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Weapons, Injuries and Casualty Care during the Anglo-Boer War, 1899-1902

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Abstract

The specialty of front-line medicine has evolved over many years and conflicts. This review aims to compare the effectiveness of casualty and immediate trauma care of soldiers on both sides of the Anglo-Boer War (1899-1902). The conflict highlighted many shortcomings in the medical systems of both armies. A change in small arms design, which resulted in unique injuries, as well as the mode of warfare of the Boer forces presented novel challenges for the British. The Boers lacked medical teams and resources to treat their battle wounded. Both sides also suffered from sub-optimally trained and equipped staff. The official ambulance service of the Boers was formed entirely of untrained civilian volunteers, with aspects of the British system encountering the same issue, particularly with front-line stretcher bearers. The aim here is to examine the nature of the injuries caused by the Mauser and Lee Enfield rifles and to compare the casualty care and health challenges faced by both forces.

Keywords

Anglo-Boer War, Injuries, Casualty care, Field hospital, Military medicine

Introduction

The Anglo-Boer War (1899-1902) came as a result of rising tensions between the British and the Boer Republics. On 11 October 1899, the President of the Transvaal republic, Stephanus Johannes Paulus Kruger (1825-1904), declared war on the British.[1] In Britain,

[1] Pakenham T. *The Boer War*. London: Futura; 1982. xv.

it was nicknamed 'the teatime war' and was widely anticipated to be concluded by Christmas but waged on for 32 months.[2] In run-up events, Britain granted independence to the two Boer Republics of the Orange Free State and the Transvaal by 1854.[3] Tensions grew between President Kruger and the British South Africa Company's drive to exploit the newly discovered mineral wealth in the Transvaal. The company was founded by Cecil John Rhodes (1853-1902) in 1889 and the discovery of gold at Witwatersrand Reef in the Transvaal resulted in over 75,000 British migrants flocking to the region.[4] The struggle for control over this lucrative natural resource invigorated the century-old conflict between Boers and Britain.[5]

After being elected Prime Minister of the Cape in 1890, Rhodes deployed a section of his private army led by Leander Starr Jameson (1853-1917) in the town of Mafeking to dissuade the Boers from making the invasion they had threatened.[6] The pair planned for an uprising to take place on 28 December 1895 with the aim of overthrowing an unpopular President Kruger and taking British control of the region.[7] Although it had been postponed, Jameson's attack took place on 29 December.[8] Rhodes, intentionally or not, had failed to call off the attack and Jameson's 600 troops were easily defeated by the Boers, and the botched raid became known as the Jameson Raid.[9]

Growing hostilities were making war ever more likely with the British keen to ensure they were not seen as the instigator of any conflict.[10] Following a breakdown of talks between the two governments in Bloemfontein in May 1899, an ultimatum was issued by Kruger on 9 October in which he laid out demands to be met within 48 hours.[11] Inevitably, his wishes were not met and war broke out two days later.[12]

This review aims to compare the effectiveness of casualty and immediate trauma care of the British and Boer forces. The following sections will examine the nature of the injuries caused by the Mauser and Lee Enfield rifles and the casualty care and health challenges faced by both forces during the Anglo-Boer War.

Weapons and injuries

In many ways the Anglo-Boer War signified the inception of a new way of thinking about military medicine. The preceding Crimean War (1853-56) highlighted serious

[2] Cirillo VJ. Arthur Conan Doyle (1859–1930): Physician during the typhoid epidemic in the Anglo-Boer War (1899–1902). *Journal of Medical Biography*. 2013; 22(1): 2-8.
[3] Lee ECG. *To the Bitter End: A Photographic History of the Boer War, 1899-1902*. Middlesex, England: Viking; 1985. p.22.
[4] Lee. *To the Bitter End*, 1985 (Note 3). p.21.
[5] Bro T. Josef Hammar (1868–1927) – a Swedish physician in the Anglo-Boer War (1899–1902). *Journal of Medical Biography*. 2016; 24(2): 191-196.
[6] Van Hartesveldt FR. *The Boer War*. Stroud: Sutton Publishing; 2000. p.7.
[7] Williams B. *Cecil Rhodes*. London: Constable; 1921. p.263.
[8] Williams. *Cecil Rhodes,* 1921 (Note 7). p.269.
[9] Williams. *Cecil Rhodes*, 1921 (Note 7). p.266.
[10] Pakenham. *The Boer War*, 1982 (Note 1). p.31.
[11] Pakenham. *The Boer War*, 1982 (Note 1). p.103.
[12] Pakenham. *The Boer War*, 1982 (Note 1). p.108.

