doctors need to be wary of how their diagnostic systems will be taken up by the broader society; and that to publish a list of symptoms and then offer compensation to those who suffer from them is tantamount to an invitation to malingerers, fantasists and highly suggestible people to develop those symptoms.

So, did the psychiatrists offer a collective apology? Rewrite their textbooks? Of course they didn't—in this litigious age. Anyway, by then it was too late; the damage was done, the genie out of the bottle. While the PTSD doctors had been completing their education, trauma had been vectored into the society by the media and seized on by the law. Counsellors were busily spooning half-digested PTSD down their clients' throats. Latterly, smarter journalists and lawyers have realised that PTSD is just a phrase that brings no magic bullet; but in the popular culture that idea is still propagated. 'Trauma' has become one of the staples of daytime television and magazines, the cheapest form of drama. The emotions provoked by fear and stress have long since ceased to be private and shameful; now they are commodities to be traded in the marketplace of deregulated television and popular journalism. The experience of trauma has become intertwined with the values of the entertainment industry, and what used to be seen as the normal experiences of life are now seen as quasi-medical traumas.

Over the last decade, the intellectual initiative has passed from the proponents to the critics of PTSD. Many of its fundamental assumptions have come under sustained attack, not just from psychiatrists, but from anthropologists, historians and philosophers, even as the definition of PTSD in the *DSM* has undergone three revisions, losing in the process even more of its coherence. For example, the 'traumatic stressor' causing the damage was defined in 1980 as being "outside the range of usual human experience", but by 1994 it had widened to include almost any traumatic experience. One study found that, as a result of this category creep, 90 per cent of adults in the Detroit area had been exposed to at least one traumatic event, yet only 9.2 per cent had developed PTSD.[10]

Mainstream American psychiatry has given some ground in the face of this onslaught. Firstly, it is now accepted that there is a cultural element in the response to trauma and some of the universalising fervour of the 1990s, when symptoms checklists developed in San Francisco were confidently exported to, say, Rwanda, has subsided. Secondly, since 2000 there has been a new emphasis on 'resilience'. In 2006, the American Psychiatric Association announced that "a traumatic event alone is not a sufficient cause of PTSD and PTSD is not the most frequent response to traumatic events", without, of course, accepting responsibility for previously asserting otherwise.

But, for all that, the concept of PTSD remains unassailable. Much of the response to criticism comes in the form not of reasoned intellectual debate, but of personal abuse and moral blackmail. Why is this? Partly, it is chauvinism: an American belief that no one understood this problem before 1980. But, more importantly, the current of political advocacy that lay behind the creation of PTSD in the first place has been reignited by the Iraq War. Opponents and supporters of President Bush are once again using the issue of military

Opposite Vietnam Veterans Memorial, Wahington, DC. Photograph Todd Gipstein collection: National Geographic

psychological casualties as a political weapon. It has become unthinkable that psychiatrists who have three decades of emotional and bureaucratic investment in PTSD should abandon the diagnosis now; to do so would be to lose faith with the Vietnam veterans whom they have championed for so long and to undermine the bureaucratic raison d'etre of the institutions that pay their salaries.[11]

Secondly, the dominant model of how trauma works, which in the 1970s was neo-Freudian, has long since been decked out in the clothing of modern neuroscience; this enables the proponents of PTSD to offer bold (and so far unprovable) hypotheses in the language of modern neuro-babble.[12]

Thirdly, PTSD is now embedded in the culture. It has been taken up by the

Above Vietnam Veterans Memorial, Washington, DC. Mediaimages/Photodisc, courtesy Getty Images.

media, lawyers, veterans' groups and the general public, for all of whom it serves a useful purpose. PTSD, we are told, is the one psychiatric diagnosis patients like, because it takes away personal responsibility for one's psychological state and shifts it to an external 'event'. The media reporting of the Iraq War has routinely reiterated the long-questioned (and inherently absurd) finding of a 1988 survey that one in three Vietnam veterans have PTSD—inherently absurd because many fewer than one in three soldiers served in the front line there.[13]

All in all, it is not just America's foreign policy chickens that are now coming home to roost. We are also seeing the consequences of allowing psychiatry (and the professional interests of psychiatrists) to dictate social policy. The contradictions that this can produce are now apparent. At the time of writing, veterans' groups and sympathetic clinicians are fighting to get proper psychiatric treatment for Iraq War veterans, but their care is being held up by the number of Vietnam-era patients choking the system. Meanwhile, a review of treatments for PTSD carried out for the National Academy of Sciences by a panel of nine eminent psychiatrists has concluded that the evidence does not make it possible to say whether or not any of the treatments for PTSD are effective.[14] So what will all the billions of dollars be spent on?

ANONYMOUS

LIVING WITH PERSONAL DRAGONS IN YOUR DAILY LIFE

This veteran of the Vietnam War wishes to remain anonymous

At the present time, I have a Veteran's Administration Service Connected disability rating of a hundred per cent based on PTSD. The primary trauma accrued within a 48-hour period while on active duty in Vietnam. During this time I, along with my unit, was bombed by our own B-52s. Ended up walking next to an unexploded 750-pound bomb. Then walking into an ambush that took most of the lives within my unit and watching while rescue helicopters were being shot down trying to remove me and other wounded from the battle zone where I had received combat wounds ....

Since leaving the Army, I have found life difficult and trying. Many times over the last 30 years and even more often in recent times, I have felt that ending my life would be best solution for me. After losing my teaching job at a college I returned to the travel industry where I have been employed for most of my adult life. But only after a short time (three months) I lost this job because of an angry outburst on my part. I have looked back on my life and feel that I have accomplished little in my life, my depression has taken its toll, and I'm very tired because of this depression.

Through therapy I am learning to recognise many of my PTSD problems (Dragons) that I was not aware of before starting. These symptoms... have been so much a part of my life that I did not recognise them as being out of the ordinary. Since November 1996, I have emotionally continued on a downward spiral fighting this ingrained PTSD.

I will emphasise my deficiencies in the areas of work, family relations, and lack of anger management, plus other areas. I am unable to accept authority in the workplace, which is very stressful to me and I get feelings that it's necessary for me to change jobs because of the lack of satisfaction where/when I have worked.

Even though I've had many personal relationships, lasting several months, I still feel that I am isolated from people and the communities that I have lived in. I feel that every time that someone has tried to be a friend, I push them away so that they don't learn of my past or for fear of losing them later as it happened so many times during my tours of duty in Vietnam ....

For most of my life I have lived within a closed world. I have only one true friend, who is also a Vietnam vet, and I do not allow people to get close to me. This way I do not expose myself to inquiry about the war or the part that I played in it.

For the last 30 years I have not lived a normal happy life.

I have repeatedly moved around the country looking for the 'right' place to live, never being happy in any one place for longer than two years. I've been married three times. I've had 20 plus live-in girlfriends plus hundreds of short-term/one-night relationships. It seems that anytime a woman tries to be close to me emotionally I push them away and I look for someone else. I try to find contentment, satisfaction and happiness with women but all it turns into is sexual gratification and escapism...

I am always looking for a better life, the right woman to be my wife, a better job, or place to live. I have, for many years, believed that I won't live past the age of 62. It's my belief that I will not retire like normal people do ....

Within this 30-year time frame I have had and lost many jobs, quitting most of them, and I have never been successful in the business world. I feel that I have had many good ideas but have never followed through with them to completion. The fear of success can be overwhelming ....

During several times of great stress or anger, I have lived in isolation away from everyone, preferring to live in the mountains. I am much more comfortable living in small towns and even more so in a rural setting like a farm or ranch with no neighbors close by to my family or me.

Anger is the main controlling force in my life and I use it as a tool to protect myself from harm, which has accrued or may accrue in my life since Vietnam. This perceived danger can happen even in my life today and has been reflected in daily events as simple as yelling at people for blocking an aisle at a store while I'm trying to pass by.

I must admit that I do spend time confused as to the date, place or time that I'm in. Finding it necessary to rely on others for appointments, I'm usually at least a day or two off but it's not uncommon for me to be at least a year off when trying to remember events in my life. While teaching, it was necessary for my secretary to keep track of events

I needed to go to since I would forget where I was supposed to be....

I have been in combat situations over six times. Since going into the Denver PTSD program even more events and their related flashbacks have been added to my memory as each recollections happen. Each flashback event presents me with their own images and many are now on a daily basis. Most flashbacks are vivid when they occur. With people dying, trees blowing apart and my fears and terror. Some are seen as incomplete events and I'm not seeing all that had happened nor with other people in them. Other visions are only images viewed through a small window of the fight. Many nights I find it hard to go to sleep, stay asleep or I wake up with cold sweat nightmares that I do not remember.

I have to live with anger and irritability on a daily basis. I am now dealing with frustrations over my 'missed' life, a life that I've craved for and will never have now because of my age. I am bitter with the government and the Veterans Administration for the lack of insight into PTSD and the effects that it has had on my life as well as others that experienced Vietnam and the reactions of people upon my return from service there. When PTSD became a recognised disorder... I personally feel that not enough effort was made to evaluate Vietnam Veterans for PTSD.

I do have a BA degree in geography. The major difficulty is that it is very non-specific in subject content and has not provided me with useful tools for outside employment after graduation. But now I feel so discouraged and depressed in life I will not go any further in my education. This is based on my lack of concentration, retention of material, memory problems, plus personal concern in my ability to study and learn.

During my time in Vietnam I got into the habit of going to sleep on my left side. The reasoning for this is to get my heart as close to the ground as possible. We had the feeling that during an attack the first rounds from the VC would be high so I wanted to protect myself as best I could. That is one habit that has carried over to today and I still make every effort to go to sleep on my left side ....

One of the most vivid dreams and recurring dreams deals with my exposure to leeches after being hit and lying in a rice paddy for a night. When I woke up

I had many, many leaches on me. I spent almost an hour looking for leeches then burning them off of me with cigarettes.

First, flashbacks: I experience them. They can occur for no reason and without warning, coming from out of nowhere, or during times of stress. Secondly, sounds: Sometimes with a backfire, helicopter fly-bys, hail bouncing on a roof, close hitting lightning or distant thunder will produce a flashback. I return to Vietnam and my experiences come back to me. Thirdly, smells have an effect on me: There are several smells that can cause an event but the most forceful smells are: diesel fumes from truck exhaust or the smell of vomit ....

I wish to list here my aversion of being in any crowd or people in general. I do not like, nor enjoy crowds of people. This includes movie theaters, cafeterias with long lines, long lines of any kind, sporting events, or malls. A simple example of this is that I did not go to any of my school graduations while in college. It seems that I'm always on guard!

CHERYL LYNN RUFF

RUFF'S WAR: NAVY NURSE ON THE FRONTLINE IN IRAQ

Cheryl Ruff had spent 25 years in the US Navy, providing patient care in naval hospitals around the world, before she was sent to the frontlines of the 2003 war in Iraq as the only female nurse/anaesthetist in the Bravo Surgical Company. They followed directly behind the First Marine Expeditionary Force as it entered Iraq at the onset of Operation Iraqi Freedom.

APRIL–JULY 2003

As soon as the choppers began to arrive, I was ready to administer anesthesia in OR (Operating Room) number two. Both Lieutenant Commander Sheppard, my battle buddy and fellow nurse anesthetist, and I had been assigned as the anesthesia providers for this OR designated to care primarily for those with chest, abdominal, and head injuries. OR number one would care for those who had sustained orthopedic injuries. We knew most of the wounded would have multiple injuries, but if the primary wound had been sustained to the chest, abdomen, or head with secondary wounds sustained to the limbs, the patients would have surgery performed in OR number two. If the primary wound was orthopedic, the individual would have surgery performed in OR number one ....

I performed my first anesthesia procedure using field medical anesthesia equipment that consisted of a vaporizer with tubing that extended from the vaporizer to a mask placed over the patient's nose and mouth. Midway along the length of this tubing was a reservoir bag that I would manually squeeze in order to provide oxygen and anesthetising agent/vapors to the patient. In essence, I was breathing for the patient ....

One of my patients was an Iraqi man who had been shot in his abdomen. His colon had been ruptured, and his abdominal cavity was filled with human waste. For some reason I could not maintain adequate oxygen saturation for him despite my constant manual ventilation. A chest tube had been inserted and connected to suction, and there was no evidence that the patient was bleeding from a thoracic injury. Still, I knew something was not right. The patient's oxygen saturation level, which should have been 95 to 100 percent, had fallen to 89 percent ....

A decision to stop the abdominal procedure and open the thoracic area was made. It was a drastic decision, but a necessary one. Once the chest was opened, we saw a tennis ball-sized hole on the upper portion of his right lung, and he was oozing blood. I was ventilating him, but the oxygen was not entering his bloodstream; instead, it was being blown out through this large, gaping hole in his lung ....

Once the surgeons saw this devastating, fatal wound, they looked at one another and said, "This surgery is over. We can't help this man anymore.'

I looked at Commander Fontana and said, "It's over? What am I supposed to do?"

"You've got to let him die, Cheryl", he said, and began backing away from the table.

The only thing that was keeping this man alive was my effort to ventilate him continuously by squeezing the anesthesia reservoir bag. I was breathing for him, and his life was literally in my hands.

The surgeons stopped the procedure, moved away from the table, and removed their gowns. Still, I could not stop squeezing the bag. This was not something one learns in anesthesia school, and I was not prepared for such a gut-wrenching, decisive, and final act. The OR nurses began cleaning up, and all the surgeons had left, but I still continued squeezing the bag. I could not stop myself despite the continuous decline of this man's oxygen saturation levels. I realised that he was dying, that his brain was being deprived of oxygen, and that nothing more could be done to save his life. Still, I continued to squeeze the bag.

A few of my colleagues entered the OR and said, "Cheryl, the surgeons aren't coming back. We're done; it's over". Still, I continued to squeeze the bag. I needed time to convince myself that I had no choice but to stop this man's life. I was fully in charge of him at that moment, and my action was the only thing sustaining his life.

As I sat there, I experienced a memory flash from a time when I was stationed on board the USNS Mercy. We had talked about what we would do if the ship was hit by enemy fire and we had no way of taking our patients to safety before the ship sank. We did not want them to experience the abhorrent death by drowning, so we developed a plan where we would dose the patients with morphine to provide them with a peaceful death before they went down with the ship.

That memory gave me the strength I needed. I administered ten milligrams of morphine to my patient and began to slow the rhythm with which I was squeezing the bag. Eventually and very gradually, I stopped squeezing the bag. My patient was dead. I could only pray that his death was a peaceful one.

I then asked the OR nurse to get Commander Fontana to come back into the OR and officially pronounce the death of this man. When she returned, she said, "Cheryl, the doctors can't come back in right now. It's your call". This task was way beyond the normal scope of duties and responsibilities for a nurse anesthetist, but we were not functioning in normal times. I pronounced his death, and as I completed my anesthesia record I wondered who, if anyone, would ever read it. I was emotionally exhausted and physically spent.

When Iraqi civilians or EPWs died or arrived at the camp dead on arrival, we would take whatever identification we could find on them and send it to the Iraqi government. Their remains were taken to a trench on the far side of the road that bordered the camp. They were then placed there with deep respect in accordance with their religious customs. The precise location of their remains was recorded using the global positioning system, and that location was reported to the Iraqi government. Following the demise of my patient, I could do nothing more than watch as the corpsmen gently and respectfully removed this man from the OR and took him to his final resting place, the trench on the other side of the road.

Despite the heart-wrenching experience I had just endured, my work was far from complete. More casualties arrived, and we soon realised that this war was not one in which only the fighting troops were being killed and injured. A nine year-old boy arrived with half of his face blown off. Where he once sported a nose was now nothing more than shredded tissue. His right eye was gone, as was most of the right side of his face. He was in excruciating pain, had only half a mouth, yet he cried, screamed, and called out for his mother. Even though he spoke a different language from our own, the cry for "Mom" was universal. We knew what he wanted and what he needed, and we did

everything we could to comfort him.

I saw this young boy in the triage area, where he was being evaluated by anesthesia because of his seriously impaired airway. We had little pediatric equipment On our Authorised Minimum Medical Allowance List (AMMAL) because children are not considered to be frequent victims of war. Fortunately, a small endotracheal tube was located, and Captain James Chimiak, an anesthesiologist, expertly inserted it with his skilled hands. The vision of that helpless, innocent, mangled child still haunts me and will remain with me forever in my dreams and in my nightmares ....

By early morning on the second day after our arrival at Camp Chesty, both OR number one and OR number two were set up and ready to receive patients. Once again, both ORs were austere. Each featured a dirt floor, two OR tables placed head-to-head, and poor lighting. Neither room had air-conditioning for several days. With the temperature often reaching 110 degrees during the day, we would open the tent flaps when we were not performing surgery just to let in some air and diminish the stifling heat of the interior. Unfortunately, when we opened the flaps, we could not prevent flies, bees, and mites from entering. Although we tried to keep the OR environment as clean as possible, flies were everywhere, buzzing over surgical fields and open wounds. All our patients received hefty doses of antibiotics ....

The wounds we saw and the stories of how the injuries occurred were horrific. We provided care to our wounded marines, EPWs, and noncombatant civilians, never turning anyone away and providing the same standard of care for all....

One day a middle-aged Iraqi man was brought into OR number two after having sustained a significant injury to his arm from a blast. We were told that he, along with two other foreign nationals, had attempted to run through a marine barricade. The other two men riding in the vehicle with him had been killed instantly. As we prepared this man for surgery, he told me he was a civilian pharmacist. I was amazed at how well he could both speak and comprehend the English language. He was well educated, and he discussed with me the actions, indications, and compound structure of various medications I was administering to him. I did not question his story or his alleged status as an Iraqi civilian pharmacist, for he seemed well versed when it came to pharmaceuticals. Still, I found it curious that someone who seemed to understand English to the degree he did would choose not to heed the marines' command to stop when approaching the barricade.

After I had administered anesthesia to him and while the surgery was taking place, other members of our company inventoried his clothing and personal effects. When they found his identification, they were shocked, as was I. He was a three-star general in the Iraqi Republican Guard. I no longer viewed this person whom I was breathing for as a fellow health care 'civilian' provider. He had lied, and we realised that we could not be as trusting of those coming to us for care as we wanted to be and that we needed to keep our guard up.

Initially I thought, "How dare this man lie to us?" and it made me angry. Still, I knew I could not allow my feelings to overtake my duty and responsibility to render the best care I was capable of providing. I put my emotions aside and continued to provide him with the same professional standard of care afforded to all who were brought into OR number two. The general survived the surgery, and because of the change in his status from foreign national to EPW (Enemy Prisoner of War), he was transferred to the recovery ward and, like the other EPWs, shackled to his cot and watched by a marine armed with an M-16 rifle.

Our feelings of resentment toward the EPWs for whom we provided care grew as we witnessed the horrible, devastating wounds and injuries sustained by our young American fighting troops. As health care providers and human beings, we fought to curtail these feelings of resentment and hate. Despite this tumultuous emotional battle that raged deep within us, the care we provided to the patients who were brought to us would continue to be equitable for all.

We did make a few logistical modifications in care provision to diminish tensions between our troops and the EPWs for whom we provided care. At no time, whether they were in a chopper, the OR or the postoperative ward, were the Americans and EPWs housed together. To prevent cross contamination of potential infectious diseases inherent in the various cultures, we separated the anesthesia equipment we used and designated the items either 'EPW' or 'American.' We never used the same anesthesia equipment on EPWs that we used on our American troops....

Bravo Company continued to care for a total of 667 patients, 63 of whom required more than one hundred intricate and convoluted surgical procedures. The injuries were traumatic, bloody, and debilitating, but no member of the US armed forces brought into the ORs for surgery died. They all survived and were transferred to an EMF.

We had worked long and hard and were pleased with our success rate. We were also proud that we had the opportunity to be working in the service of our country and especially proud that we were able to save the lives of so many of our brave American fighting men.

Originally published in "Ruff's War", Naval Institute Press.

ROBERT ACOSTA

ARMY SPECIALIST: IRAQ WAR SERVICE

At the age of 20, Robert Acosta, from Santa Ana, California, served as an Army Specialist in the US Iraq War Service, from April to July 2003.

APRIL—JULY 2003

I joined the army for a few reasons. I wasn't doing well in high school, so I dropped out. I was working little jobs, whatever, using drugs and stuff. I was going nowhere fast and just wanted to get out. There were no opportunities, and I didn't want to go to school. I didn't even want to finish high school. It was boring. You could tell the teacher didn't care, and I got discouraged. A good friend of mine had just come back from boot camp, and he was talking about it. I wasn't doing anything, and so that's why I joined.

I signed up when I was 17, in October of 2000, but I had to wait because I had to get my GED. I finally got that, then had to wait some more. I left for boot camp in August 2001, a month before 9/11. I was 18. After 9/11, I was like, "Shit, we're going to war". We flew into Kuwait City in April 2003. Things had seemed to be dying down; they were saying it was the end of the war. I was an ammunition specialist and was finally doing the job I was trained for. I was stationed at Baghdad Airport and the area surrounding it. We mostly had indirect fire, a rocket here and there. It wasn't like a shootout type of thing.