shortcomings in the care of soldiers who were dying of diseases including cholera and dysentery due to simple ignorance about sanitation. Furthermore, a lack of staff and equipment resulted in patients lying on the floor without access to necessary treatments.[13] A Royal Commission was subsequently established in 1857 to conduct extensive research towards the improvement of sanitation and led to the formation of the Army Medical School at Fort Pitt Hospital, between Chatham and Rochester, in 1860.[14]

The formation of the Royal Army Medical Corps (RAMC) followed in 1898 – after incorporating the Army Medical Staff into the Medical Staff Corps – and gave doctors a rank equal to their infantry counterparts, allowing medical advice to be considered in strategic planning.[15] However, fractious relations between medical and combatant officers meant that opinions were largely ignored.[16] The inadequacies of the newly formed RAMC would soon become evident and the Corps urgently called upon the voluntary work of civilian surgeons and physicians.[17]

In the run up to the war, changes were seen in the type of bullets adopted by modern armies. The soft lead ball of around 0.72- to 0.75-inch calibre (with respective muzzle velocities of 213 to 244 m/s), used in the musket, fell out of favour and in its place came a smaller, faster travelling, cylindrical, hard-coated projectile.[18] In place of the musket, the British used the 0.303-inch calibre Lee Metford Mark II and Lee Enfield rifles (muzzle velocity of around 610 m/s) Rifle barrels had spiral internal grooves which imparted spin and stability to bullets, significantly increasing their range and accuracy. The Boers used the 0.275-inch calibre Spanish version of the Mauser rifle (muzzle velocity of around 700 m/s).[19]

Kruger anticipated war and subsequently equipped his forces with 37,000 Mauser rifles and a complement of 50 million rounds of ammunition.[20] Given the equation Energy = Mass × Velocity (squared), abbreviated $E=MV^2$, it is clear to see how the increased velocity of new bullets outweighed the reduction in mass to produce a resultant increase in energy. The extensive work of Colonel Louis Anatole La Garde (1849-1920) of the United States Army Medical Corps noted that this increase in energy was 1.22 times that of earlier bullets.[21]

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[13] Wrench EM. The lessons of the Crimean War. *The British Medical Journal*. 1899; 2(2012): 205-208.
[14] Bowen M, Whiston B, Cooper M. Britain's forgotten military medical school at Fort Pitt, Kent (1860–1863). *Journal of Medical Biography*. 2022; 30(4): 261-269.
[15] Miles AEW. *The Accidental Birth of Military Medicine*. London: Civic Books; 2009. p.14.
[16] Harrison M. *Medicine and Victory: British Military Medicine in the Second World War*. Oxford: Oxford University Press; 2008. p.8.
[17] Blair JS. Sir Frederick Treves. *Journal of the Royal Army Medical Corps*. 2008; 154(1): 74-75.
[18] Stevenson WF. *Wounds in War: The Mechanism of Their Production and Their Treatment,* Second Edition. London: Longmans, Green and Co; 1904. p.32-33.
[19] Stevenson. *Wounds in War*, 1904 (Note 18). p.44.
[20] Jones D. *Gallant Little Wales. The Welsh Hospital Service in Adversity During the Boer War*. Talybont, Ceredigion: Y Lolfa; 2023. p.13.
[21] La Garde LA. *Gunshot Injuries: How They Are Inflicted, Their Complications and Treatment*. New York: Wood; 1914. p.8.