I didn't care about Iraq. I was in the army. We were just focused on doing what we had to do and then going home. When we were in Kuwait, soldiers were passing out left and right because there wasn't enough water. We had to go to other units and steal their water. Once we got to Iraq, it was even worse; the water wasn't coming in.... It was really unorganised. I didn't get my body armor until a week before I got injured. We had old flak vests. They then gave us new ones, but they didn't have plates. We made our own armor with cans. We'd flatten them out. You get mad, but there is nothing you can do about it. You can't bitch to your chain of command because they would tell you just deal with it, so you just dealt with it.

The day I got injured was my day off. I was hanging out .... We decided to go out and pick up some stuff for my soldiers... We were going to buy sodas and ice, which is like gold out there.

So we go and drive out, past the airport, and on to the airport road, which was called 'IED (improvised explosive device) alley', and the neighborhood of Abu Ghraib .... As we drove, we both kind of noticed there was no military presence. We were the only humvee in this neighborhood, and I was like, "Fuck this. Let's make a U-turn and go back". People were starting to come out of their houses and staring at us. We tried to get back onto the airport road, but then the car in front of us stopped, and then there were people standing on each side of the vehicle. All of a sudden through my window, which was open, I see it—a grenade was thrown into our vehicle, between the driver's seat and me. I grabbed it. I knew what it was. I grabbed it with my right hand and threw it out, but I fucking dropped it back in the humvee. I reached down again and grabbed it, and it popped. I almost got it out. My hand was gone automatically. My leg was all fucked up. I was still conscious. My friend didn't get hurt at all. We started shooting. I tried to fire a round. It was the first time I'd fired a gun in Iraq. So there is this car in front of us; people are yelling. It's fucking chaos, dude. I'm like, "Let's get the fuck out of here". I put my hand out the window because I don't want to see it. My friend hits it, pushes about three or four cars out of the way, and he is running people over. We get on the airport road, and there are more and more people there. Someone on the divider tries to flag us down, and my friend made a sharp left and took him out, and that guy was literally right in front me on the car all messed up.

There were so many people, and they were all after us. It was fucking crazy. We were in traffic just knocking people off the road. My friend is yelling at me, "You'll be all right". At that point, I was, like, fucked. I said, "Tell my family I'm sorry". I was in no pain. He is yelling at me to stay awake, but I was so up, I remember every detail.

I started getting dizzy, and I thought, "this is it. I am dying in this shithole". We finally got out of there and hauled ass on the airport road. The vehicle died at the gate of an airforce base. My friend gets out and says, "Don't worry. You'll be fine." He runs over to that gate and tells them I'm hurt. He comes back, picks me up because my legs are broken, and throws me on his back. He then carries me to the gate and tells the guys to take me to the hospital.

The whole time I was cursing out the airforce guys who took me to the hospital. One guy was trying to hold my hand. I wanted water, and they wouldn't give it to me. I wanted a cigarette. Those guys got a Bronze Star for driving me two minutes to the airport. My friend got nailed. They said that it was his fault we went out there. He got 45 days extra duty without pay. They said it was our fault. The E-7 who gave us the vehicle said we just took it, which was a lie. I was put in for a Bronze Star, but it was rejected. My leg sucks; it's messed up. They almost had to cut it off.

There was a big hole in my leg, like two inches.

In Baghdad, they told me my hand's gone, but the doctor said he was going to try and save my leg. I lost a lot of blood. I was really mad. I was yelling at everybody. My legs above my knee took a lot of shrapnel. Every time they moved me, my leg hurt so much. My hand never hurt.

They sent me to Walter Reed Hospital. I was there for seven months. I hated it, but the nurses and doctors are amazing. I don't even know how many surgeries I had. It seemed like every week, I was having a couple of surgeries. My throat was real sore because they had to put a tube down my throat each time.

I didn't want to live anymore. I was done. I was 20 years old and all fucked up. I was really depressed; I didn't want to do anything. They told me I needed to be on antidepressants, but I didn't want to take them. I'd get really frustrated. I really wanted to kill myself. I just didn't know how. It was a hard time. I was really unhappy. I would cry. I couldn't sleep at night. I still can't sleep for shit. I feel really antsy all the time. It's weird—at night, I'm paranoid. I sleep with a gun by me. It's with me wherever I go. It's not normal. It just sucks. It's hard, dude. I feel I got caught sleeping one time, and it ain't going to happen again.

The president came twice, and I left. I didn't want to meet him.

I feel he and his whole administration lies and puts our lives in jeopardy. He didn't want to meet me.

I went home in January 2004. I had the whole hero's welcome ceremony at the courthouse, and that was cool and everything. The spotlight was on me.... My girlfriend... was very supportive. If it weren't for her, I wouldn't be here. Still, sometimes, I'm like, "Why am I here?". She is always there to tell me otherwise. So I was really close to her when I got home. I clung to her.

My girlfriend is in college, and she went to study in Spain. I started drinking and taking pills. I would drink all day long, all night. Sometimes I wouldn't sleep, just drink and take pills. I needed to get away from that. I had money saved up and met her in Spain. We went to nine countries, and I stopped the pills.

I was going to school for a while, but it was hard being home and doing normal everyday shit. I feel like such

an outcast. I didn't feel I fit into society, and I get depressed because of it. At school, everyone was staring at me, and people were always asking about my hand. Sometimes, it's too much: I went this semester. I went to all my classes for one day, had a fight with my girlfriend, and then dropped out. I stress out too easily.

I don't wear the electric prosthetic. It's heavy, it makes you sweat, and then it slides off. It's really uncomfortable. I really liked the hook. It was easier to use. I got so mad one day at Walter Reed, I threw the prosthetic against the wall. I hate that stupid thing. I wear the hook when I play pool, but it draws more attention. I'm more comfortable without it.

I had a fake hand, too. I wore that a lot for a while. It was light. If I wore a long-sleeved shirt, you couldn't tell. Then a finger broke off of it, and I had it taped up with safety pins, and it looked really ghetto. To get another, I'd have to deal with the VA (Veterans' Association), and I can't deal with it.

The VA fucked me over. They sent me a letter telling me my claims were denied for my leg and PTSD, my hearing, and a lot of shit. They said nothing was wrong with my leg. I flipped out. I have a bar in my leg. I have a lot of ringing in my ears. Sometimes I can't hear; sometimes it's fine. They tried to say my leg would get better, but it's gotten worse. I don't like crowds. I almost crashed my car because I was seeing things on the road. My other hand hurts because I overuse it. I was wigging out. Not getting my benefits cost me $500 just on bounced checks. Then the *Washington Post* called me, and I told them everything. The article comes out, and the next day, the chief of staff of the VA called me. I told her I couldn't even live. Then the next day I got a check. Two weeks later, I get this check in the mail and a letter that says they're bumping up my rating from 100 percent to 120 per cent disabled. A few weeks later, they bumped it up to 200 percent because of the PTSD.

I go every Wednesday for therapy, but I mostly go to be with the guys. It doesn't help one bit, but afterward, we all hang out and smoke cigarettes outside. That's all I do with the VA.

I had a job for a while when I got back doing fiber optic cable splicing. The guy I worked for even wanted to send me to school. But he was a born-again Christian, and he was trying so hard to convert me, and I couldn't deal with having a job and the responsibility.

I liked being in the army until Iraq. I was a really good soldier. I did everything I was told. Every now and then, I go to the list and see who died. I'll see people's names that I know. It's sad, man.

Originally published in *In Conflict, Iraq Veterans Speak on Duty, Loss, and the Fight to Stay Alive*, by Yvonne Latty, Polipoint Press.

Artist's Diary

J4MED, Op Herrick 7, 03.11.07–26.11.07

DAVID COTTERRELL

In November 2007, artist David Cotterrell travelled to Helmand Province, Afghanistan, as a guest of the Joint Forces Medical Group. For three weeks, he observed the work of military medical staff at the main field hospital at Camp Bastion. His documentation forms part of the research for a new body of work commissioned by the Wellcome Trust for the exhibition *War and Medicine*. The following passages and images are extracted from his personal diary and photographic records.

03/11/07 *Leaving Brize Norton*

05.25: Waiting in departure lounge of RAF Brize Norton. After wake up call at 04.00, breakfast at 4.30, I have successfully checked in for my C17 transporter flight to Kandahar. I am the only passenger.

Dressed in combat trousers, desert boots, body armour and with a 20 kilogram bag as hand-luggage I am relieved to be ready and in the right place.

I should have left yesterday. If all had gone to plan, I would be waking up in Kandahar (KAF) about now, instead of listening to *News24* and contemplating 11 hours in the hull of a giant supply plane. After a night without sleep, packing, rendering and emailing, I had managed to misjudge time. In denial, as always about the impossibility of traversing London, I had arrived just an hour before departure. OK for easyjet but not acceptable for RAF airways. Turned away and Lt. Col. Copanni's masterplan was casually disregarded.[1]

At 6:30, I am called to board the RAFC17. A small woman appears, looking flustered, and suggests I follow her. After a negotiated pause to buy reading material I find myself going through security/passport control. This consists of a pair of double doors leading on to the runway. I demolish the back shelf of the waiting Renault Clio as I dump my camera bag and we drive across the airfield to meet my transport. The crew are already aboard and preparations have obviously been continuing for a while. I am led up the steps of the squat plane and motioned toward one of the canvas jump seats fixed to the side of the fuselage. Earplugs are waiting for me and the baggage that I was fretting about earlier is ratchet-strapped to the floor in front of me.

Half a million rounds of palletised ammunition is cargo netted around me.

04/11/07 *Arrival In Bastion*

I find myself sitting amongst a squad of Royal Marine Commandos. They appear incredibly young. One of them, who looks like a teenager, is wearing a Commando knife in his chest webbing. It is hard to reconcile my recognition of this student-aged man with the eight-inch blade fastened at the ready on his armour. After a strange propeller-powered 45 minutes I wake to realise that we had all been lulled into a fitful sleep by the drone of the engines. I hastily—too late—put my helmet back on, before the LM has time to chastise me. The marines smile with recognition at my amateurish lapse in protocol.[2]

The ramp opens to reveal the orange light of Bastion. The sun is setting and vast amounts of dust have been thrown into the air by the landing. The diffused glow of the sun appears to ignite the sky. In the distance I see a burning plume of smoke (apparently the 24-hour waste fires).

05/11/07 *First Briefing*

My worries about failing to wake up are swiftly averted at seven am when the lights in the tent crackle to life. I am surrounded by activity. I decide to embrace the challenge and swing out of bed to take a long-needed shower. The shower block 'Ablutions', like everything else, is semi-communal. I feel conspicuously unfit and I try to pretend that my ponytail is not noticeable.

9.30 am, I have an invitation to attend the 'ops' briefing at the MED GRP CP and after bombarding the adjutant with questions return with him to sit in on the daily senior briefing.[3] Acronyms describe all units, events and places. I imagine the briefing is confidential, but even if it weren't, I would need a code book to decipher the language of common usage.

"Enhanced threat of VBIED reported by RC FOB Delhi" = Enhanced threat of Vehicle-Bourne Improvised Explosive Device reported by Regional Command, Forward Operating Base, 'Delhi'.

After the meeting finishes I meet Colonel McGroom. He is the Group Commanding Officer (CO) meaning that he is in charge of medical services for the whole of Helmand. A silver-haired, immaculately turned out soldier, he takes time out of controlling operations across the whole province to brief me on the network of services and operations that Camp Bastion is part of.

TM = Team Medic; CMT = Combat Medical Technician; MERT = Medical Emergency Response Team; MERTE = Medical Emergency Response Team Enhanced; A&E = Theatre; ITU = Intensive Treatment Unit; CCAST = Critical Care Air Support Team/AEROMED; BZZ = Camp Bastion; KAF = Kandahar; Selly Oak Hospital—Hedley Court Rehabilitation Centre.

We are interrupted by an officer leaning over to mention, "Sir we have a T2 coming in, ETA 18 minutes." The colonel replies with a quick "Thank you" and continues his briefing.

The meeting ends with a brief handshake before the Adjutant once more appears to escort me.

An insurgent has been captured and MERT have brought him for treatment. It seems that he was a suspected mortar commander and has been shot in the leg. We photograph the helicopter approaching and find ourselves coated in dust as the Chinook "wheels down" (WD).

The ambulance crew is waiting on the Helicopter Landing Site (HLS) (The ambulance looks like a second-world war vehicle from the film *Ice cold in Alex*) and within seconds they have transferred the prisoner and are making the 300-yard journey to A&E at 15 mph (the camp speed limit).

I make my way on foot to the A&E entrance. A crowd of medics has formed. The colonel is already waiting in the background. The crowd is bigger than normal as it includes several Royal Military Police (RMP) officers waiting with side-arms to escort the suspected Taliban fighter. He is blindfolded when he arrives and is searched carefully with metal detectors and before being allowed entrance. I stand back as he is wheeled into A&E. A team of about ten people is waiting. Notes are taken in triplicate as X-rays are taken digitally and he is stripped and prepared for surgery. The wound is not life threatening and within ten minutes he is being wheeled, already sedated, into theatre. The *MASH*-style theatre is an amazing venue. Under canvas like the rest of the hospital the theatrical lighting of the operating spotlights adds to the incongruity of surgeons with blue gowns over Disruptive Pattern Material (DPM) uniforms. We stand well back beyond a striped line on the floor, attempting to understand from a distance what is happening in the bubble of intensity at the far end of the dome tent.

06/11/07 *First Operation*

At ten am a 9-liner starts to come through the "Jchat" system: a T1 casualty (meaning evacuation needed within an hour or less—life threatened). People purposefully begin to manoeuvre themselves. The MERT consultants seem to look a little more like soldiers than doctors. They slope off to their unit, the Command Post (CP) staff return to their desks and the surgeons head out for their cigarettes.

I rush to my tent to assemble a selection of lenses. I feel a little vulgar; my role is sinister, an ambulance chaser with a camera. I am here to consider 'War and Medicine'—the role of healthcare in combat. I have never been in the military and have never seen an operation. I am a trauma tourist desperately trying to justify my role—to others, but more difficultly—to myself. The camera keeps me busy; it gives me a function in the room, but it is not my purpose.

Half the doctors expect me to produce a painting, a significant number would prefer that I wasn't in the way and a few like the idea of me documenting their skills for posterity.

By 11:00 am the helicopter has not returned, I begin to hear little bits of news. The casualty may be in a minefield. It will take at least another hour for the other soldiers and engineers to inch their way toward him. He has self-administered morphine and is conscious. I find it impossible to imagine: two hours with a mine injury awake and unable to move. At 1:00 pm the Chinook finally arrives. As it swings into the HLS the sand washes over the waiting Land Rover ambulances, and medics run from both vehicles to meet and make the exchange. The soldier is wheeled across. I watch from a distance with a telephoto lens. By the time I have walked past the QuarterMaster's (QM's) office to the entrance, the ambulances have arrived. As always, a crowd of some of the NHS's most highly paid and skilled consultants are waiting in DPM clothing.[4] A group involved in 'Resus' and triage are already forward as the stretcher emerges. The others stand back, waiting for indications of their respective tasks.

He is taken to Resus. Awake, in pain and bloody. The doctors adopt varying roles. One doctor stands with a nurse and an administrator at a lectern taking notes of every observation. Others direct the X-ray team, manage the unwrapping of the field dressings, check the vital signs, look for internal bleeding and try to calm the soldier. He is young; I suspect, a commando and from the York's regiment. From overhearing the doctors, I find his name is 'Jono' Lee. He is from Lancashire—Bolton. His right leg has been bandaged in three field dressings—each one can absorb a litre of blood. His foot is unwrapped and clothes are cut away. It strikes me that all the kit fetish that follows the FOB postings is discarded. The boots, the webbing, holsters and DPM are cut into pieces, and the blood-soaked pieces are deposited into a black plastic bag for incineration.

The most obvious injury is to his foot. Bone and flesh hang from its centre. The heel protrudes about two inches below the base of his sole. The X-ray explains. There are no fragments of shrapnel. The force of the blast has travelled through the armoured vehicle into his foot and with devastating effect has forced the bones from the base of the foot upwards. The neat lattice of bone and tendon has been rotated and pushed away from his heel. The anaesthetist is beginning his work. The soldier keeps shouting "Sir!" as he deliriously looks around "Don't take my legs", he appeals. "Have I got my legs?" He doesn't believe the doctor who reassures him that the remains of both are still attached to him.

I am wearing a heavy X-ray apron and find myself welling up. The activity seems further away and I find myself cold and sweating profusely. I struggle to stop myself fainting. I mustn't faint.

His right leg has multiple fractures and the knee is crushed. His left leg is also broken. He is still conscious as they wheel him to theatre. My dizziness eases to the extent that I manage to follow Jono into Theatre 1. Theatre 1 is a tent, like the rest of the hospital, but it is illuminated with dramatic lighting and inside, a new team waits. The surgeons wear gowns over their DPM and plastic covers over their desert boots. Two surgeons and a consultant anaesthetist work over Jono. He is put to sleep, and intense but unhurried activity takes place to untangle the mess of bone and skin. Pieces of bone come off the base of his feet in the surgeon's hands. He cuts away the last bits of muscle and skin symbolically attaching the bone fragments to the soldier and places them in a steel tray.

The foot is emptied of dead tissue and takes on the form of a near empty bag of skin. The toes are still attached and have the appearance of some remaining circulation. I pray that the surgeons will decide that the foot will survive. One of the doctors continues to search for signs of a pulse in his toes. Despite their appearance, the surgeon suspects that they are no longer salvageable. One of the doctors suggests to me that the best case for him will be to lose the lower part of his right leg. I listen quietly but am horrified.

Strips are cut in his calves on the four chambers of his muscle cavity to stop the swelling from cutting off the blood supply. The macabre effect of his flayed legs is heightened by the theatrical lighting.

By 3.30, the operation is nearly complete; the wounds are left open and packed with gauze. No amputation will happen here. They will allow Jono to return to Britain as he is. The decision will be made in Selly Oak. Layers of plaster are applied to his legs and he is transferred to intensive care, ready for evacuation.[5]

Two more injured patients are waiting for theatre.

07/11/07 *Loss Of Momentum*

I feel dislocated and aimless. I am not certain if my anxiety comes from my ethical fears of delivering a facile response or from thwarting of adolescent fantasies. I am not certain of my own intentions.

08/11/07 *Watchkeeper*

Next morning I resolve to miss breakfast. I arrive at the briefing but am distracted. Inkerman is being attacked; SIED in Lashkagar.[6] The abstraction of Bastion is becoming a problem.

I speak to Col McGroom after 'Prayers'. He says he is helpless to make anything happen and asks me to present a slide show the next morning.[7]

I walk past the 'Watch-keeper' and ask if he can explain his role. He has been expecting me. He sits me down and talks through the emergency 'Jchat' system. "Medic" calls out from the software at intervals as if the real cries of pain are synthesised across the region. He agrees to let me film him as he electronically monitors and directs the evacuation of a casualty.

We don't have long to wait. The electronic chatter suddenly becomes more intense. Red lines of text scroll down the screen: two T2 casualties. I leave the cameras rolling and retreat to Simon's office. An hour later the Watch-keeper's patient work is rewarded: WD at Bastion—two Afghan children and their dignified elderly-looking father appear from the ambulances.

I am struck by how beautiful they are. The son has shrapnel to his face and is in pain. The daughter has a wound to her leg and looks like aliens have abducted her. She is wide-eyed and confused. All three are covered in a thick layer of desert dust. I leave them as they are stabilised in Resus, unable to face another operation so soon.

Instead, I head over to the 'Super Kitchen' mess tent for 'scoff'. I meet the force protection lads with their sergeant. I am invited over and get to speak with Lieutenant John Dolphin. We agree to meet up next day. I am quietly proud to be sitting with soldiers without the aid of my medic hosts.

Once again I find the surreal holiday-camp 'Entertainments' sergeant and am invited to try driving a collection of huge military vehicles. I select a 'Warrior' armoured-personnel carrier and heavy ISO container-carrying army lorry.[8]

Unsurprisingly, I find the Warrior quite difficult to control with the driver blind (shutters) down. I direct through intercom, crushing cones and over-steering. The low-loader is more successful. After bouncing, crunching and stalling around the camp, I successfully dock and pick up a trailer, gaining something close to surprised praise from the convoy driver.

Again I feel guilty for the playful interlude and return to the hospital. I somehow feel like I'm working when I'm smoking with surgeons or drinking coffee with the ambulance drivers.

Ron shows me a slideshow on his laptop.[9] I mishear and don't really understand what I'm looking at. It's a series of photos of a young soldier in Kajaki and Sangin.[9] Beautiful landscape and poetic views end with a photo of a flight of steps. "That's where he died", Ron says wistfully. "You knew him?", I mutter. I hope Ron didn't hear me. At least he never acknowledged my ignorant statement. I realise soon after that the young man was his brother-in-law—his sister's husband. He died seven months ago in Afghanistan.

09/11/07 *T4*

At 7:15, I wake up to see the pod nearly empty with Col Goulbourne hurriedly leaving. I check my watch. Something strange is happening.

I go to CP suspecting a problem. 2 T1s and a T4. I assume a T4 is a light injury. I am wrong—T4 means dead. I don't know what to do. My problems of appropriate behaviour are insignificant compared to the enormity of the events taking place. I find myself feeling clumsy and self-conscious. I go to see the Regimental Sergeant-Major (RSM). He is a kind and darkly funny man. He is the right man to ask. He will coordinate the treatment and reception of the fallen soldier. He says he thinks I should be there and to speak to Col Goulbourne. I eventually find myself standing next to the Colonel still not knowing his name. I explain that the RSM has asked me to speak to the Col. Not flinching at my peculiar turn of phrase, he says in answer to my question: "Yes, alright, but no photos please."

Almost out of habit, I nearly protest but pull myself together in time. With cameras and lenses still hanging off me, I am embarrassed to find myself lined up with the padre and others to receive the body.

The two T1s arrive first. Thankfully they're serious but not life-threatening. A broken arm and head injuries. After they have entered the hospital the last ambulance arrives. Wrapped in a clear plastic bag within an open dirty green body bag is the soldier. There's enormous dignity offered to the dead man. The ambulance crew, assisted by two other soldiers, gently lift the stretcher from the ambulance and place it on to the trestle base prepared at the rear entrance to Resus. With the sun beginning to bake, the noise of the generators drifts away.

We bow our heads and the Padre—Padre Barrett, a mild and friendly Methodist preacher—says a short prayer. I feel shaky as I gaze at the unkempt and skinny frame of the soldier. His clothes are soaking wet and hang clumsily from him. He has developed a wispy full beard of inch-long red hair. He has a blue tint to his pale and dirty skin. I suspect he is from Inkerman. This place has delivered so much blood and gore in my short time at the hospital.

He is carried into a room at the back of one of the wards accompanied by the RMP's, the Padre and a few nurses, Col Goulbourne and me. I am the last to pass through the plastic curtain. One of the RMPs looks accusingly at me. He speaks to the Col. "Do you know this man?", he says about me, as if I am out of earshot. Col Goulbourne explains and I am brought in by one of the nurses. The room is small and I stand shrinking a metre from the soldier. JM Alderton (Jake), Lance Corporal Royal Engineers.

I can't help but stare at Alderton. The doctor checks for signs of life. Pulse, light in the pupils. He uses my torch (and I am grateful to have a small purpose) and touches a cloth to the man's cornea. He is formally pronounced dead. The RMP steps forward, with a camera, and begins to purposefully and efficiently photograph the body from several angles. The kindly look on his face belies no acceptance of my presence and I still sense his distaste at having a voyeur in the room.

There are strange pauses—the RMP's batteries die in his flash unit. And the nurses use the time to check that I am OK. I am embarrassed by their concern but relieved. Although I feel wrong, they don't seem to mind me being there.

The RMP finally finishes and the body is prepared for identification. His face has been compressed at the right side. Blood has dried around his eyes and nose. He is lifted off the clear bag with a 'documents attached' plastic label onto a neighbouring table. He is extremely heavy and seven people assist in the move. His body is wet and his face partially blue. It seems that once again he was on "top cover". The NVGs worn work well, but make distance hard to judge. The Warrior had driven off a bridge and landed upside down in a river. Jake Alderton had drowned in 12 inches of water.[10]

A clean body bag is unpacked and he is again lifted from table to table. They struggle to get his feet in the bag and it becomes obvious that he is too tall. Farcically, he is moved twice again to fit him into a larger bag. The sodden plastic remnants of his original packaging are cleared away and we are asked to leave. A captain from Alderton's company (rear-based force) has arrived and is led in by the Padre and RSM to make the official identification. After a few minutes he has been led away and we are invited back in.

With great care his stretcher is lifted onto its trolley and wheeled out into the daylight. A short walk around the back of the hospital, with concerned checks that there are no passers-by to witness the scene, leads to a line of neutral refrigerated ISO containers.

Gleaming stainless-steel slabs are inside in rollers. Four ambulance drivers struggle and strain to slide Jake's body into the steel bunk. The job is complete. The RSM and QM close, lock and seal the container and we walk back to the Hospital Management Cell (HMC) away from 'Rose Cottage'.

On the way, I speak briefly with Padre Barrett. I am beginning to realise that I may never lose the images viewed this morning.

09/11/07 *Major Incident*

At about 4:00 pm the hospital fills. Clerks are rushing to don surgical gowns. Rumours are spreading. Hell at Inkerman (commonly renamed as 'incoming') 2 T1s, 2 T2s + 1 T3. A 'major' incident is declared. eight more wounded may also be on their way. There are only two theatre teams. Triage is going to be vital. Both MERT teams have been scrambled, all staff on standby have been called in. A level of disorganised well-meaning activity is visible in all locations. With ten minutes to go before expected WD at Bastion, order is impressively restored. At Resus all four bays are ready. Staff wait by each bed. The surge ward is prepared for a further four. The QMs and CMTs are waiting at A&E entrance, manning a line of stretchers, and the RSM calls us all to attention to offer a severe but necessary briefing.

An update on status is given, nonessential staff are hurried away. The order of events is given. This is the first Major incident 'Mass Casualty' for the hospital squadron. It is what they have trained for, but there is some uncertainty as to the point at which capacity will be reached.

In Inkerman, the landing zone is still hot. The Apaches have spent 20 minutes attacking fire points before the Chinooks can land.

Eventually we hear the sound of the helicopters and in less than a minute, ambulances begin ferrying patients—one per vehicle. Paramedics are already working on casualties before they enter the A&E.

The Squadron Quartermaster Sergeant (SQMS) and his staff search the soldiers for ammunition and weapons. All are stretchered. Leg and chest wounds. I notice two men's chests displaying the flutter of Ascherman chest seals rhythmically rising as air escapes their collapsed lungs. One of the soldiers is wearing two CAT tourniquets and has had his boots tied together, trapping an improvised splint.

I set up the camera on Hi-definition to watch the unfolding drama. As I migrate around the activity I hope the camera may offer me some perspective.

It rolls and I stand back. The beds in Resus fill. X-rays, clothes cut away. Cleaning away the dirt of battle and consultants comparing notes. MERT medics arrive, covered in dust and in full body armour, to brief the Resus staff. They appear as if parachuted into A&E.

Periodically, the senior medics pause and convene to compare priorities. I am impressed by this restraint. A scene of violent injuries is dealt with in a strange professional way. Any one of the cases would be life-threatening. Here they seem to be received as routine.

As I stare across the bewildered bearded men in the distance, the first priority becomes visible. As the clothes are cut away the bizarre and gory scene is unwrapped. There is a gap in his legs. His thighs appear missing. I feel sick, as I mistakenly fear his groin may have also been destroyed. Bloody rags and gauze are piled around his legs and in the distance I see figures frantically attending to his mangled body. I withdraw to meet the surgeons grabbing one last cigarette before the casualties become their charge.

I follow them in belatedly, feeling a little exhausted from observing so much in one day. Alone, I walk past Theatres 1 and 2. Col Goulbourne is coming out. "Horrible wounds", he says sympathetically. "Go in if you want." I enter through the curtains. The strangely damaged legs are exposed beneath blue surgical paper, the theatre light accentuating the red of his raw wounds.

"Blast injuries", I am advised by a kindly theatre nurse. It feels wrong being here, but the nurse seems to recognise my unease and says quietly, "It is so wonderful what you are doing here—you are always welcome".

I feel humbled by the scene. Surgeons work on Fletcher's leg and other wounds. The others do not appear to be serious, but the legs are a terrible mess. The thighs appear to have been ripped away. It seems impossible that anything can be salvaged, but the surgeons continue working, painstakingly removing infection-causing shrapnel, clothing and dirt.

I am shown the X-rays on the screen; amazingly, the bones of the legs are intact. It seems that this offers the surgeons some hope. They will try to save his legs.

The surgery lasts over an hour and the floor is red with blood. He has lost nearly all his own and is having a total transfusion. It seems that the risk from this can be rejection. If a transfusion has happened before, he may have too many antibodies and fail to accept the new blood.

The surgery continues—the gaps in his legs are now clean and packed with gauze. They will remain open until he arrives in Britain. Fletcher is to remain sedated. I feel overwrought and tearful. Operations on the other casualties continue. I can't see any more and I find myself sitting with the Resus nurses, having a cup of tea and a few moments of well-needed calm.

The next eight casualties are stable at Inkerman and will wait there until the morning. Tonight the toll was one shot at Sangin, four Injured at Inkerman and two left dead at the scene. Not the longest day, but certainly the hardest.[11]

10/11/07 *Captain Brittan*

The next day I am feeling burnt out. I have been here less than a week. Another five casualties have arrived by the time I wake up. Leaving an empty tent again, I drift to the CP to find out what is happening. I am constructing a logic for my presence, which involves attempting to document each stage from arrival to repatriation. It is a tenuous logic but it helps me to justify my presence and provides a structure for my documentation.

I follow this process through and speak with the surgeon, Lazrado. He agrees for me to film an operation. These ops used to be called 'elective'. Relative to the T1s, they are, but by any normal standards they would be emergencies: shrapnel wounds, bullet wounds, broken bones. These planned procedures are operations where the patient will not die if delayed for 24 hours.

Captain Paul Britton is scheduled for later that morning. He was wounded at Inkerman and evacuated at 4.30 that morning with shrapnel embedded in his shoulder and hand. He had been injured at the same time as last night's casualties, but had refused to leave his squad. A fire-support commander, he had been in charge of a small (now depleted) team controlling mortars, air-strikes, artillery and 'javelin' missiles.

Britton has a shaved head and full beard. Lazrado asks him if he minds being filmed. The response causes hilarity amongst the nurses: 'Just make sure he gets my good side.'

I set up the camera and step back. I can't face another operation and leave as the camera observes for me.

10/11/07 *Padre*

I have a few hours and wander to my remote smoking spot. On the way I pass the tent chapel and a Padre jumps out. "I've been looking for you", he says. "I believe you came to see me earlier when I was out." It is true that I had found myself wandering in to the church a few hours earlier. At the time, I had still believed I was on the way to Sangin and in a slightly maudlin moment had heard music and followed it inside. It is a cliché to seek redemption and faith in times of fear or trauma. I was feeling both and had found myself enacting the stereotypical route to religion. It wasn't entirely cynical. I had wanted to speak with Padre Barrett since I first arrived and felt that I had a dual reason.

Professionally, I had wanted to understand how chaplains could reconcile themselves with the brutality of military conflict.

Military padres are not simply co-located NGOs with a benevolent purpose. They wear uniform and serve the military as well as God. They serve as councillors, confidantes, moralists and (as with the medics), to "maintain the fighting capability" of the soldiers.

I imagined men of God standing between armies, not with them, and find the compromise (or shared concern) mystifying.

However my academic art project was looking fragile. I had seen cruelty and pain greater than I had previously imagined and needed to see the Padre as so many soldiers do—as a neutral friend.

Padre Connolly seemed to think that people were concerned about me after the last few days and really had been working for me. I agreed to his surprise offer to have a 'brew' with him in 20 minutes back at the chapel.

11:00 pm: I arrived and the chapel was empty. I unzipped the door and went inside. I prayed for a few moments. It has been a long time and I began to feel self-conscious. I had forgotten how to pray and it felt contrived.

I read through small Christian booklets with extracts from scriptures, which seemed to have been compiled to support the army's ethical codes—honour, loyalty, discipline, courage, etc—and felt my academic interest rising again. Padre Connolly arrived. I was ready to see him but it was a strange greeting. I don't think either of us was certain of who was interviewing whom.

We sat over cups of instant coffee, trying to find some distance to view the events of the last few days. I was struck that he seemed to genuinely think that I should be offered support in the same way that soldiers serving in much more arduous and lengthy periods deserved.

I felt uncomfortable but grateful. I was shaken and did need some perspective on what I had seen. We grilled each other on the parallel ethical

dilemmas we were facing. Padre Connolly had an interesting self-critical but confident approach to his work. He had long-since rehearsed these issues; and it enabled him to honestly and openly voice his awareness of the inherent contradictions he faced. "The Taliban are bad people … I don't like war … I believe that fighting should end … What the soldiers are doing is necessary … They should receive support like any others." The simplicity and sincerity defeats my bloody-minded attempts to voice doubt and I think we both leave satisfied that we have played our roles.

10/11/07 *CCAST*

11.30 pm: Ventilated, paralysed and sleeping, he is packed into a cocoon of wires and tubes, ready for transit. There are four other 'aeromed' patients travelling tonight. I am introduced to them, but my focus is CCAST. Partly because their work is the most challenging, but also because I feel embarrassed by the watching stares of the conscious patients.

As we exit the hospital tent structure with Fletcher, his four 'opos' have already been ferried to the flightline. We leave the bland uniformity of fluorescents and enter the spot-lit drama of the ambulance bay.

The mass of lines and tubes almost conceals the mummified soldier. The bulk of the equipment fights against the confined space of the ambulance. Five medics gingerly slide Fletcher's life-support equipment past the snags and handles of the Land Rover ambulance. I sit in the front and we move off at the regulation 15 miles per hour.

The camp is silent. The only activity is the distant cinematic drama of a Hercules free-spinning its props. I jump out of the van and run at least a hundred metres, dragging cameras and lenses to greet the waiting patients. The Hercules looked magnificent. Resplendent, glowing in its own dust-storm. The ramp lowered, it reveals a dull Meccano-style infrastructure, dark green and dusty, illuminated with green light. Beams and ratchets stretch from floor to ceiling, the only clue as to its medical configuration.

The stretchers are loaded in the half-light and suspended from the beams, at varying heights. They appear as fruit in a canopy. Brightly coloured plastic machinery and LED monitors glow as the ramp closes.

The loadmaster appears irritated by my presence. "You can take photos. Just make sure neither me nor my boys are in shot, OK?" Duly reprimanded, I join the welcoming CCAST team as we strap into the webbing at the sides of the plane.

During take-off and the flight, I am struck by the kindness displayed by the nurses in armour. Even Fletcher is reassured and comforted in his fitful sleep.

We descend in darkness to Kandahar and as the ramp opens we feel the aircraft spinning around. A majestic sight comes into view. The open ramp of a C17 is waiting, framing an illuminated strategic team. The C130 backs up to its larger sibling until 50 yards of tarmac separates the two worlds of tactical and strategic care. As I stand up, the loadmaster lopes over to me in his low-slung boiler suit. "Sorry I was rude before. I thought you were press. No hard feelings."

I nod, "No problem." I politely ask to photograph the transfer, taking advantage of the LM's surprise contrition. I am graciously waved off.

Standing on the runway between these two great transport aircraft, I watch the stretchers being ferried across, illuminated by an honour guard of ambulances and Toyota pick-up trucks.

I feel a strange sense of calm as the patients, strapped into the stretchers and protected by an assortment of Day-glo equipment, are received by the C17 strategic CCAST team. I feel that some of the tension has passed away. They are crossing a threshold on the runway between combat and care. Their guilt about leaving the friends and duty, which appears so present at Bastion, appears to be left in the Hercules. As the stretcher crossed the halfway point between craft, it crossed a threshold. The gravitational pull of home overtakes the longing for the immersive FOB community. Powerless to resist, there is no shame for the soldiers. Their injuries answer any enquiries. The comfort, care and cleanliness of the civilian world beckons. The CCAST envoys welcome their cargo, outnumbering the patients three to one, and envelop them in the warm light of the C17 cathedral.

11/11/07 *Remembrance Day*

I am barely conscious. Heat, sleep-deprivation and dehydration are taking their toll. I leave Simon as he returns to his work and I decide to struggle through a coffee. I still feel a strong motivational guilt and resolve to use the next few hours to try to pursue the hidden health services of the military. Quite unrealistically, I decide that now would be a fine point to interview the community psychiatric nurse.

Behind the elaborate tent structures of the hospital, there is a shabby little tent.

A forlorn structure. You can imagine the indignant Community Psychiatric Nurses (CPNs) begging for an upgrade to the modern 'pods'.

'Taff' the CPN opens the canvas flap and invites me in. "Crap, isn't it?" he begins. "You can take a photo of this. I'd like that. I'm going to rip up that walkway—no bloody privacy." He motions to the well-used walkway beyond his kingdom. The tent contains a canvas chair and campbed garnished with a "Do Not Disturb" sign. We speak for an hour about the TRIM diagnosis system for battlefield trauma and the aftercare.

I wake for dinner disorientated, hoping that nobody has witnessed my laziness. I head over to the CP and tinker with my photos on the laptop. Col Goulbourne is waiting and makes me promise to have a viewing that evening. Duty-bound I return at 9:00 and have a strange time, with the Colonel kindly confiding in me. He shows me images of his family and talks lovingly about his children. I feel his homesickness behind the cheery exterior. Colonel Goulbourne is always well-presented in his ironed DPM and it is nice to see the man as well as the role. I manage to ring home. Jordan seems tense and I struggle. I would love reassurance and warmth, but I sense her anxiety. She is worried about money. Struggling with the pressure of work and single parenting. I want her to feel supportive of me and to prop me up, indulging my angst with sympathy, but instead I realise how immersed I have become. Elijah is grumpy and angry that I am away. Kezia, as always, wants to tell me everything she can think of. I feel guilty. I am too far from home and too early in my trip to be able to offer reassurance, but I recognise my selfishness and it helps me to pull away from the self-righteous position that I have allowed myself to adopt. Unsatisfied but less self-obsessed, I finally take a full night's sleep.

13/11/07 *QIPS*

The briefing prayers are followed by a strangled slow meander to pack and prepare by the 12:00 pm deadline. Inevitably, I am running by 11.55. Not late, but tight, I meet a young private wearing a Red Cross. "I am your taxi, sir. Heli-flight line?"

We watch two Blackhawks disappear into the horizon before we are mercifully beckoned forward to board one of the two waiting Chinooks. Heads bowed, we march to the open ramps. The engine exhaust scalds our faces and dust rasps as we stand waiting for the LM's permission. I had assumed that soldiers bowed their heads to avoid the rotors. Now I believe it is to save their faces from the debris.

An angry loadmaster shouts at us to get on. A level of chaos is achieved as people fumble under pressure to strap in before being shouted at to move again. There is a trap-door hole in the floor, which I assume will be closed shortly. For now, it causes real problems. The Chinook neatly holds 24 soldiers, but add Bergens, rifles, post, medical equipment, and space becomes limited.[12] Bergens are thrown forwards. One drops through the trap door, followed by the LM. The squaddies around him grab his harness and drag him back aboard. His humour is not improved, and when I motion with the camera for permission, he simply raises his hand and looks away.

When we take off, the hatch is still open and we use our feet to brace bags and objects from falling 1,000 feet. As we rotate to leave Bastion, we stay low, coating runners and vehicles with our downdraft. As we hover between ISOs, I see a bar appear through the hole and with a loud click an underslung load is attached. I see an arm pull away and we are airborne, dragging several tonnes of cargo in a net beneath us.

We fly across tracts of desert scarred by paths and occasional compounds. Distance is entirely abstract. The FOBs and Patrol Bases (PBs) are separated by hostile landscape covered by armoured patrols, Mines, suicide bombers, Improvised Explosive Devices (IEDs) and Taliban. Inkerman is only six kilometres from Sangin, but the journey is only undertaken in absolute emergencies and even with preparation and heavily armed convoys can take over 90 minutes. Lashkagar, as with the FOBs, is an island of British security within the sea of unknown threats. On the Helmand map it looks like a long way but I never see a scale in miles. Distances are measured in 'helo' flight times. 20 minutes is 'Lash' and I enjoy every second. My first helicopter journey—I search for detail in the alien landscape to be rewarded by occasional green fields, where irrigation has revitalised the dormant desert. We arrive at Lash, landing hard and surrounded by dust. "Go!" motions the LM—"Leave your bags." We dutifully run out and stagger around in the draught of the rotors. I can make out bags being thrown out and run back to grab my Bergen. Just in time, my attempts to struggle back to the helicopter bear fruit. As I grab my bag and run off the Chinook for a second time, the ramp closes and it is airborne—off to a further unknown destination.

I am here to see overlap territory: Civil-Military Co-operation (CIMIC)—a strange and hidden facet of the war. We have come to Lash to deliver 10,000 pounds sterling of medical equipment, which we have brought with us on the helicopter as a gift to the Director of Health and to witness the process of Quick Impact Projects (QIPs). These are Helmand Executive Group (HEG) sanctioned proposals for "early wins" (ie projects that may have immediate impact when complete).

The agenda is military—to gain "consent"; social good as a method to support military success.

14/11/07 *Ramp Ceremony*

We are due to leave at 1:00 pm. I have my head-mounted camera ready and at last feel I may get a chance to use some of the specialist equipment I have been dragging through theatre.

But first we have an appointment. Lance-Corporal Jake Alderton is due to be repatriated today. The journey begins from Camp Bastion with a 'Ramp Ceremony'. I have never witnessed this, but I am told that it is a very moving tribute. Over a thousand soldiers and support staff pay tribute to the body as it begins its journey back to Britain by Hercules transport. Although the journey doesn't pass through Lashkagar, a parallel ceremony is held here. Nikki (my CIMIC host) has rushed to get permission for me to photograph the ceremony. I am grateful and with cameras hanging from my neck, we rush to join the ranks of over a hundred soldiers waiting in near silence. Nikki hurriedly directs me to a vantage point to one side of the parade. I hold the camera to my face and the shutter clicks. I drop the camera to my waist, ashamed. Stares from the civilian FCO workers are directed at me. I must look just the same as the reporters that I saw insensitively running around the Remembrance Day parade. I want to explain that Jake Alderton is real to me. I saw him arriving dead in Bastion. I will never forget his face. I do understand the significance of this ceremony, but I sense it is too late to contradict the symbolism of my behaviour and equipment. I feel dirty, like press at a funeral.

I don't attempt any further photographs and join the rear of the parade in silence. There is an unsatisfying sermon. I think I want a profound explanation for the death, but instead there is a brief reading. This isn't the place for answers.

14/11/07 *FCO*

A man with a dark beard and civilian dress introduces himself to me at the Naafi. I had overheard him speaking about politicians with a colleague and have managed to raise the courage to look up from my coffee and acknowledge the discussion. He recognises my name and explains that he was expecting to bump into me. He is George from the Foreign and Commonwealth Office. I remember now that Jemima Montagu from Kabul had emailed me and suggested I might get in touch with him—"a bit Bond", I think she had said.

George is supremely confident and at ease with himself. We meet a little later near his office. Near is as close as I got. He emerged from behind a keycode protected door and we talked candidly but away from his office. I never quite found out what George did, but it was fascinating to talk with him. I suppose at this stage, I was looking for something simple to understand. I basically wanted to know if there was any rational plan behind what I had seen. George explained the systems of governance that should exist and the few that do, and skilfully, without ever fully condemning or endorsing the role of the British, we managed to discuss progress and infrastructure. It is interesting that Ron joins half way through this improvised interview. I introduce George to Ron and Ron to George, but I am conscious that the conversation remains only directed at me. Ron sits, interested but quiet, as George explains the limitations of the military in effecting lasting change. The discussion finishes after George's fourth cigarette as he jumps up and declares that he must return to his work—still without really explaining what his work might be.

As he leaves, I recognise the intensity of the engagement. I had probably heard more about the politics, history and problems of Helmand in that 30 minutes than in the preceding ten days. Ron explains George's lack of interest in him. "He thought I was your minder", he explained.

16/11/07 *KBR*

A Hercules is taxiing ready for take off, the hypnotic drone washes over the base. I decide that a few more vehicular photographs for my collection will justify a pause and set down on a rampart with a long lens. It is not long before a KBR pickup truck begins to approach from the horizon. It is coming for me. I decide to wait. It stops in front of me. A large American in dark glasses steps out and begins to ask me to explain myself. He is suspicious, but satisfied. "We know who you are", he assures me—"You're not hard to spot".

16/11/07 *Film Night*

After dinner, I am invited by the Padre to his weekly film show. This week, playing in the chapel, it is *Casino Royale*. There is a tangible feeling of excitement amongst the audience. I am one of half a dozen male visitors sitting at the back, but the chapel is full. The audience giggles and coos at Daniel Craig. For an hour and a half he is the escapist heart-throb to the women soldiers. The Padre smiles with bemused embarrassment.

Alone that evening, I make a plan. I must document the rest of the hospital. I spend several hours once again trying to ring home. And once again my phone-card fails. I walk through the darkness to the J1 cell and try to find a way to make a call while Op Minimise is not in force.[13] Without resolution, at 2:00 am I give up and email a short message home promising to ring soon.

18/11/07 *Sangin*[14]

We arrive at the dormant Chinook and 20 soldiers plus over 50 mailbags are crammed aboard. It is obvious that mail has not been a priority over the past few weeks. The rotors remain silent and we sit in the calm darkness of the helicopter as the door-gunner Anna puts on extra layers of body-armour. We are all still expecting to miss the flight window. Finally the LM, Anna and the pilots appear ready and a painful whine signals the first attempt to start the engines. The unfamiliar sound stops abruptly and we assume that the crew were simply testing equipment, until we see the LM putting out fires in the ceiling of the rear of the helicopter, tracing burning fuel-lines.

There is a silence for a few minutes. Wearing armour and helmets, wedged against our webbing seats by mailbags, it is hard to turn to see what is happening and a quiet sense of passive ignorance is achieved. It is only when the door-gunner shouts over us to the LM, "You're not really going to try again after putting a fire out, are you?" that we realise what is happening. "Don't worry", comes the response. "Just low pressure in the fuel pumps." We see the LM hand-pumping the fuel-lines to manually increase pressure. A second attempt is made—this time a flash comes from the rear of the cabin and the passengers recoil. The crew starts calling to see if there is an engineer on the craft and our hopes seem to be dying with the failing Chinook. After a painful period over-hearing the LM getting advice over the radio and glimpses of ground-crew engineers across the piles of mail-bags, a last attempt to fire the engines is made. Unbelievably, the Chinook comes to life, deafening and angry. It is now dark and after an eternity on the ground, the crew, with NVGs fixed, carry us airborne into the night sky.

I attempt to appear calm, but am ecstatic. We are on our way. After about half an hour of a very bumpy and cold flight, I smell cordite. I am convinced that the door-gunner is firing. The helicopter lurches around the sky. After a bizarre series of manoeuvres, we appear to dive to earth and land heavily. Sangin, we assume!

The door-gunner raises her hand and shouts to stay still. In pitch-blackness, we don't know if we have arrived, have been hit or are waiting for a safe landing zone. Major Russell, suspects "Keenan". We are airborne again after 15 minutes of cold, noisy ignorance and once more flying erratically through the night. Within 30 minutes another dramatic landing awaits. We are at the FOB. Dust spills in, baggage is passed forward and we are aggressively ushered out. On the ground, a pile of Bergens and parcels has been constructed. We are thrown on to it. "Stay Down!" , shouts a soldier. We grip the bags and each other to stop the rasping wind of the Chinook from scattering people or equipment. We have arrived in Sangin. The Helo disappears into the dust-filled night-sky. In the scrum, my finger is skinned by a boot and I find that one of the bags that I have been pressing into the dirt is actually an Afghan Nantional Army (ANA) soldier. Medical supplies cascade from crushed boxes and we are still not allowed to move. "Second Helo coming in. Torches Off!", shouts a voice. "IR Beacon set up."

The roar of an incoming Chinook approaches. Its silhouette is bearing down over us. It appears to be about to land on top of us, but instead we are simply choked by its down-draught and once more blinded by dust. After no more than a few minutes, it has disappeared and I get up, stumbling around in the darkness with a red-light trying to find my Bergen. I retrieve it and find I am alone. My eyes are filthy, but beginning to adjust to the night. I search the landscape and see the outline of a figure at the top of a dirt track. "You lost? This way mate", he calls. He leads me into the base, past razor wire and bales, before jumping on a quad bike to retrieve the piles of supplies scattered around the landing site. I can barely contain my excitement.

The base is lit by the roving torches of its inhabitants and appears to be a grand, semi-destroyed house of some sort. Through a mud wall with poorly fitting wooden door, I enter a courtyard and see soldiers drinking tea and queuing with plastic plates outside what I assume is the cookhouse. Steps lead up to a stone verandah, where various men seem to be surveying the new arrivals. I climb the steps and am greeted by a man smoking a pipe. "Padre Hallam", the figure introduces, "Would you like a wet?"[15] I have no idea who I am talking to as all the men around me seem to be wearing head-torches, illuminating my baffled expressions, but rendering me blind to my surroundings. I gratefully accept the tea and begin to try to understand my surroundings. "You need somewhere to sleep?" I nod and am shown an empty camp-bed in a sandbagged room covered in Pashto and English graffiti. Six other beds are arranged in the room. "You're welcome here", I'm told, as I, gratefully lower my rucksack.

POSTSCRIPT

These diary extracts document a short, emotional journey through an unfamiliar context: from the RAF base, Brize Norton, to the Forward Operating Base, Sangin, from novelty to institutionalisation. They contrast my angst and self-conscious embarrassment with the absolute confidence of those I was observing—individuals who had little time to prevaricate or to hesitate. Within military culture, each person has a clearly defined rationale and function. The living environment is embedded within the work environment. Uniform is worn at all times and being off-duty means being on standby.

The scribbled diary reveals the intense fatigue that I experienced during a short period of time as an observer. Days rolled together and the inexorable arrival of patients at Camp Bastion's field hospital caused a sense of disorientation. I witnessed neither the instantaneous violence that caused their injuries nor their long-term recovery, which may take years to complete. My desire to head 'forward' to Sangin was an attempt to contextualise the trauma I had seen treated. It became enormously important to me to seek a privilege that many of the medical practitioners were denied: to meet with the Commandos and to understand where they were being brought from and seemed to wish to return to.

Field hospitals are islands between contrasting environments: between the danger and dirt of the Forward Operating Bases and the order and convention of civilian healthcare. In the tented hospital of Bastion, dramatic episodes in individual narratives were being repeatedly enacted. Thanks to the initial lifesaving treatment at the point of wounding, the speed of extraction and the extraordinary skills of the doctors and nurses, most of the injured survived.

For many, their experience at Bastion is only vaguely remembered. Soldiers are dragged from unresolved firefights by helicopter, have morphine administered in advance of arrival, and may leave theatre still sedated via night flights to waiting families and civilian healthcare. For those involved, the process of rationalisation and acceptance often begins in Britain.

I left the field hospital regiment at the end of November. Most of the medics would not return home until spring of 2008. The soldiers and civilians that they had treated would have long since passed through the evacuation chain and dispersed to local healthcare, their regiments or to begin lives as civilians.

During my month-long stay in Helmand, two British soldiers died, 29 were wounded in action and there were 74 admissions to the field hospital. 71 Aeromed evacuations were recorded and an undisclosed number of civilian, insurgent and Afghan National Army soldiers were treated. I arrived back in Britain feeling a great sense of anger. I was frustrated by my previous ignorance of the frequency of injury. Soldiers are surviving wounds that would often have been fatal in previous conflicts. Body-armour, medical training and proximity of advanced surgery to the front-line have led to a "disproportionate" number of casualties surviving. In the media, we hear about the deaths, with only occasional reference to the wounded. I came home assuming the violence I had witnessed in Afghanistan would be the focus of the news. But Reality TV, local politics and other less dramatic events occupied the headlines. For me, the incongruity between what I had seen and what was presented as the public face of conflict was, and continues to be, profound and irreconcilable.

David Cotterrell, August 2008

DR MANTADOR TAHER

OPEN THE HOSPITAL DOORS!

Mantador Taher was just finishing his medical training in Baghdad, Iraq, when war broke out in 2003. As a newly qualified doctor, he bravely volunteered to work at Kerkh General Hospital under the most difficult and violent conditions. He is now Medical Doctor at the Ministry of Health in Baghdad.

A few days before the war in Iraq began, in April 2003, the medical school in which I was a student decided to give us an obligatory vacation; they told us to go back home and to stay there until the end of the war. I said goodbye to my friends, not knowing if I would ever see them again.

About a week later, when the war had started, I volunteered as a senior medical student to work in one of the biggest general hospitals in Baghdad. I never imagined that so many doctors would have decided to stay in the hospitals. Almost every one was packed with health-care professionals and I couldn't get a room in the hospital in which to sleep, so I worked during the daytime and returned back home at night.

In the beginning, there were very few civilian casualties; most of the wounded were military. This situation persisted until 9 April 2003, when the Multi-National Force entered Baghdad and took control of the city, and the Iraqi soldiers exchanged their uniforms for civilian clothes to avoid recognition. The sun of freedom rose again in Iraq for the first time in 35 years.

Everybody was happy (or so I thought) and I began to think about the new Iraq in a very optimistic way. We students returned to the medical school and graduated in August 2003. Everybody was excited about being doctors in the new free Iraq.

The first hospital to which I was assigned was Kerkh General Hospital in Baghdad. The day before, there had been a large explosion in front of Alzoora Zoo, caused by a suicide-bomb attack. All the new doctors assigned to the hospital were asked to help the wounded. So my first day as a doctor was a nightmare, as were all those that followed. For most of each day, there was no power, and because the emergency rooms were flooded with endless wounded patients, all the interns had to be on 24-hour call for emergencies.

A couple of weeks later, there was another bombing in Baghdad. At first, after the explosion, it was very quiet, and then the sirens became progressively louder and people were screaming and shouting, 'Open the hospital doors!' About 200 wounded and dead people arrived at the hospital all at once. We had one emergency room, whose door fell off, and there were only about 15 to 20 doctors in the hospital at that time. A horrible picture still sticks in my mind of people who were completely burned, people with no arms, people with their legs only attached to their body by a small piece of skin. I was shocked. The power went off, we were running out of medicine and fluids, the oxygen cylinders were empty, and it was extremely chaotic. By the end of that day it was quiet again, but we had only been able to save a few people; most of them died because of the lack of fluids and resources to perform emergency operations.

When I sat down, I noticed that my white coat was soaked with blood. I remembered a girl of seven years old who had suffered a hundred per cent burns and had been admitted to the Burn Ward. I was staring down at my coat and my female colleague told me that the girl had just died. I looked up at her and asked, "Why? Why has all this happened?", and I cried. So did she, and that doctor is now my wife

Things became worse when the relentless violence spread over Baghdad and to other cities. The state of lawlessness extended to the hospital wards. Doctors, who were easy targets, were threatened, kidnapped or killed by desperate patients and their relatives, and the vast majority left their jobs and eventually left the country. I heard about doctors killed by the militia and al Qaeda inside their clinics and hospitals, and even in their homes in front of their families. I myself was threatened by patients' relatives and even the patients themselves. With a gun to my head, I gave 15 defibrillator shocks to a dead person because his son was convinced that this would bring him back to life. On another occasion, angry relatives tried to kill me with AK weapons because their family member, who had suffered a severe asthmatic attack, had died due to lack of oxygen and medication for his illness.

The exodus of senior doctors put us junior doctors, fresh out of medical school, in a situation where we had to perform complicated surgical operations that would ordinarily be undertaken by more experienced doctors. The workload increased for the doctors who remained, and we were only able to listen to patients for a few minutes and then write out a prescription. The shortage of power and medicine forced the hospital in which I worked to close its operating theatre. But the emergencies were nonstop. It was a totally ridiculous situation. My six years in

medical school had not taught me how to work in a hospital with no electricity, no medication, no oxygen and with a gun pointed to my head.

Additionally, because the hospital in which I worked was located in a Shiite area, all my Sunni friends left it to work in a Sunni area, and because my wife is Sunni and I am Shiite, we were forced to work in different hospitals to avoid being killed. However, even as a Shiite, I found it necessary to make a faked ID with a Sunni name because I had to pass through Sunni areas on the way to the hospital.

Recently, the situation has improved a little. The Iraq Ministry of the Interior has responded to our demands by simplifying and expediting gun-licensing procedures for doctors, allowing us to obtain licensed weapons much faster than others. I went early one morning with my father's 9mm pistol to get a licence and I never imagined that I'd find so many doctors wanting the same thing. While I was waiting in line, I kept asking myself, "Will I ever use this gun, even if someone tries to kill me?", and I realised that I couldn't do it because I value human life—even that of bad people.

The Multi-National Forces are also playing a vital role in improving the health system in Iraq by increasing security and giving all kinds of support to doctors and health professionals. I have met and worked with them, and I believe they are here to help us. Doctors have been sent for training in the United States, the United Kingdom and other countries. Medicines and medical supplies have been continuously sent to hospitals all over Iraq.

The American Embassy in Baghdad, and specifically the Health Attaché Office, are also crucial, creating a link between the United States Government and the Iraq Ministry of Health. They have undertaken many large-scale health projects, one of which is to build 142 Primary Healthcare Centres all over Iraq, as well as helping to build new hospitals, or to renovate and maintain most of the existing ones. Words will never be enough to thank those people, who put their lives in great danger just to assist us. I remember once asking the Health Attaché, "Why don't you put signs up at the Primary Healthcare Centres that you've built so that the Iraqi people will be aware of your great achievements here?" She replied, "We don't have to. Just to see that the clinics are open and providing health services to the Iraqi people is the great reward."

The pattern of violence in Iraq could be described as a curve. Beginning in 2003, it reached its peak in 2006 and the first half of 2007. In late 2007 and 2008, specifically after the American Army surge, there has been a dramatic drop in violence and better security. Doctors are coming back to the hospitals. This has improved health services, and I hope it will continue to do so.

ADVANCES IN MODERN COMBAT CASUALTY CARE WITH A VISION TO THE FUTURE

William Wiesmann, Nicole Draghic, John A Parrish

SAVe: Simplified Automated Ventilator. Courtesy AutoMedx Inc Germantown MD

"War is the father of all things." Heraclitus (535–475 BC)

BACKGROUND

From the earliest recorded histories of warfare to the present day, the needs of the battlefield and the lessons learned from it have in many ways contributed to improvements in health care. Medical advances are well chronicled in historical accounts and literature. In fact, it was his plague research conducted during the Peloponnesian War that helped establish Hippocrates as the 'father of medicine'.

While these lessons have inevitably led to advances in health care that arguably might have occurred regardless, they have indisputably developed at a far faster pace under the pressure of war. Ironically, in the experience of the American military, the combat mortality rates from the Civil War through conflicts as recent as the Vietnam War have remained relatively constant, in the 20 per cent range, despite improvements and advancements such as hospital facilities in theatre, progress in resuscitation methods and the treatment of shock, the advent of blood transfusions, antibiotics, more effective surgical procedures, and preventative health methods including improved nutrition. The one exception has been the remarkable reduction in death in military combatants due to infectious illness and disease, primarily through the introduction of the prophylactic use of antibiotics, and improved hygiene and sanitary conditions, resulting in significant reductions in non-combat disease-related deaths. The accelerated pace of weapons development has often exceeded or equalled the challenge of delivering lifesaving health care on the battlefield. Each war has its own signature wound, and subsequently, diagnostic tools and treatment methods may need to be modified and/or developed to improve clinical outcomes associated with these injury patterns.

The success of modern medicine has, for the first time in recorded military medical history, shown dramatic reductions in battlefield mortality, yet this reduction is associated with a long-term impact on quality of life; today's soldiers are returning with catastrophic brain injuries, physical

AMERICAN CASUALTY RATIOS INFLUENCED BY MEDICAL PROGRESS

CONFLICT	BATTLE DEATHS	WOUNDS NOT MORTAL	% INJURIES RESULTING IN DEATH
AMERICAN REVOLUTION 1775–1783	4,435	6,188	41%
WAR OF 1812 1812–1815	2,260	4,505	33%
MEXICAN-AMERICAN WAR 1846–1848	13,283	4,152	76%
CIVIL WAR (UNION ONLY) 1861–1865	364,511	281,881	56%
SPANISH-AMERICAN WAR 1898–1899	6,400	1,662	79%
WORLD WAR I 1917–1918	116,516	204,002	36%
WORLD WAR II 1941–1945	405,399	671,846	37%
KOREAN WAR 1950–1953	36,516	103,284	26%
VIETNAM WAR 1964–1973	58,198	153,303	27%
GULF WAR 1990–1991	299	467	39%
OEF OPERATION ENDURING FREEDOM (BEGAN 2001)	542	2,205	19%
OIF OPERATION IRAQI FREEDOM (BEGAN 2003)	4,122	30,409	11%

HemCon Bandage in use. Photograph by LTC John McManus, MD. Courtesy HemCom Medical Technologies Inc, Portland, OR.

mutilations from limb and burn injuries, emotional disorders and heightened risk of infection. The lessons from this conflict and impact on military and civilian health care are yet to be fully realised, yet will undoubtedly help shape future medical research.

While it is not the purpose of this chapter to chronicle all of the medical advances that have occurred in the history of warfare, it is instructive to consider some well-documented examples from more recent American conflicts to understand the evolution of warfare medicine, its impact on modern medical care on the battlefield, and how these developments could lead to global health-care advances in the twenty-first century.

A careful analysis of combat casualty data following the Vietnam experience highlighted a number of important deficiencies in battlefield healthcare and has essentially led to a revolution in the way the American military approaches the care of injured soldiers; the Wound Data and Munitions Effectiveness Team (WEDMET) database has helped to direct military medical research, logistics and medical tactics since Vietnam. This data supports the notion that because the majority of casualties occur on the battlefield in the pre-hospital environment, strategies that focus on in-hospital or in-theatre hospital care are less likely to result in significant reductions of mortality following combat injury.

The introduction of better methods of controlling haemorrhage through hemostatic bandages and superior tourniquets on the battlefield, as well as the far-forward placement of surgeons and the rapid evacuation chain, has significantly improved outcomes following combat injury in Iraq and Afghanistan. These advances in battlefield medicine have resulted in the lowest fatality rate in modern warfare.

However, there is still considerable room for progress. Unlike in previous conflicts, the severe injuries that are now survivable on the battlefield have serious consequences, including long-term disabilities, for surviving soldiers. These are challenging but realistic facts that must be a priority in battlefield medicine research.

Current research suggests that the battlefield medical care of the future will evolve rapidly to greater and more

comprehensive capabilities to quickly diagnose the nature and severity of the battle injury and accurately direct life-saving therapies sooner and more effectively than has ever been considered possible. The American military has implemented a longstanding R&D investment in military medicine, including infectious disease research, preventative vaccine development, psychological research, protective gear and diagnostic and point-of-care devices.

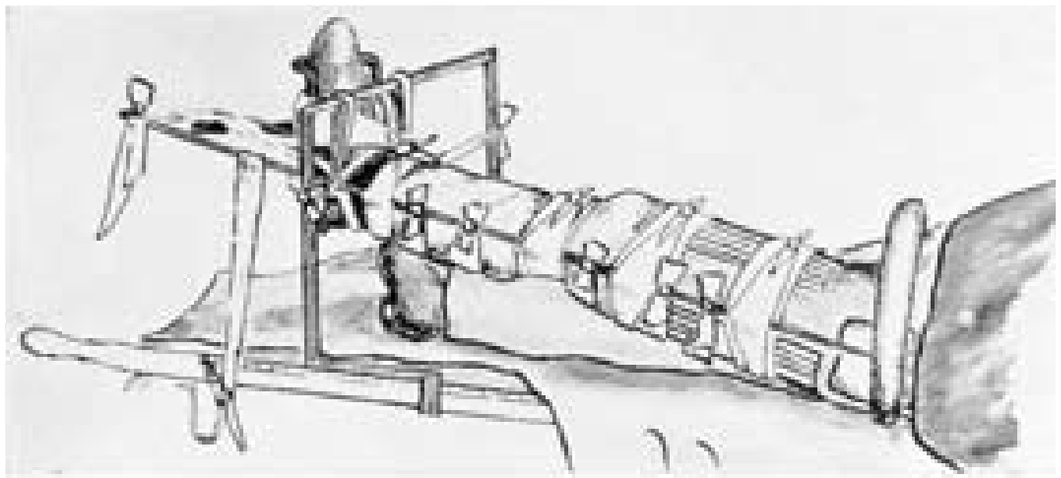
Because of its exigent circumstances and greater and timelier need than those of the civilian experience, military medical requirements drive the development of research and the advancement of adaptive, practical medical devices to support military missions in austere, far-forward environments. Often, these advances will ultimately have direct application to civilian healthcare, particularly in civilian trauma cases. In fact, the military is often the first to use new healthcare technology; between three and five per cent of mainstream medicine is derived directly or indirectly from warfare. Beginning with the American Revolution, each military conflict has resulted in advancements and improvements in medical care.

HOW HAS MILITARY MEDICINE IMPROVED HEATH CARE?

The American Revolution witnessed the first command-ordered immunisation programme when George Washington ordered inoculation for smallpox. In response to problems in removing the overwhelming number of wounded from the battlefield, the first ambulance corps was created during the Civil War. A three-tiered evacuation system was developed, with 1) a field dressing (Aid) Station located next to the battlefield, 2) a field hospital located close to the battlefield, which utilised local barns or houses for emergency surgery and treatment, and 3) a large hospital located away from the battlefield for prolonged treatment.

During the Spanish American War, research was developed to fight malaria, making the building of the Panama Canal possible.

The First World War introduced the Thomas splint, which reduced mortality due to compound fractures from 80 per cent in 1916 to eight per cent in 1918. The military tactic of trench warfare produced large number of facial wounds.



The application of the Thomas splint. From Mitchener & Cowell, *Medical organisation and surgical practice in air raids*, 1939. Wellcome Library, London.

In response, the American established hospitals for maxillofacial surgery, which established the team approach to reconstructive surgery. Chemical warfare resulted in mask development and treatment of chemical wounds. Chemotherapy grew out of studies researching the toxic effects of mustard gas. During the First World War, the idea of triage as a medical procedure was implemented, and automobile ambulances were utilised for quicker patient transport.

The Spanish Civil War provided a testing ground for new weapons and tactics. It was the first time sulpha drugs were administered in surgery. The widespread use of antibiotics and antiseptics resulted in a dramatic decrease in infection rates. Only 342 of 42,000 soldiers underwent amputations despite still primitive surgical conditions. The first large-scale employment of mobile surgical teams and blood transfusions using stored blood also occurred during the Spanish Civil War.

The Second World War provided a great clinical laboratory; the common use of blood transfusions, DDT, aeromedical evacuation, anti-malarial drugs and the management of burns were tested and evaluated during this conflict. Due to the increased need for treating wound infections, resources were dedicated to investigating and purifying penicillin, resulting in its mass production and wide use. The first mobile field surgical detachments were established during this conflict.

Korean War innovations included the first use of a helicopter in medical evacuation and MASH (Mobile Army Surgical Hospital) units that provided high-level surgical care as close to the battlefield as possible. Battle surgeons began to treat vascular injuries on a routine basis, which prevented traditional military amputation. Although not specifically developed for military medical use, during the Korean War Kolff-Brigham dialysis machines were instrumental in the treatment of injured American soldiers. Deaths due to renal insufficiency decreased by 50 per cent.

In Vietnam, the counterinsurgency warfare forced rethinking of casualty evacuation; the helicopter provided the greatest flexibility in patient transport. Although the Korean War utilised helicopters in medical evacuation, their size precluded carrying more than two patients in external pods attached

Medics from Second Brigade Combat Team participate in a pre-deployment medical evacuation exercise at the Yakima Training Center, Washington, 2006.
Photograph by Sarah Underhill. Courtesy of US Army

to landing skids; in Vietnam, 'Hueys' transported six to nine patients. Vascular surgeries became routine, and the use of whole blood as a resuscitation solution was a factor in reducing death due to shock.

The War in Iraq's medical contribution is two-fold: medicine has focused on prevention and wellness as well as improved care. To reduce the time between the occurrence and treatment of battlefield casualties, improved medical evacuation vehicles, modularised combat support hospitals and forward surgical teams have been utilised. The forward surgical teams are designed to enable damage-control surgery near the front lines, and are capable of treating major chest and abdominal wounds, continuing haemorrhage, severe shock, respiratory distress, amputations, major organ fractures, crush injuries and closed head wounds.

Improvements in body armour and haemorrhage-control techniques have also resulted in a higher survivability than previous conflicts. Increased pre-deployment screening and preventative medicine have resulted in a reduced disease rate in deployed soldiers.

Undoubtedly, lessons learned in these conflicts have brought about improvements in civilian care, especially transport and triage. However, civilian trauma management usually involves emergency medical care provided at a single facility. Due to the more remote and fluid location of the battlefield, trauma management must be adapted to treat the wounded soldier.

MEDICAL CHALLENGES

The Iraq War has allocated the most organised and sophisticated trauma care in history. This, coupled with improved body armour, has yielded unprecedented survival rates (nine out of every ten soldiers wounded survive, compared to 7.5 of ten in Vietnam). Yet these advances come at a price; no other war has created so many seriously disabled veterans. The rate of amputation, TBI (traumatic brain injury), and PTSD (post-traumatic stress disorder) is higher than in any previous conflict.

Each war has presented its own medical challenge. This war has clearly identified and mandated concrete progress not only in preventative and protective technologies, but also in the full medical spectrum, fostering research in prosthetics, focused and improved rehabilitation, as well as the recognition and requirements of mental-health issues.

FUTURE

THE PROMISE OF REGENARATIVE MEDICINE

Investigations into the regenerative properties of stem-cell therapies and adjuncts to stem-cell therapies including growth factors and cellular mediators that can restore lost organ function, reduce the inflammatory scarring, and regenerate tissues that have previously been lost show promising preliminary results. In America, the Wake Forest Institute for Regenerative Medicine has successfully engineered bladders, urethras, heart patches and blood vessels. The Tissue Engineering Advanced Technology Team (ATT) at the Center for Integration of Medicine and Innovative Technology (CIMIT), Boston, is investigating the development of a tissue-engineered liver replacement and the use of heart-cell injection to restore muscle in patients with congestive heart failure. The National Regenerative Medicine Foundation

HemCon Bandage. Courtesy HemCon Medical Technologies Inc, Portland OR.

is heading research supported by the DOD to grow limbs for injured soldiers. The complex genetic responses in conjunction with the latent activation of endogenous stem cells and growth factors, which permit the salamander to regenerate a lost limb, has given hope that these silent regenerative mechanisms can be activated in humans. A great deal of important investigative work has yet to be completed that will have direct application to the improved survival of battlefield casualties, including restoration of lost bone, tissue, muscle and even brain tissue. But the high prevalence of extremity injuries, and direct damage to the spinal cord following explosive injuries have stimulated renewed interest in novel ways to improve peripheral nerve and spinal-cord damage. One method is the more intelligent use of resuscitation strategies to reduce collateral damage to oxygen-starved tissues and mitigate inflammatory responses administered in the early minutes following injury. Another is the investigation of the application of 'growth factors', which stimulate nerve, muscle, skin and immune function and regeneration, as well as 'cytokines', regulatory proteins derived from immune cells, which are promising to accelerate the restoration of lost tissue following injury.

SHOCK AND SURVIVAL

The use of modern, aggressive and intelligent fluid resuscitation in cases of shock, including low-volume resuscitation in order to maintain adequate organ perfusion without over hydrating or creating volume overload, which can lead to serious consequences in pulmonary function, will improve outcomes from these injuries. The anticipated redevelopment and deployment of freeze-dried plasma coupled with red-blood-cell infusions that are capable of correcting blood-clotting abnormalities following uncontrolled haemorrhage and reducing irreversible shock are likely to make their appearance in the months and years to follow.

Several new haemostatic agents are in use by the American military. HemCon Medical Technologies manufactures bandages from chitosan, a naturally occurring, biocompatible polysaccharide derived from shrimp shells, which stems the flow of blood. Z-Medica makes a pourable product that uses zeolite-based agents. TraumaCure has recently developed another granular mix for use on gaping wounds. The Army has also issued a one-handed tourniquet, which can be self-applied by the soldier.

A company commander from the Second Infantry Division carries a 'casualty' during the nuclear, biological and chemical section of the Expert Field Medical Badge training at Fort Lewis, Washington, 2006. Photograph by Spc. Leah R. Burton, courtesy of US Army.

Although haemorrhage-control devices can control external bleeding, there is no effective countermeasure to control internal bleeding in the pre-hospital environment. Surgical intervention is required to staunch internal bleeding, but death often occurs before transport to a surgical facility is feasible. Investigators at the CIMIT are studying the potential of a portable insufflator device to control abdominal and thoracic bleeding preoperatively. The method uses carbon dioxide to reduce the rate of bleeding. Preliminary tests suggest that this technique may be useful in the pre-hospital management of abdominal injury to effectively temporise bleeding until transfer to the operating room.

THE NEW MEDIC

Historically, care rendered in the first hour (the 'golden hour') following injury has been considered most critical to survival. Today, the critical timeframe is considered to be the initial five to ten minutes.

Medics and combat lifesavers are often tasked not only with treating single serious casualties, but also multiple casualties simultaneously. In response, since the start of the Iraq War, the American Army has increased the training time for combat medics to 16 intensive weeks, which provides the skill level of a civilian emergency medical technician or ambulance medic.

HOW TO TRAIN THE 'LIFE SAVERS'

Currently, medic training consists of a combination of classroom, field instruction and mannequin training, the majority of which is in the field. The chaotic nature of the battlefield makes it difficult to assess patients; yet survival is dependant upon the medic's skill level. If the medic incorrectly inserts a chest tube or IV, or misses an internal injury, the patient will not survive transport to a treatment facility.

New highly realistic simulation systems are being developed by researchers, including CIMIT, to train combat medics in the treatment of traumatic injuries under battle conditions. The Combat Medic Training System's (COMETS) prototype mannequins mimic combat war wounds with extreme realism, replete with spurting blood, sucking chest wounds, and shrieks

SAVe: Simplified Automated Ventilator
Courtesy AutoMedx Inc, Germantown MD

of pain. Unlike the plastic models familiar from CPR class, these mannequins, with imitation blood and synthetic skin, truly simulate the human body, and provide realistic representations of trauma wounds and responses to therapy, and thus enable training on complex medical conditions in a field-like setting. Sensors record all treatment and responses, providing the user with immediate feedback on care delivered.

TRANSPORT AND SURVIVAL

The changing battlefield has precipitated improvements in transport. Warfare has shifted from formation/trench fighting to a more urban and fluid battlefield, which facilitates a faster access to medical treatment. During Vietnam, the average time of transfer to a CONUS facility was 45 days; in Iraq, an injured soldier can be transported to an Echelon four trauma centre in Landstuhl, Germany, in as few as 12 hours, and be back in America for complete care within three days of the original event.

Combat injuries requiring respiratory management are often lethal if not treated within a few minutes after injury. Currently, bag-valve mask units are used on the battlefield, but their operation requires constant and steady manual pumping, which does not guarantee consistent air delivery. A new portable ventilator, The SAVe (Simplified Automated Ventilator) could provide the critical difference in survival outcomes for injured soldiers requiring immediate airway management. The SAVe

NIRVANA: Non-Ionizing Radiation Vision for A New Army.
Courtesy Spectral Energetics Inc, Beavercreek OH

uses single-knob, hands-free operation to deliver precise, measured breaths. Weighing roughly three pounds, the SAVe is small and durable enough to be stored in a medical kit or on far-forward evacuation vehicles.

Other dramatic improvements in the ability to deliver mechanical support for ventilation and circulatory support are anticipated through the use of servo-controlled or robotic controlled devices that not only deliver information about the status of the patient's care but also simultaneously correct for variances in the patient's response to treatment. Greater emphasis is being placed on the accelerated development of drugs and treatment modalities that reduce systemic metabolism, reduce oxygen consumption, oxygen demand, and glucose utilisation, thus reducing overall free-radical generation and improving longer-term survivability.

IT'S ALL ABOUT INFECTION

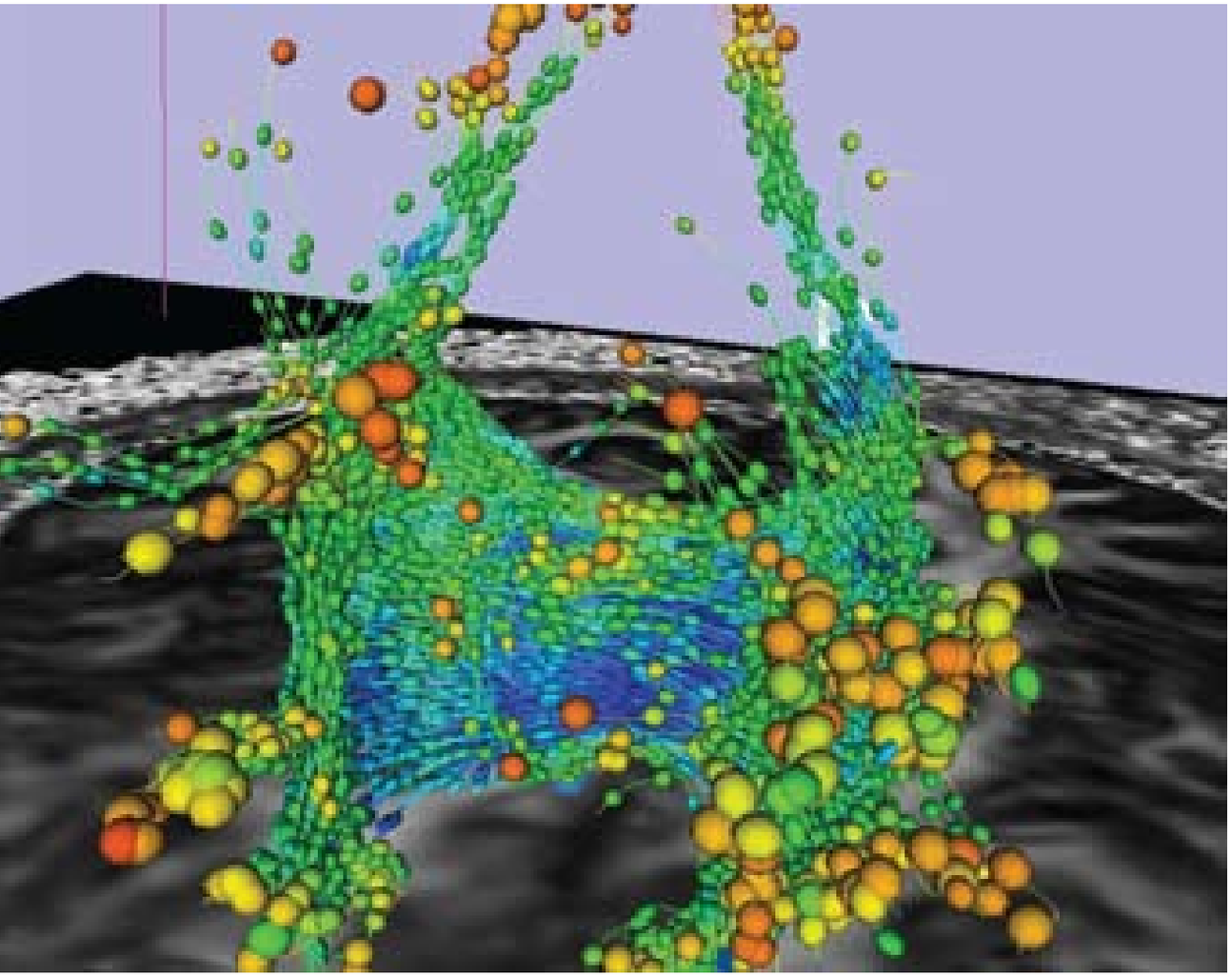
Bacteria infection remains a serious complication of war trauma. New therapies must be investigated to prevent and treat multi-drug-resistant microbes, particularly for soft tissue blast and thermal injuries. IEDs, which cause ultra-high-velocity fragmentation injuries, often to the extremities, are frequently packed with contaminated soil or other objects, which increases the likelihood of secondary infection. The average wound from an IED requires five surgeries.

ACINOBACTER

Acinetobacter baumannii, a bacterium found in soil and water highly prevalent in Iraq, has resulted in numerous wound, respiratory and bloodstream infections in injured soldiers. These infections are challenging to treat due to extensive antimicrobial drug resistance, yet they are occurring with increased frequency in military medical facilities treating soldiers returning from Iraq. *Acinetobacter* spores can survive on surfaces for up to 20 days, increasing the likelihood of infection amongst other patients.

SEPSIS

Antibiotics are the standard treatment for sepsis, but because of the delay in drug effect, potentially fatal inflammation

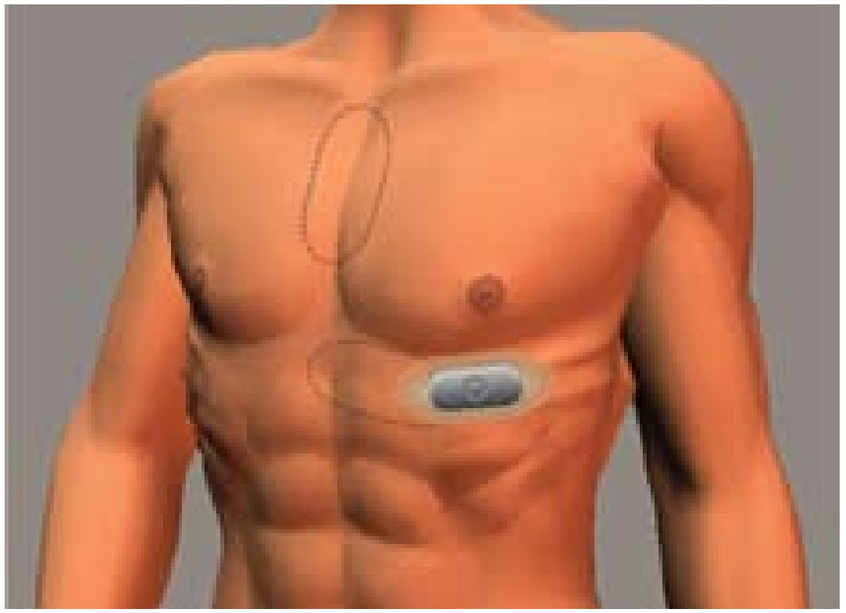


Diffusion Tensor Imaging of the brain.
Courtesy of BWH Surgical Planning Lab, Boston MA.

continues to spread. Researchers from Children's Hospital Boston are developing a sort of 'artificial spleen' that can be used in tandem with antibiotic therapy. This device temporarily removes blood from the body via a catheter, filters pathogens out of the blood, and returns the cleaned blood back to the body. Work is underway to increase the prototype's capacity and efficiency, with support from CIMIT.

THE BRAIN UNMASKED

Traumatic Brain Injury (TBI) is a predominant cause of injury for soldiers in Iraq with implications for long-term health concerns. There is a dramatic rise in both open and closed (concussive) head injuries due to increased use of improvised explosive devices (IED). Although Kevlar helmets have reduced the number of fatal penetrating head wounds, force momentum can result in a severe concussive injury. According to the Defense and Veterans Brain Injury Center, about 900 soldiers have suffered a serious debilitating traumatic TBI; additionally, an estimated 300,000 soldiers have suffered milder forms of TBI, including brief loss of consciousness, disorientation or cognitive lapses.



CIMIT Prototype 'band-aid' monitor
Courtesy CIMIT, Boston, MA.

IEDs have intensified the need for protection against the blast wave itself. Blast waves can cause serious injuries, from pulmonary haemorrhage to progressive brain trauma. Current ceramic body armour is only effective against projectiles, such as shrapnel and bullets. Preliminary research supported by CIMIT to test the feasibility of using machine-augmented composites (MAC) as blast armour demonstrated that the MAC material mitigated blast by 9.5 per cent.

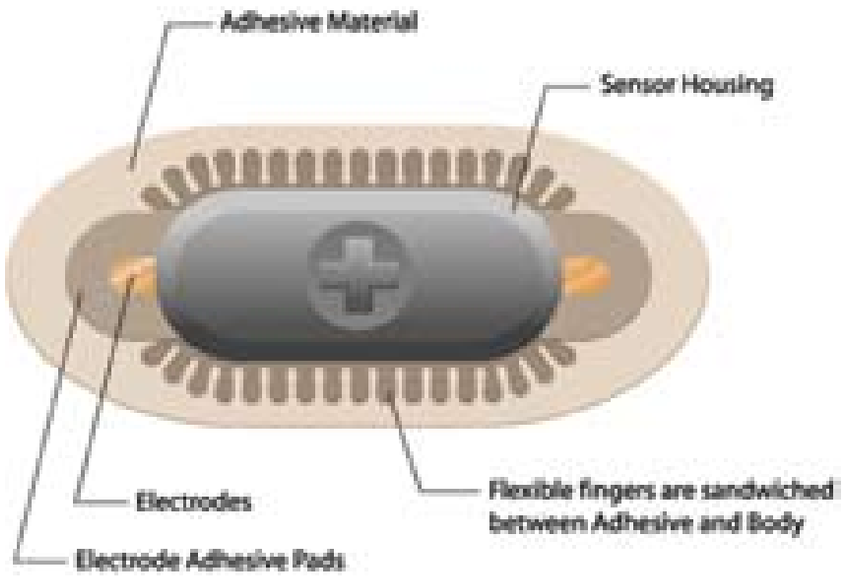
The Preventing Violent Explosive Neurologic Trauma (PREVENT) Program is investigating methods to protect soldiers from TBI resulting from IED explosions. This program focuses on evaluating the physics of interaction between an IED blast and the neurological system to determine the components responsible for neurologic injury, and developing improvements in personal protective armour and new therapeutic interventions for injured soldiers.

Researchers at Brigham and Women's Hospital are investigating the use of Diffusion Tensor Imaging (DTI), a relatively new imaging technique that provides a detailed three-dimensional map of white matter in the brain. With this technique, it may be possible to identify and track variations and changes in the brain resulting from PTSD and TBI, as well as to differentiate between the two disorders.

WHAT HAS STAR TREK TAUGHT US?

In television shows and movies, high-tech devices and therapies seem capable of treating any illness. Dr McCoy waves a device the size of a cell phone over a patient's body and seconds later, the patient is cured. The blind Chief Engineer Geordi La Forge wears a special neural implant visor in order to see.

While some of the *Star Trek* devices are still futuristic, they no longer seem unimaginable. The military has recognised that the future of battlefield medicine will require pre-hospital support devices with greater diagnostic and decision-making capabilities. Although medical care is most critical within the first few minutes following combat injury, and delay in recognition and treatment can exacerbate the condition, there are limited pre-hospital diagnostic capabilities available to validate common battlefield injuries. Additionally, a medic



CIMIT Prototype 'band-aid' monitor
Courtesy CIMIT, Boston, MA.

may be diverted by other obvious injuries as well as other simultaneous casualties. Experimental prototype diagnostic ensembles are under development to identify and confirm militarily trauma currently undetectable in the field.

The Defense Advanced Research Projects Agency (DARPA) is sponsoring the Non-Ionizing Radiation Vision for A New Army (NIRVANA) project, whch offers the potential to bring hospital diagnostic capability right to the scene of injury. NIRVANA is a small, handheld electromagnetic-based interrogation device designed to detect and quantify free fluid (air, water or blood), in order to identify the presence of life-threatening lung and chest collapse with sufficient accuracy to permit the on-site insertion of a chest tube by non-physician medical personnel in situations where X-ray is not available.

CIMIT has developed prototype miniaturised, body-worn 'band-aid' monitors equipped with sensors to monitor heart rate, respiration, motion and temperature for the American military to provide remote surveillance and improved triage.

The Digital Diagnostic Glove is another experimental prototype diagnostic ensemble under development. This device is worn by a battlefield medic on the hand and connected to a body-worn computer system. A medic can gather temperature and blood oxygen levels, blood pressure, respiration and heart-rate information on multiple patients in the field, and track their progress, even during hazardous conditions such as heavy fire. This system links to a series of critical diagnostic sensors and arrays, comparing the 'normal' values and ranges against those continuously read for each vital sign measured, and recognises signals, patterns and critical vital-signs changes and responses to therapy. Alarms alert the user or standby personnel to unsafe and life-threatening conditions.

This research suggests that the battlefield medical care of the future will evolve rapidly to greater and more comprehensive capabilities for quick diagnostic assessment of injury and the introduction of therapeutic interventions earlier in the combat cascade designed not only to reduce mortality, but to improve outcome and survivability and reduce morbidity following combat injury.

Digital Diagnostic Glove
Courtesy Sekos Inc, Germantown, MD.

Much of this has to do with modern electronics, sensors and miniaturised devices, which can be used to diagnose treatable conditions that are often lethal if unrecognised, such as pneumothorax, haemothorax and hidden haemorrhage. Improved diagnostic tools will enable early triage, treatment and transportation of injured soldiers, and facilitate the management of multiple casualties simultaneously. Ultimately, it is anticipated that these devices will be used in nursing-home facilities and as an adjunct to home-healthcare for chronic illness management.

THE BIONIC MAN

The war in Iraq and Afghanistan has resulted in over 1,000 traumatic amputations. Limb-loss has occurred twice as often in Iraq than in any conflict of the past century, except for Vietnam, for which there are no good statistics. As of February 2008, the DOD reported 1,031 amputees, of whom 730 have suffered major limb amputations, primarily the result of IED injury. This has spurred the development of the 'Bionic Man'. Improvements in prosthetics and cybernetics are narrowing the gap between prosthetics and actual body parts. Although still under development, research headed by Johns Hopkins Applied Physics Laboratory has created a prototype prosthetic arm that allows for unprecedented movement. The arm provides sensations that allow wearers actually to feel the sensation of holding objects as well as temperature in their prosthetic hand. Because it swings freely like a natural arm, it does not upset balance while walking. While work is still needed to perfect weight and power to ensure wearer comfort, these arms are an example of a major breakthrough in prosthetic research, and offer a greatly improved quality of life to amputees.

CONCLUSION

While it is too soon to determine the impact of the War in Iraq and Afghanistan on the future of medical and mental-health care, it is easy to see how these developments will improve the overall casualty survival rates in the near future. If history is any guide, our future generations will benefit in ways that we can only glimpse today and will result from the focus and determination to advance the protection of soldiers from the catastrophe of warfare.

NOTES

SISTER M ALOYSIUS DOYLE: THE CRIMEAN JOURNALS OF THE SISTERS OF MERCY, 1854–56

Sister M Aloysius Doyle

[1] A flannel or piece of cloth soaked in hot water, wrung out and applied to wounds, Poultices were used much like compresses to draw out toxins and deliver heat and circulation to the assigned area.

[2] A type of starch made from the powdered pith of the sago plant and used in puddings; A plant from which a starch is prepared and used for nutritional and medicinal purposes.

HOW VARIED THE IMAGE OF HEART TRAUMA HAS BECOME

THE DEVELOPMENT OF CARDIOVASCULAR SURGERY DURING THE FIRST WORLD WAR

Susanne Hahn

[1] Ludwig Rehn, "Die Kriegsverletzungen des Herzens und des Herzbeutels", in Otto von Schjerning (ed), *Handbuch der ärztlichen Erfahrungen im Weltkriege 1914–1918*, vol VI; "Chirurgie", Erwin Payr and Carl Franz (eds), Johann Ambrosius Barth, Leipzig, 1922, pp. 799, 815.

[2] T Deneke, "Die Verletzungen des Herzbeutels, des Herzens und der großen Gefäße' in ibid, vol IX; "Röntgenologie", Rudolf Grashey (ed), Leipzig, 1922, p. 198.

[3] Hermann Merkel, "Schuß-und Stichverletzungen des Herzens, Herzbeutels sowie der großen Gefäße", in ibid, vol VIII; "Pathologische Anatomie", Ludwig Aschoff (ed), Leipzig, 1921, p 463.

[4] A Kappis, "Ueber Schußverletzungen der großen Gefäße", *Deutsche Medizinische Wochenschrift* 40 (1914), p. 2120.

[5] T Deneke, "Die Verletzungen des Herzbeutels, des Herzens und der großen Gefäße" in Otto von Schjerning, op cit, vol IX; "Röntgenologie", Rudolf Grashey (ed), Leipzig 1922, p. 198.

[6] Alexander Moritz Frey, *Die Pflasterkästen. Ein Feldsanitätsroman*, Kiepenheuer, Berlin, 1929; reprint, Leipzig & Weimar, 1984, pp. 201–202.

[7] Erich Maria Remarque, *Im Westen nichts Neues*, Kiepenheuer & Witsch, Cologne, 1987, p. 84.

LIFE WITHOUT ARMS:

CARL HERMANN UNTHAN AND HIS MOTIVATIONAL WORK WITH DISABLED VETERANS IN GERMANY

Colleen Schmitz

[1] Carl Hermann Unthan, *Das Pediskript*, Robert Lutz Verlag GmbH, Stuttgart, Second edition, 1925, pp. 267–278.

[2] Unthan, *Das Pediskript,* p. 268.

[3] Unthan, *Das Pediskript,* pp. 270-75.

[4] Unthan, *Das Pediskript,* p. 270.

[5] Karl August Lingner, Introduction to *Ausstellung für Verwundeten-und Krankenfürsorge im Kriege*, 1915, p V.

[6] Carl Hermann Unthan, *Ohne Arme durchs Leben*, G Braunsche Hofbuchdruckerei und Verlag, Karlsruhe, 1916, p. 48.

[7] Unthan, *Ohne Arme durchs Leben* p. 50.

[8] Unthan, *Ohne Arme durchs Leben* p. 5.

[9] Unthan, *Das Pediskript*, 1925, p. 268.

[10] Unthan, *Ohne Arme durchs Leben*, pp. 5–6.

[11] Unthan, *Ohne Arme durchs Leben* p. 6.

[12] Unthan quoted in Hans Würz, *Sieghafte Lebenskämpfer*, Munich, 1919, p. 24.

[13] Unthan, *Das Pediskript*, p. 271.

[14] Unthan, *Das Pediskript,* p. 279.

[15] Unthan, *Ohne Arme durchs Leben*, p. 2.

SOLDIERS' BODIES IN THE WAR MACHINE:

TRIAGE, PROPAGANDA AND MILITARY MEDICAL BUREAUCRACY, 1914–1918

Ana Carden-Coyne

[1] Major Blackwood, RAMC, 'Treatment of Wounds from First Trench to Field Ambulance', *Royal Army Medical Corps, 3rd Corps Medical Society*, p. 230.

[2] Captain DWJ Andrews, RAMC, war diary, 30 August 1915, p. 7; RAMC 2021, Wellcome Collection, London.

[3] Andrews, 30 August 1915.

[4] Captain Henry W Kaye, RAMC war diary, Saturday 3 July 1915, p. 71; RAMC 739/5 Wellcome Collection.

[5] Kaye, 14 July 1915, p. 91.

[6] Kaye, 24 May 1916, p. 242.

[7] Kaye, 23 September 1915, p. 189.

[8] *With the Forty-Fourths. Being a Record of the Doings of the 44th Field Ambulance (14th Division)*, Spottiswoode, Ballantyne and Co, London, 1922, p. 37.

[9] Kaye, 9 November 1915, p. 33.

[10] Basil Clarke, "How the Wounded Were Brought Home", *The Great War: the Standard History of the All-Europe Conflict*, ed. HW Wilson, vol 8, 24 February 1917, p. 326.

[11] Private Percy Bray, war diary, RAMC 1673, Wellcome Collection.

[12] Kaye, 24 January 1916, p. 109.

[13] Kaye, 1 November 1915, p. 22.

[14] Laura Doan, "Primum Mobile: Women and Auto/mobility in the Era of the Great War", *Women: A Cultural Review*, 17, 1, 2006, pp. 34–35.

[15] Andrews, 30 July 1915, p. 3.

[16] Notes by Dr Buttar. Interview with Captain Hebb, RAMC, TC, CO 17th Field Ambulance', 16 September 1917, p. 1; RAMC 1165/2/3, Wellcome Collection.

[17] "The Royal Army Medical Corps and Its Work", *British Medical Journal*, 18 August 1917, p. 217.

[18] "Barge Ambulances. Floating Hospitals for Wounded", *The Times*, Thursday 15 October 1914, p. 9.

[19] "How the Wounded Were Brought Home", *The Great War Magazine*, Part 132, February 1917, p. 326.

[20] Lord Knutsford, Letter to the Editor, "Our Wounded in France. Efficient Treatment", *The Times*, Tuesday 10 November 1914, p. 9.

[21] Percy Dunn, FRCS, "Healing in the Field. Work of the Army Medical Service. Great Achievements", *The Times*, Thursday 21 September 1916, p. 3.

[22] Lord Northcliffe, "The War Doctors. Their Life Under Fire", *The Times*, Wednesday 4 October 1916, p. 9.

[23] The Editor, "The Medical Army", *The Times*, Wednesday 4 October 1916, p. 9.

[24] M Anne Crowther and Marguerite W Dupree, *Medical Lives in the Age of Surgical Revolution*, Cambridge University Press, Cambridge, p. 347.

[25] Confidential Memorandum, Sir Alfred Fripp, Sir Alexander Ogsten, Sir Cooper Perry and Dr TJ Horder, 1916; Sir Charles Burtchaell Papers, RAMC 446/13, Wellcome Collection.

[26] Committee Interview with Colonel Burtchaell, Army Medical Corps, "Meeting on the Evening of Arrival in France, 1st September 1917, Hotel Delveaux, Boulogne", 1917, p. 4; RAMC 1165/2, Wellcome Collection.

[27] Harold Dearden, *Medicine and Duty: A War Diary*, Heinemann, London, 1928, p. vii.

[28] Kaye, 22 April 1916, p. 216.

[29] Committee Interview with Sir J Rose Bradford, Consulting Physician, Etaples, 5 September 1917, p. 3.

[30] Committee interview with Surgeon General Sir Anthony Bowlby, Colonel Sir Wilmot Herringham, consultant physician, Surgeon General Macpherson, "Meeting at General Headquarters", 2nd Echelon, Hesdin, France, RAMC 1165/2/3, Wellcome Collection, p. 6.

[31] Committee Interview with Colonel Burtchaell, p. 3.

[32] Fripp, Ogsten, Perry and Horder, 1916.

[33] Captain Harold Upcott, war diary, 1 April 1918; RAMC 1101, Wellcome Collection.

[34] Anonymous Patient, "A Quaint Character", *FEG Hospital Gazette*, vol 1, no 6, 22 June 1915, p. 98.

[35] The Editor, "The Medical Army", *The Times*, 4 October 1916, p. 9.

[36] Captain C Rhodes Marrison, "3rd L.G.H. Labour-saving Devices for the Reception of the Wounded", *The Gazette*, February 1916, p. 131.

TREATED LIKE FLOWERS:

THE INDIAN ARMY AT THE ROYAL PAVILION HOSPITAL, BRIGHTON, 1914–1916

Kate Forde and Lucy Shanahan

The authors would like to thank Joyce Collins at Brighton Museum and Library for her advice and assistance.

[1] *The Brighton Herald*, 5 December 1914.

[2] *The Brighton Herald*, 19 December 1914.

[3] 'Indo-Saracenic' is derived from *Saracen*, an archaic name for Muslims.

[4] *The Brighton Herald*, 5 December 1914

[5] *A short history in English, Gurmukhi and Urdu of the Royal Pavilion, Brighton, and a description of it as a hospital for Indian soldiers*, King, Thorne & Stace, Brighton, 1915.

[6] David Omissi, "India and the Western Front", at www.bbc.co.uk/history, accessed July 2008.

[7] Michael O'Dwyer (Governor of the Punjab), *India as I knew It: 1885–1922*, Constable & Co, London, 1925.

[8] The Brighton Workhouse was also rapidly transformed into the Kitchener Indian Hospital, and other substantial premises in York Place were made available.

[9] *The Argus*, 28 November 1914.

[10] The King and his wife Queen Mary made formal visits to the pavilion twice during the 14 months that it served as a hospital, on 9 January and 25 August 1915. On each occasion the couple inspected the premises and interacted with the Indian patients, giving the local press great opportunities for yet more colourful reporting.

[11] *The Argus*, 24 November 1914, quoting a "distinguished officer" from the War Office.

[12] *A short history in English, Gurmukhi and Urdu of the Royal Pavilion, Brighton, and a description of it as a hospital for Indian soldiers*, King, Thorne & Stace, Brighton, 1915

[13] *The Brighton Herald*, 5 December 1914.

[14] *The Brighton and Hove and South Sussex Graphic*, 8 July 1915.

[15] Even in a cursory examination of the representation of race such as this, it is worth citing Edward Said's classic text, *Orientalism*, Routledge and Keegan Paul, London, 1978, which critiques exoticising Western constructs and assumptions about the Orient.

[16] The memorabilia documenting this episode was intended, as Susan Stewart has remarked of the souvenir, to "move history into private time" The simple purchase of a postcard provides evidence of a lived experience, connecting the individual with a momentous occasion or remarkable sight. Susan Stewart, *On Longing: Narratives of the Miniature, the Gigantic, the Souvenir, the Collection*, Duke University Press, Durham & London, 1993, p. 138

[17] It has been observed that "no photograph is so successful that it filters out the random entirely". Christopher Pinney and Nicolas Peterson, *Photography's Other Histories*, Duke University Press, Durham & London, 2003, p. 7.

[18] *The Brighton Herald*, 19 December 1914.

[19] David Omissi, *The Sepoy and The Raj: The Indian Army, 1860–1940*: Macmillan Press Ltd, London, 1994, p. xviii.

[20] Isar Singh (Sikh, 29th Rifles) to a friend (50th Punjabis, India), 1 May 1915, Brighton, cited by David Omissi, *Indian Voices of the Great War: Soldiers' Letters*, 1914–1918, Macmillan Press Ltd, London, 1999, p. 59.

[21] Cited by John Mack in "Medicine and Anthropology in Wellcome's Collection" in Ken Arnold and Danielle Olsen, *Medicine Man: The Forgotten Museum of Henry Wellcome*, The British Museum Press, London, 2003, p. 215.

SUFFERING AND THE HEALING PROFESSION:

THE EXPERIENCE OF MILITARY MEDICINE IN THE FIRST AND SECOND WORLD WARS

Joanna Bourke

[1] Wilfred Willett, "Memoirs", 81, Imperial War Museum archives.

[2] Lieutenant Kaye, "Papers and Letters", letter to Mrs Kaye from Nurse J Badger, 29 January 1917, IWM 82/11/1.Capitalisation and punctuation as in the original.

[3] John Rawlings Rees, *The Shaping of Psychiatry by War* Chapman and Hall, London, 1945, p. 19.

[4] Charles Huxtable, *From the Somme to Singapore*, Costello, London, 1987, pp. 29–30.

[5] KR Eissler, *Freud as an Expert Witness: the Discussion of War Neuroses Between Freud and Wagner-Jaugegg*, translated by C Trollope, International Universities Press, Inc, Madison, Connecticut, 1986, pp. 60–61.

[6] Major Stanley Argyle, "War Diary", part I, entry for 12 May 1915, Australian War Memorial archives.

[7] Richard A Gabriel and Karen S Metz, *A History of Military Medicine*, Greenwood Press, Westport 1992, pp. 254–255.

[8] Dr Robert Scot Skirving, *Memoirs of Dr Robert Scot Skirving 1859–1956*, ed Ann Macintosh, Foreland Press, Darlinghurst, 1988, p. 231.

[9] MR Werner, *Orderly!*, Jonathan Cape, New York, 1930, p. 66.

[10] Emlyn Williams, "Appeal for the Central Council for the Care of Cripples", in *News Letter. Circulated by the Central Council for the Care of Cripples*, 7 (July 1941), p. 5.

[11] HH Thomas, *Help for Wounded Heroes*, Essential Limb Co, London, 1920, p. 1.

[12] "The Disabled Soldier", *Liverpool Chronicle*, 27 June 1917.

[13] GH Slade, *Two Sticks*, Mills and Boon, London, 1923, p. 96.

[14] Rt Hon Ernest Brown, "Fractures in Wartime", in *News-Letter. Circulated by the Central Council for the Care of Cripples*, no 6 (April 1941), p. 5.

[15] M Creach-Henry and D Marten, *The Unknown Warrior*, Society for Promoting Christian Knowledge, London, 1923), p. 5.

[16] Private Arthur H Hubbard, "Letters Written May—November 1916", Imperial War Museum archives.

[17] Quoted by Harvey Cushing, *From a*

Surgeon's Journal 1915–1918, Constable and Co, London, 1936, p. 489.
[18] Miss Dorothy Scholes, "Papers of Miss Dorothy Scholes", scrapbook belonging to Dorothy Scholes, nurse at a military hospital, Edward Hall Collection, Wigan Archives Service. Punctuation and spelling as in original.
[19] William Needles, "The Regression of Psychiatry in the Army", *Psychiatry*, 9.3 (August 1946), p. 176.
[20] Sir George H Savage, "Mental Disabilities for War Service", *The Journal of Mental Science*, Lxii.259 (October 1916) p. 656.
[21] Frederick W Mott, *War Neuroses and Shell Shock*, Henry Froude, London, 1919), p. 110.
[22] Lieutenant Colonel Philip S Wagner, "Psychiatric Activities During the Normandy Offensive, June 20–August 20, 1944", *Psychiatry*, 9.4 (November 1946), p. 348.
[23] George Rutherford Jeffery, "Some Points of Interest in Connection with the Psychoneurosis of War", *The Journal of Mental Science*, lxvi.273 (April 1920), p. 140.
[24] General George Patton, cited in John Laffin, *Surgeons in the Field*, J M Dent and Sons, London, 1970, p. 285.
[25] De Witt Mackenzie, *Men Without Guns*, The Blakistan Co, Philadelphia, 1945, p. 30.
[26] William Wallace, "The Vision of the Soldier, With Special Reference to Malingering", *Journal of the Royal Army Medical Corps*, xxxvii.1, July 1921, p. 43.
[27] John William Roworth [Edward Casey], "The Misfit Soldier", 32 and 41, Imperial War Museum archives. See Joanna Bourke (ed), Introduction to the *The Misfit Soldier*, Cork University Press, Cork, 1999.
[28] Lieutenant Colonel Albert Groves Hulett, "Malingering—A Study", *The Military Surgeon*, 89.2 (August 1941), p. 138.
[28] Lieutenant AG May, "Personal Experiences of the War Years 1915–1917", p. 32, Imperial War Museum.
[29] Captain Alfred O Ludwig, "Clinical Features and Diagnosis of Malingering in Military Personnel. Use of Barbiturate Narcosis as an Aid in Detection", *War Medicine*, 5.6 (June 1944), p. 381.
[31] Major James A Brussel and Lieutenant Kenneth S Hitch, "The Military Malingerer", *The Military Surgeon*, 93.1 (July 1943), p. 35.
[32] G Elliott Smith and TH Pear, *Shell Shock and Its Lessons*, Manchester University Press, Manchester, 1919), p. 2.
[33] Captain L. Gameson, "Diary", 56, Imperial War Museum archives.
[34] Wilfred Willett, 'Memoirs', 104, Imperial War Museum archives.

STALINGRAD:
WOUNDED BODIES AND SOULS
Wolfgang U Eckart

[1] See Wolfgang, U Eckart, "Von der Agonie einer mißbrauchten Armee—Anmerkungen zur Verwundeten-und Krankenversorgung im Kessel von Stalingrad", in Wolfram Wette, Gerd R Ueberschär (eds), *Stalingrad—Mythos und Wirklichkeit einer Schlacht*, Fischer, Frankfurt, 1992, pp. 108–30, on which the present contribution is based.
[2] Hans Dibold, *Arzt in Stalingrad. Passion einer Gefangenschaft*, O Müller, Salzburg, 1949, epilogue, p. 215. I would like to thank Dr Gerd R Überschar (MGFA, Freiburg im Breisgau) for his help in the search for files.
[3] V Orator, *Leitfaden der Feldchirurgie im Bewegungskrieg*, Johann Ambrosius Barth, Leipzig, 1943, p. 24.
[4] Surgeon-General Renoldi to HQ, Sixth Army, Stalingrad, 18 November 1942, Bundesarchiv Militärarchiv, Freiburg, RH 20-6/792.
[5] The true number of physicians trapped within the encirclement of Stalingrad cannot be established today. Certainly there were more than the 23 medical officers listed by Manfred Kehrig, but rather fewer than 600, the number recalled by Hans Girgensohn, who was flown into the encirclement as an army pathologist.
[6] G Toepke, *Stalingrad wie es wirklich war*, Kogge-Verlag, Stade, 1949, p. 83.
[7] Hans Girgensohn, "Als sie einfach starben—Vor dreißig Jahren: Von Hungertod, wagte in Stalingrad niemand zu reden", in *Die Zeit*, 6, 2 February1973, p. 44. All subsequent quotations from Girgensohn are from this source.
[8] Toepke, op cit, pp. 83–4.
[9] Erich Weinert, *Memento Stalingrad. Frontnotizbuch, Worte als Partisanen. Aus dem Bericht über das Nationalkomitee 'Freies Deutschland'*, W Bredel, Berlin 1960, p. 122.
[10] Toepke, op cit, p. 68.
[11] Renoldi to Chief Quartermaster, Sixth Army, Stalingrad, 6 January 1943, BA-MA RH 20-6/796.
[12] Stabsarzt Seggel to Army Physician, Sixth Army, Stalingrad, 2 December 1942, BA-MA RH 20-6/792.
[13] Army physician quoted in Alexander Kluge, *Schlachtbeschreibung*, Walter-Verlag, Olten, 1964, p. 132.
[14] Alexander Kluge, *Schlachtbeschreibung*, p. 132.
[15] KTBOQu. for the Sixth Army, Stalingrad, 29 November 1942, BA-MA RH 20-6/794.
[16] Army Physician, quoted in Kluge, op cit, p. 219.
[17] Kluge, p. 219.
[18] Kluge, p. 219.
[19] Renoldi in a telephone conversation with Toepke on 15 December 1942, in Toepke, op cit, p. 56.
[20] H Seile, *Die Tragödie von Stalingrad. Der Untergang der 6. Armee*, Verlag "Das andere Deutschland", Hannover, 1948, p. 9.
[21] G. Girgensohn, née Vleugels, in a letter to the author, Freiburg, 11 January 1992.
[22] Captain Mayer, Squadron Leader 9/K.G. 27, 21 January 1943, report on the loading conditions at Gumrak, BA-MA RL 30/3.
[23] Radio message from the aircraft Odysseus 17 (pilot Oberfeldwebel Schmidt), 19 January 1943, airfield at Gumrak BA-MA RL 30/3.
[24] Toepke, op cit, p. 80; for the following quotations see pp. 78–80.
[25] Quoted in *Stalingrad: die ersten authentischen Berichte der russischen Generäle Rokossowski–Woronow–Telegin Malinin sowie russischer Kriegsberichterstatter*, Steinberg, Zurich, 1945, pp. 24–5.
[26] HM Waasen, *Was geschah in Stalingrad—Wo sind die Schuldigen?*, Mirabell Verlag, Zell am See/Salzburg, 1950, p. 52.
[27] J Wieder, *Stalingrad und die Verantwortung des Soldaten. Mit einem Geleitwort von Helmut Gollwitzer*, Second ed, Nymphenburger Verl.-Handl, Munich, 1962, pp. 87–8.
[28] Army Commander-in-Chief 6, 1a, to Army Group 'Don', 24 January 1943, BA-MA RH 19 VI/12.
[29] Waasen, op cit, p. 52.
[30] Theodor Plivier, *Stalingrad*, 3rd ed., Aufbau-Verlag, Berlin, 1946, p. 211.
[31] Wieder, op cit, p. 97.
[32] Dibold, op cit, p. 39.
[33] Dibold, op cit, p. 39
[34] Dibold, op cit, p. 14–15.
[35] *Stalingrad*, Liga gegen den Faschismus (League Against Fascism), Stuttgart, 1946, p. 12.
[36] Werner Gerlach, *Das dunkle Tal. Erlebnisbericht eines Arztes von Stalingrad bis Friedland*, Selbstverlag, Ottobrunn, 1980.

DANG THUY TRAM:
LAST NIGHT I DREAMED OF PEACE

[1] In addition to providing medical treatment, Thuy taught young medical workers, mainly in basic nursing skills.
[2] Phosphorous rounds were fired by artillery as 'markers' to locate targets. Although lethal, they were not designed to be used as lethal weapons. When a target was marked with phosphorous, it might then be bombed with napalm. It is not clear whether the young man was hit with a phosphorous round or burned as the result of an accident.

WHY THE PSYCHIATRY OF WAR IS TOO IMPORTANT TO BE LEFT TO PSYCHIATRISTS
Ben Shephard

[1] J Stiglitz and L Bilmes, *The Three Trillion Dollar War. The True Cost of the Iraq Conflict*, Allen Lane, London, 2008.
[2] See TE Ricks, Fiasco. *The American Military Adventure in Iraq*, Penguin, New York, 2006.
[3] See B Shephard, *A War of Nerves. Soldiers and Psychiatrists in the Twentieth Century*, Harvard University Press, Cambridge, Mass, 2001.
[4] The resolution of a neurosis by reviving repressed or forgotten ideas of an event.
[5] B Shephard, '"Pitiless psychology': the role of prevention in British military psychiatry during the Second World War", *History of Psychiatry*, 10 (1999), pp. 491–514.
[6] DK Henderson and RD Gillespie, *Textbook of Psychiatry*, Oxford University Press, London and New York, 1950.
[7] Quoted in Shephard, *A War of Nerves*, p. 164.
[8] Shephard, pp. 396–397.
[9] See LS O'Brien, *Traumatic Events and Mental Health*, Cambridge University Press, New York, 1998; R Yehuda and A Macfarlane, "Conflict between current knowledge about [PTSD] and its original conceptual basis", *American Journal of Psychiatry* 152 (1995), pp. 1705–1713; B Raphael, "Does debriefing after psychological trauma work?", *British Medical Journal* (1995), pp. 149–180. See Shephard, *A War of Nerves*, for further references.
[10] For detailed references see R Leys, *Trauma a Genealogy*, University of Chicago Press, Chicago, 2000; GM Rosen (ed) *Posttraumatic Stress Disorder. Issues and Controversies*, John Wiley & Sons, Chichester, 2004; and "Specila Issue: Challenges to the PTSD Construct and its database", *Journal of Anxiety Disorders* 21 (2007).
[11] See, for example, "D.G. Kirkpatrick, Final editorial", *Journal of Traumatic Stress* 18 (2005), pp. 589–593; *Journal of Traumatic Stress* 20 (2007), pp. 449–493.
[12] Rachel Yehuda is the leading modern researcher into the psychobiology of PTSD. For a general critique, see Raymond Tallis, "The neuroscience delusion", *Times Literary Supplement* 9 April 2008.
[13] Richard A Kulka et al, *Trauma and the Vietnam War Generation*, Brunner/Mazel, New York, 1990. For critiques, see A Young, *The Harmony of Illusions. Inventing Post-Traumatic Stress Disorder*, Princeton University Press, Princeton, 1995 and BG Burkett and G Whitley, *Stolen Valor*, Verity Press, Dallas, 1998.
[14] E Kanter, *Shock and Awe Hits Home. US Health Costs of the War in Iraq*, Washington, DC, 2007; Committee on *Treatment of Posttraumatic Stress Disorder, Treatment of Posttraumatic Stress Disorder: An Assessment of the Evidence*, Washington, DC, 2007.

Artist's Diary, J4MED, Op Herrick 7, 03.11.07–26.11.07
DAVID COTTERRELL

[1] Lt Col Copanni from the Permanent Joint Head-Quarters had been involved in planning and scheduling my training, preparations and deployment to theatre.
[2] The LM (Load Master), is a member of the flight crew on rotary or fixed-wing flights responsible for the cargo.
[3] MED GRP CP (Medical Group Command Post): the main tent accommodation for the management and administration of medical services at Bastion.
[4] DPM (Diffusion Pattern Material): the common abbreviation for camouflage fatigues.
[5] Jono Lee's foot and lower leg were amputated at Selly Oak subsequent to evacuation from theatre. He was heard on Radio 4 in January 2008, expressing his desire to return to Afghanistan to complete his tour of duty.
[6] SIED (Suicide Improvised Explosive Device).
[7] At this point, I was trying to gain permission to travel forward to see the work of the Team Medics, Combat Medical Technicians and Medical Emergency Response Teams at the Forward Operating Base, Sangin, which preceded the treatment I was witnessing at Bastion's field hospital.
[8] ISO containers are the shipping containers widely used for containerised transport. They are widely used by the military for transporting cargo, accommodation and construction within theatre.
[9] Major Ron Russell hosted, guided and escorted me through the majority of my stay in Helmand.
[10] Night Vision Goggles.
[11] Lance Corporal Fletcher made a remarkable recovery. I met with him at Hedley Court rehabilitaion centre in August 2008. Now an outpatient, he had managed to keep his legs, rebuild the strength in them and had just finished a four-mile run.
[12] Bergen is the common name for the standard military issue ruck-sack.
[13] 'Op Minimise' is the military code for suspended non-essential communication. All internet / email and telephone access is blocked for soldiers. Only operational communications are still available. This occurs whenever serious casualties or deaths are reported. The policy is rigorously enforced and is designed to ensure that next of kin are only able to hear news from official channels rather than through rumour or the press. The restriction remains in force until confirmation of communication with families has been received—normally within 24 hours. Op Minimise was intermittently in force for a great deal of the duration of my tour.
[14] In 2006, British and Canadian troops established a Forward Operating Base on the outskirts of Sangin. It is within the poppy-growing region of Helmand province and has been the scene of heavy fighting with Taliban insurgents.
[15] 'Wet' is the Marine term for tea. The marines pride themselves on the retention of naval rather than army terminology.

BIBLIOGRAPHY

WAR AND MEDICINE IN THE MODERN ERA
Mark Harrison

Cirillo, Vincent J, *Bullets and Bacilli: The Spanish American War and Military Medicine*, New Brunswick: Rutgers University Press, 2004
Cooter, Roger, "War and Modern Medicine", in *Companion Encyclopedia of the History of Medicine*, WF Bynum and R Porter, eds, London: Routledge, 1994, pp 1536–73
Cooter, Roger, *Surgery and Society in Peace and War: Orthopaedics and the Organization of Modern Medicine*, 1880–1948, London: Macmillan, 1993
Cooter, Roger, Mark Harrison and Steve Sturdy, eds, *War, Medicine and Modernity*, Stroud: Sutton Publishing, 1998
Cooter, Roger, Mark Harrison and Steve Sturdy, eds, *Medicine and Modern Warfare*, Amsterdam: Rodopi, 1999
Curtin, Philip D, *Death by Migration: Europe's Encounter with the Tropical World*, Cambridge: Cambridge University Press, 1989
Dolev, Eran, *Allenby's Military Medicine: Life and Death in World War I Palestine*, London: IB Tauris Publishers, 2007
Eckart, Wolfgang and Christoph Gradmann, eds, *Die Medizin und der Erste Weltkrieg* Pfaffenweiler: Centaurus-Verlagsgesellschaft, 1996
Guth, Ekkehart, ed, *Voträge zur Militärgeshichte ii: Sanitätswesen im Zweiten Weltkrieg*, Hamburg: Mittler, 1990
Harrison, Mark, *Medicine and Victory: British Military Medicine in the Second World War*, Oxford: Oxford University Press, 2004
Harrison, Mark, "Medicine and the Management of Modern Warfare", *History of Science*, xxxiv, 1996, pp 379–410
Jones, Edgar and Wessely, Simon, *Shell Shock to PTSD: Military Psychiatry from 1900 to the Gulf War*, Hove: Psychology Press, 2005
Lerner, Paul, *Hysterical Men: War, Psychiatry, and the Politics of Trauma in Germany, 1890–1930*, Ithaca & London: Cornell University Press, 2003
Leese, Peter, *Shell Shock: Traumatic Neuroses and the British Soldiers of the First World War*, Basingstoke: Palgrave, 2002
Reznick, Jeffrey S, *Healing the Nations: Soldiers and the Culture of Caregiving in Britain during the Great War*, Manchester: Manchester University Press, 2004
Shephard, Ben, *War of Nerves: Soldiers and Psychiatrists 1914–1994*, London: Jonathan Cape, 2000
Shepherd, John, *The Crimean Doctors: A History of the British Medical Services in the Crimean War*, 2 vols, Liverpool: Liverpool University Press, 1991
Tyquin, Michael, *Gallipoli: The Medical War – The Australian Army Medical Services in the Dardanelles Campaign of 1915*, Kensington: New South Wales University Press, 1993
Whitehead, Ian, *Doctors in the Great War*, Barnsley: Leo Cooper, 1999

THE IMPACT OF THE CRIMEAN WAR ON PUBLIC HEALTH
Hugh Small

Bostridge, Mark, *Florence Nightingale, the Woman and her Legend*, London: Viking, 2008
Eyler, John M, *Victorian Social Medicine: The Ideas and Methods of William Farr*, Baltimore: Johns Hopkins, 1979
Martineau, Harriet, *England and her Soldiers*, London: Smith, Elder & Co, 1859
McDonald, Lynn, *The Collected Works of Florence Nightingale*, Waterloo, Ontario: Wilfred Laurier University Press, 2001
McKeown, Thomas, *The Modern Rise of Population*, London: Arnold, 1976
Nightingale, Florence, *Notes on Hospitals*, London, 1863
Nightingale, Florence, *Notes on Nursing: What It Is and What It is Not*, London: Harrison, 1860
Nightingale, Florence, *A Contribution to the Sanitary History of the British Army*, London: Parker, 1859
"Report of the Commissioners Appointed to Enquire into the Regulations Affecting the Sanitary Condition of the Army", *Parliamentary Papers Vol. XVIII*, London: 1857
Small, Hugh, *Florence Nightingale, Avenging Angel*, London: Constable, 2008
Small, Hugh, *The Crimean War*, Stroud: Tempus Publishing, 2007

HOW VARIED THE IMAGE OF HEART TRAUMA HAS BECOME
THE DEVELOPMENT OF CARDIOVASCULAR SURGERY DURING THE FIRST WORLD WAR
Susanne Hahn

Delius, Ludwig, *Kreislaufkrankheiten und Nierenkrankheiten bei Kriegsbeschädigten: Häufigkeit, Erscheinungsform und Verlauf*, Leipzig: G Thieme, 1936
Eckart, Wolfgang U, "Mitten ins Herz getroffen", in Herz: *Das menschliche Herz—der herzliche Mensch*, Susanne Hahn, ed, Dresden: Verlag der Kunst, 1995, pp 49–68
Eckart, Wolfgang U and Christoph Gradmann eds, *Die Medizin und der Erste Weltkrieg*, Pfaffenweiler: Centaurus-Verlagsgesellschaft, 1996
Fischer-Homberger, *Esther: Die traumatische Neurose—Vom somatischen zum sozialen Leiden*, Gießen: Psychosozial-Verlag, 2004
Lüderitz, Bernd, *Geschichte der Herzrhythmusstörungen: Von der antiken Pulslehre zum implantierbaren Defibrillator*, Berlin: Springer, 1993
Mannebach, Herbert, *Hundert Jahre Herzgeschichte: Entwicklung der Kardiologie 1887–1987*, Berlin, Heidelberg and New York, Springer, 1988
Rosenbusch, Gerd, Matthias Oudkerk and Ernst Amman, *Radiologie in der medizinischen Diagnostik: Evolution der Röntgenstrahlenanwendung 1895–1995*, Berlin and Oxford: Wissenschaftsverlag and Blackwell, 1994
Steffens, Walter, *Herzsteckschüsse*, G Thieme, Leipzig 1936
Ulrich, Bernd and Benjamin Ziemann, eds, *Frontalltag im Ersten Weltkrieg*, Essen, Klartext, 2008
Von Schjerning, Otto, ed, *Handbuch der ärztlichen Erfahrungen im Weltkriege 1914–1918*, Leipzig: Johann Ambrosius Barth, 1922

SOLDIERS' BODIES IN THE WAR MACHINE: TRIAGE, PROPAGANDA AND MILITARY MEDICAL BUREAUCRACY, 1914–1918
Ana Carden-Coyne

Cooter, Roger, *Surgery and Society in Peace and War: Orthopaedics and the Organization of Modern Medicine*, 1880–1948, London: Macmillan, 1993
Cooter, Roger, Mark Harrison and Steve Sturdy, eds, *War, Medicine and Modernity*, Stroud: Sutton Publishing, 1998
Cooter, Roger, Mark Harrison and Steve Sturdy, eds, *Medicine and Modern Warfare*, Amsterdam: Rodopi, 1999
McEwen, Yvonne, *"It's a Long Way to Tipperary": British and Irish Nurses in the Great War*, Dunfirmline: Cualann Press, 2006
Higonnet, Margaret R, ed, *Nurses at the Front: Writing the Wounds of the Great War*, Boston: Northeastern University Press, 2001
Jensen, Kimberly, *Mobilizing Minerva: American Women in the First World War*, Chicago: University of Illinois Press, 2008
Lee, Janet, *War Girls: The First Aid Nursing Yoemanry in the First World War*, Manchester: Manchester University Press, 2005
Tyquin, Michael, *Gallipoli The Medical War: The Australian Army Medical Services in the Dardanelles Campaign of 1915*, Kensington: New South Wales University Press, 1993
Watson, Janet K, *Fighting Different Wars: Experience, Memory and the First World War in Britain*, Cambridge: Cambridge University Press, 2004
Whitehead, Ian, *Doctors in the Great War*, London: Lee Cooper, 1999

LIFE WITHOUT ARMS: CARL HERMANN UNTHAN AND HIS MOTIVATIONAL WORK WITH DISABLED VETERANS IN GERMANY
Colleen Schmitz

Ausstellung für Verwundeten- und Krankenfürsorge im Kriege, Danzig: Zeitschrift für Krüppelfürsorge, 1915
Biesalski, Konrad, *Grundriß einer Krüppelfürsorge*, 3rd edition, Leipzig: 1926
Unthan, Carl Hermann, *Das Pediskript*, 2nd edition, Stuttgart: Robert Lutz Verlag Gmbh, 1925
Unthan, Carl Hermann, *Das Pediskript*, 4th edition, Berlin: Carl Marhold Verlagsbuchhandlung, 1970
Unthan, Carl Hermann, *Ohne Arme durchs Leben*, Karlsruhe: G Braunsche Hofbuchdruckerei und Verlag, 1916
Würz, Hans, *Sieghafte Lebenskämpfer*, Munich: 1919

SUFFERING AND THE HEALING PROFESSION: THE EXPERIENCE OF MILITARY MEDICINE DURING THE FIRST AND SECOND WORLD WARS
Joanna Bourke

Barham, Peter, *Forgotten Lunatics of the Great War*, London: Yale University Press, 2004
Binneveld, Hans, *From Shellshock to Combat Stress*, Amsterdam: Amsterdam University Press, 1997
Bourke, Joanna, *An Intimate History of Killing: Face-to-Face Killing in Twentieth Century History*, New York: Basic Books, 1999
Bourke, Joanna, *Dismembering the Male: Men's Body, Britain, and the Great War*, London: Reaktion, 1996
Bynum, BF, and R Porter, eds, *Companion Encyclopedia of the History of Medicine*, London: Routledge, 1994
Cohen, Deborah, *The War Come Home: Disabled Veterans in Britain and Germany, 1914–1939*, Berkeley and Los Angeles: University of California Press, 2001
Cooter, Roger, Mark Harrison and Steve Sturdy, eds, *Medicine and Modern Warfare*, Amsterdam: Rodopi, 1999

Cooter, Roger, Mark Harrison and Steve Sturdy, eds, *War, Medicine and Modernity*, Stroud: Sutton Publishing, 1998
Harrison, Mark, *Medicine and Victory. British Military Medicine in the Second World War*, Oxford: Oxford University Press, 2004
Leed, Eric J, *No Man's Land: Combat and Identity in World War I*, Cambridge: Cambridge University Press, 1979
Pickstone, John, and Roger Cooter, eds, *Medicine in the Twentieth Century*, **Amsterdam**: Harwood Academic, 2000
Reznick, Jeffrey S, *Healing and the Nation: Soldiers and the Culture of Caregiving in Britain During the Great War*, Manchester: Manchester University Press, 2004

TREATED LIKE FLOWERS: THE INDIAN ARMY AT THE ROYAL PAVILION HOSPITAL, BRIGHTON, 1914–1916

Kate Forde and Lucy Shanahan

A short history in English, Gurmukhi and Urdu of the Royal Pavilion, Brighton, and a description of it as a hospital for Indian soldiers, Brighton: King, Thorne & Stace, 1915
Ken Arnold and Danielle Olsen, *Medicine Man: The Forgotten Museum of Henry Wellcome*, London: The British Museum Press, 2003
Collins, Joyce, *Dr Brighton's Indian Patients*, Brighton: Brighton Books, 1997
Corum, M, et al, *Blighty Brighton*, Brighton: Queenspark Books, 1991
Gooch, Janet, *A History of Brighton General Hospital*, London: Phillimore & Co, 1980
Roberts, HD, *A History of the Royal Pavilion*, London: Country Life, 1939

STALINGRAD: WOUNDED BODIES AND SOULS

Wolfgang U Eckart

Beyer, Falk, *Zur kulturpolitischen Mitarbeit der Schriftsteller Erich Weinert, Theodor Plivier, Johannes R. Becher und Willi Bredel beim Aufbau der Grundlagen eines sozialistischen Verlagswesens in der sowjetisch besetzten Zone Deutschlands von Mai 1945 bis Dezember 1946*, Zwickau: Pädag Hochsch, 1985
Busch, Reinhold, ed, *Die Ärzte von Stalingrad*, 3 vols, Berlin: Wünsche, 2006
Dibold, Hans, *Arzt in Stalingrad: Passion einer Gefangenschaft*, Salzburg: O Müller,1949
Eckart, Wolfgang, U, "Von der Agonie einer mißbrauchten Armee—Anmerkungen zur Verwundeten- und Krankenversorgung im Kessel von Stalingrad", in *Stalingrad—Mythos und Wirklichkeit einer Schlacht*, Wette, Wolfram and Gerd R. Ueberschär, eds, Frankfurt: Gerschichte Fischerm, 1992, pp 108–130
Gerlach, Werner, *Das dunkle Tal. Erlebnisbericht eines Arztes von Stalingrad bis Friedland*, Ottobrunn: 1980
Girgensohn, Hans, "Als sie einfach starben—Vor dreißig Jahren: Von Hungertodwagte in Stalingrad niemand zu reden", in *Die Zeit*, 6, 2 February 1973, p 44
Görlitz, W, "Die Schlacht um Stalingrad 1942–1943", in *Entscheidungsschlachten des Zweiten Weltkrieges, im Auftrag des Arbeitskreises für Wehrforschung, Stuttgart, von Jacobsen*, H-A, and J Rohwer, eds, Frankfurt: 1960, pp 273–322
Guth, Ekkehart ed, *Voträge zur Militärgeshichte ii: Sanitätswesen im Zweiten Weltkrieg*, Bonn: Mittler, 1990
Kehrig, Manfred, *Stalingrad. Analyse und Dokumentation einer Schlacht*, Stuttgart: Deutsche Verlags-Anstalt, 1974.
Keilig, W, *Das Deutsche Heer 1939–1945: Gliederung, Einsatz, Stellenbesetzung*, Bad Nauheim: Podzun Verlag, 1956
Kluge, Alexander, *Schlachtbeschreibung*, Olten and Freiburg: Suhrkamp Verlag, 1964.
Liga gegen den Faschismus (League Against Fascism), ed, *Stalingrad*, Heidenheini: 1946.
Lotte, Ingrid E, *Theodor Plieviers Kriegstrilogie: Moskau, Stalingrad*, Berlin, New York: Columbia University, 1969
Martini, F and G Hay, "Theodor Plivier", in *Kleines Literarisches Lexikon*, 4th ed., Bern and Munich: Horst Francke Verlag, 1973, p 197
Müller, Hans-Harald and Wilhelm Schernus, *Theodor Plievier—Eine Bibliographie*, Frankfurt: P Lang, 1987.
Museteanu, Crisan V, *Frost in der Seele. Erfahrungen und Reflexionen 1942/43*, Berlin: Frieling Verlag, 2004.
Orator, V, *Leitfaden der Feldchirurgie im Bewegungskrieg*, Leipzig, 1943
Plivier, Theodor, *Stalingrad*, Berlin: 1946.
Schober, Karl-Ludwig, *Stalingrad—Befreiung in Gefangenschaft—Ein Bericht*, Halle/Saale: Sekovics, 2002
Seile, H, *Die Tragödie von Stalingrad. Der Untergang der 6. Armee*, Hannover: Das Andere Deutschland, 1948
Stalingrad, Die ersten authentischen Berichte der russischen Generäle Rokossowski, Woronow, Telegin, Malinin sowie russischer Kriegsberichterstatter, Zurich: Steinberg, 1945
Sevin, Dieter H, *Individuum und Staat: Das Bild des Soldaten in Plieviers Romantrilogie*, Bonn: Bouvier, 1972
Steinkamp, Peter, *Generalfeldmarschall Friedrich Paulus — Ein unpolitischer Soldat?*, Erfurt: Sutton, 2001.
Toepke, G, *Stalingrad wie es wirklich war*, Stade: Kogge-Verlag, 1949
Ulrich, Bernd, *Stalingrad*, Munich: Beck, 2005
Waasen, HM, *Was geschah in Stalingrad—Wo sind die Schuldigen?* Zell am See and Salzburg: Mirabell Verlag, 1950
Weinen, E, *Memento Stalingrad: Frontnotizbuch, Worte als Partisanen. Aus dem Bericht über das Nationalkomitee „Freies Deutschland"*, Berlin: W. Bredel, 1960
Wieder, J, *Stalingrad und die Verantwortung des Soldaten*, 2nd ed., Munich: Nymphenburger Verlagshandlung, 1962
Wilde, Harry: *Theodor Plievier—Nullpunkt der Freiheit—Biographie*, Munich, Vienna and Basel: Kurt Desch, 1965
Zank, Horst, *Stalingrad—Kessel und Gefangenschaft*, 4th ed., Hamburg: Mittler, 2004

WHY THE PSYCHIATRY OF WAR IS TOO IMPORTANT TO BE LEFT TO PSYCHIATRISTS

Ben Shephard

Binneveld, Hans, *From Shellshock to Combat Stress: A Comparative History of Military Psychiatry*, Amsterdam: Amsterdam University Press, 1997
Brewin, Chris, *Posttraumatic Stress Disorder: Malady or Myth?*, New Haven: Yale University Press, 2003
Burkett BG and Glenna Whitley, *Stolen Valor: How the Vietnam Generation was Robbed of its Heroes and of its History*, Dallas: Verity Press, 1998
Camp, Norman M, et al, eds, *Stress, Strain and Vietnam: An Annotated Bibliography*, New York: Greenwood Press, 1988
Figley, Charles R, ed, *Mapping Trauma and its Wake: Autobiographical Essays by Pioneer Trauma Scholars*, New York: Routledge, 2006
Jones, Edgar and Simon Wessely, *From Shell Shock to PTSD: Military Psychiatry from 1900 to the Gulf War*, Hove: Psychology Press, 2005
Leys, Ruth, *Trauma: A Genealogy*, Princeton: Princeton University Press, 2000
Lifton, Robert Jay, *Home from the War: Learning from Vietnam Veterans*, 3rd ed., Boston: Beacon Press, 1992
Nicosia, Gerald, *Home to War: A History of the Vietnam Veterans' Movement*, New York: Crown, 2001
Rosen, Gerald M, ed, *Posttraumatic Stress Disorders: Issues and Controversies*, Chichester: Wiley, 2004
Scott, Wilbur, *The Politics of Readjustment: Vietnam Veterans since the War*, New York: Aldine de Gruyter, 1993
Shay, Jonathan, *Achilles in Vietnam: Combat Trauma and the Undoing of Character*, New York: Simon and Schuster, 1995
Shay, Jonathan, *Odysseus in America: Combat Trauma and the Trials of Homecoming*, New York: Scribner's, 2002
Shephard, Ben, *A War of Nerves: Soldiers and Psychiatrists in the Twentieth Century*, Cambridge, Ma: Harvard University Press, 2001
Van der Kolk, Bessel A, et al, eds, *Traumatic Stress: The Effects of Overwhelming Experience on Mind, Body, and Society*, New York: The Guilford Press, 1996
Young, Allan, *The Harmony of Illusions: Inventing Post-traumatic Stress Disorder*, Princeton: Princeton University Press, 1995

ADVANCES IN MODERN COMBAT CASUALTY CARE WITH A VISION TO THE FUTURE

William Wiesmann MD, Nicole Draghic, John Parrish MD

DePalma, RG, DG Burris, HR Champion and MJ Hodgson, "Blast Injuries", *New England Journal of Medicine*, 31 March 2005; 352 (13), pp 1335–42.
Okie, S., "Traumatic Brain Injury in the War Zone", *New England Journal of Medicine*, 19 May 2005; 352 (20), pp 2043–47
Shea, Neil, "*The Heroes, The Healing: Military Medicine from the Front Lines to the Home Front*", National Geographic Magazine, December 2006
Underwood, Anne, "War on Wounds: Why the Military is Backing the Cool New Field of Regenerative Medicine", *Newsweek*, 19 May 2008

CONTRIBUTORS' BIOGRAPHIES

KEN ARNOLD has worked in a variety of museums on both sides of the Atlantic. He joined the Wellcome Trust in 1992, after completing his PhD on the history of museums. He now heads the Trust's Public Programmes department, running events and exhibitions for Wellcome Collection. He regularly writes and lectures on museums and on contemporary relations between the arts and sciences. He also serves on a number of advisory boards and committees. His most recent book is *Cabinets for the Curious* (Ashgate, 2006).

JOANNA BOURKE is Professor of History at Birkbeck College, University of London. She has published seven books, on Irish history, gender and the body, the history of psychological thought, modern warfare, the emotions, and sexual violence. Her books have been translated into Chinese, Italian, Portuguese, Spanish, Catalan, Greek and Turkish. *An Intimate History of Killing: Face-to-Face Killing in Twentieth Century Warfare* (Granta) won the Fraenkel Prize in Contemporary History (1998) and the Wolfson History Prize (2000). *Fear: A Cultural History* was published by Virago in 2005. *Rape: A History from 1860s to the Present*, was published by Virago in 2007.

DR ANA CARDEN-COYNE is Lecturer in War/Conflict Studies at the Centre for the Cultural History of War (University of Manchester). She works on war medicine, memory and commemoration, the history of the body, disabilities, and the ethics of representation. She co-edited *Cultures of the Abdomen: A History of Diet, Digestion and Fat in the Modern World* (with Christopher E Forth, Palgrave, 2005); a special edition of European Review of History entitled 'Enabling the Past: New Perspectives in the History of Disability' (with Julie Anderson, 2007), and her monograph *Reconstructing the Body: Classicism, Modernism and the First World War* will be published by Oxford University Press, 2009. Her current project is *Men in Pain: Injury, Disability and Masculinity in the First World War*.

DAVID COTTERRELL studied at Central St Martins College of Art and Design, Winchester School of Art and Chelsea School of Art. His work has often been constructed specifically for certain environments, in response to sites as diverse as a castle in the Czech Republic to a decommissioned nuclear bunker in Hampshire. Working in many media, including photography, video, audio, interactive media, Artificial Intelligence and device control, he customises existing technologies to assert new use values. His work has been shown both nationally and internationally. Cotterrell is Professor of Fine Art at Sheffield Hallam University, and is represented by Danielle Arnaud contemporary art.

NICOLE DRAGHIC is the senior technical research analyst and technical writer supporting both research-contract activities for the USMRMC, DARPA, NASA, NIST, USSOCOM and numerous technical government support groups including the BioSTAR group, CIMIT, the Johns Hopkins Applied Physics Laboratory, Harvey Mudd College, the Oregon Medical Laser Center, Washington University and the University of Cincinnati. She has written extensively on technology development in neurotrauma, resuscitation technology and tissue engineering, and has recently co-authored the leading chapter on telemedicine in *Expedition and Wilderness Medicine* (Cambridge University Press, 2008).

WOLFGANG U ECKART studied medicine, history and philosophy at the University of Munster. Since 1992 he has been Professor of the History of Medicine at the University of Heidelberg. Previously, he was professor and director of the Department of Medical History at Hannover Medical School. From 1996 to 1998 he was President of the German Society for the History of Science. His research and teaching activities include medicine and colonial imperialism; the history of tropical medicine; nineteenth- and twentieth-century medical missions; medicine and war; and the history and ethics of medical experimentation.

KATE FORDE is a Curator of Temporary Exhibitions at the Wellcome Collection, London, and co-Curator of *War & Medicine*, at the Wellcome Collection, November 2008—February 2009. She has held posts at Arts Council England, Tate, and the Metropolitan Museum, New York.

SUSANNE HAHN has been director of the Heimerer social-care training school in Döbeln, Saxony, since 2000. Previously, she was exhibition curator at the German Hygiene Museum, Dresden. Following her training in medicine and her postgraduate studies in Internal Medicine, she also worked as a GP and a lecturer. Her academic publications and lectures have covered the history of suicidal tendencies, the care of the terminally ill, health education, medicine and war, and medicine during the National Socialist era. She has also curated major exhibitions on the heart (1995) and the brain (2000).

MARK HARRISON is Professor of the History of Medicine and Director of the Wellcome Unit for the History of Medicine at the University of Oxford. He is the author of several books and articles on disease, medicine and war, including *Medicine and Victory: British Military Medicine in the Second World War* (Oxford University Press, 2004), which won the Templer Medal Book Prize awarded by the Society for Army Historical Research.

MELISSA LARNER is co-editor, with James Peto and Nadine Monem, of *War and Medicine*. A freelance editor and writer, she was also co-editor and contributor to the Wellcome Collection's BMA award-winning *The Heart* (published with Yale University Press, 2007). She has edited numerous books, catalogues and articles on the arts and culture for Tate Publications, Phaidon Press, Riding House Editions, the Serpentine Gallery and *frieze* magazine, amongst many others.

DR JOHN A PARRISH is director of CIMIT, Center for Integration of Medicine and Innovative Technology (a Boston-based consortium of major teaching hospitals and engineering schools committed to facilitating improvements in healthcare through technology. A graduate of Duke and Yale Universities, he trained in internal medicine and dermatology. He was a battlefield doctor in Vietnam and Chair of Dermatology Department at Harvard Medical School. He has more than 300 publications to his name, including six books. He is a member of the Institute of Medicine, National Academy of Science, and the Science Advisory Board, National Space Biomedical Institute.

JAMES PETO is Senior Curator of Public Programmes at the Wellcome Trust and one of the curators of the exhibition *War and Medicine* at Wellcome Collection, November 2008—February 2009, as well as co-editor of this book. Previously he was Exhibitions Curator at the Whitechapel Art Gallery and Head of Exhibitions at the Design Museum, London.

COLLEEN M SCHMITZ is Curator and Head of the Exhibition and Registrar's Office at the Deutsches Hygiene-Museum in Dresden. She is also the project leader from the Hygiene-Museum for the collaboration with Wellcome Collection on the exhibition *War & Medicine*, November 2008—February 2009 (London) and April—August 2009 (Dresden).

LUCY SHANAHAN is a Curator of Temporary Exhibitions at the Wellcome Collection and co-Curator of *War & Medicine*, November 2008—February 2009. She was previously Exhibitions Organiser at the Institute of Contemporary Arts, London.

BEN SHEPHARD is the author of *A War of Nerves: Soldiers and Psychiatrists in the Twentieth Century* (Harvard UP, 2001) and *After Daybreak: The Liberation of Belsen* (Jonathan Cape, 2005). After reading history at Oxford, he was a producer on the BBC's *The World at War* series and then spent two decades making documentaries about history and science. He has held visiting-research fellowships at Yale and New York Universities, gave the Lees Knowles Lectures on military history in 2006, and is currently a Visiting Research fellow in the Leverhulme Changing Character of War programme in Oxford. He is preparing a book on refugees after the Second World War.

HUGH SMALL is a former management consultant who has written books on Florence Nightingale and the Crimean War, and frequently lectures and broadcasts on both subjects. His study of Florence Nightingale included important new research into her analysis of wartime mortality and the development of her interest in public health. His parents were both doctors and he grew up in a house in Harley Street opposite the site of Florence Nightingale's hospital.

KLAUS VOGEL is Director of the Deutsches Hygiene-Museum, Dresden. Having studied Cultural Sciences and Educational Sciences he worked in management. He has been at the Deutsches Hygiene-Museum since 1991, firstly as the Head of Exhibitions and, since 2000, as Director. Since 2007 he has been Honorary Professor at the School of Fine Arts in Dresden.

DR WILLIAM P WIESMANN has dedicated his career to the research and development of innovations to improve medical care in trauma, military and emergency medicine. He served as a medical researcher for the US Army at the Walter Reed Army Institute of Research, rising to research director for combat-casualty care at the US Army Medical Research and Matériel Command. He is founder, president and CEO of the BioSTAR Group, a collective of companies specialising in lifesaving advances in equipment and technologies.

INDEX

COLOPHON

Black Dog Publishing Limited
10A Acton Street
London WC1X 9NG
info@blackdogonline.com

Co-editors Melissa Larner, James Peto and Nadine Monem
Researchers Nikolaus Kotsopolous and Julius Pasteiner

Designed by Emily Chicken at Black Dog Publishing
with thanks to Ana Estrougo

British Library Cataloguing-in-Publication Data.
A CIP record for this book is available from the British Library

ISBN 978 1 906155 520

Black Dog Publishing Limited, London, UK,
is an environmentally responsible company.

War and Medicine is set in Bodoni, Helvetica, Humanist 521 and Zapfino
and is printed on xxxxxxxxxxxxxxxxx, an FSC certified paper.