Before its use in combat, concerns existed over the ability of the new bullet to render a soldier *hors de combat*. The expectation was that the wounds inflicted by such a bullet would be so minor that the soldier would be able to re-join the line in a matter of days or even continue fighting regardless of being hit.[22] La Garde claims that these beliefs were proved false in the Spanish-American War of 1898.[23] The Mauser bullets caused havoc and some of the wounded had been shot more than once.

Sir Frederick Treves (1853-1923), a civilian and well known surgeon, vividly described the challenges of battlefield surgery during his attachment to No. 4 Stationary Field Hospital.[24] It is important to note that the hospital was not stationary at all and moved with the column's advance on the battlefield.[25] Treves wrote that the hospital was well equipped and well supplied but would later highlight that some of the instruments were dated.[26] Treves's book, *A Tale of a Field Hospital*, provides insights to the nature of the bullet wounds which ranged from limb involvement to head wounds: 'Here was a man nursing a shattered arm … while near by a poor fellow, who had been shot through the lung, was coughing up blood …'. [27]

Reports of the time indicated that the majority of injuries seen from the Boer Mauser were to the upper limb, a point enforced by General Theodore Edward Stephenson (1856–1928) who reported that 60 per cent of wounds were to the extremities, with eight per cent to the abdomen.[28] The large proportion of traumatic injuries seen in this war would thus involve the long bones and major vessels of the arms and legs.

Prior knowledge did not exist regarding the effects of small calibre weapons and much research was conducted before these conflicts in the late nineteenth century in an attempt to prepare surgeons for the injuries they would be presented with. Teams in America, France and Germany all performed ballistic research on cadavers to recreate the effects of the bullet, but the usefulness of these experiments was challenged.[29] Surgeon-Colonel William Flack Stevenson (1844-1922) was one critic who noted that solidifying fats and contracted muscles contribute to an increase in resistance, exaggerating any destructive effect.[30] Observations made in subsequent wars portray that this may indeed be the case where little explosive effect was seen when the bullet passed through soft viscera such as the liver, kidney and lung.[31]

However, the surgeons of the time agreed upon the effect the novel bullet of the Anglo-Boer War had on blood vessels, an important point given the prevalence of injuries to the limbs. It was concluded that blood vessels were less able to slip around the new high velocity projectile compared to the larger, slower ball it had replaced. This

[22] Stevenson. *Wounds in War,* 1904 (Note 18). p.37-38.
[23] La Garde. *Gunshot Injuries*, 1914 (Note 21). p.41-51.
[24] Treves F. *A Tale of a Field Hospital*. London: Cassell; 1900. p.1.
[25] Treves. *A Tale of a Field Hospital*, 1900 (Note 24). p.1.
[26] Blair. Sir Frederick Treves, 2008 (Note 17).
[27] Treves. *A Tale of a Field Hospital*, 1900 (Note 24). p.15-16.
[28] Anon. *Daily Mail and Empire*, Milner Sees Wounded: Boer Bullets Cause Extraordinary Injuries, 9 November 1899; Parker J. Surgical Experiences from the Boer War. *Journal of the Royal Army Medical Corps*. 2002; 148(1): 89-95.
[29] La Garde. *Gunshot Injuries*, 1914 (Note 21). p.41.
[30] Stevenson. *Wounds in War,* 1904 (Note 18). p.44-48.
[31] Stevenson. *Wounds in War,* 1904 (Note 18). p.49.

increased the likelihood of damage to vessels, making haemorrhage, aneurysm and paralysis from nerve damage more likely.[32] [33] Injuries to bone tissue were well understood. Subsequent experimental data carried out on firing ranges report that the explosive effects on bone were broadly the same for both large and small calibre bullets up to 320 metres, but that the amount of fragmentation produced by the small calibre bullet was reduced after this point. Fracturing was also more likely to occur on the more resistant compact bone of the diaphysis, compared to the cancellous bone in the epiphysis; here bullets regularly perforated the bone with limited fracturing, as seen in Figure 1.[34]

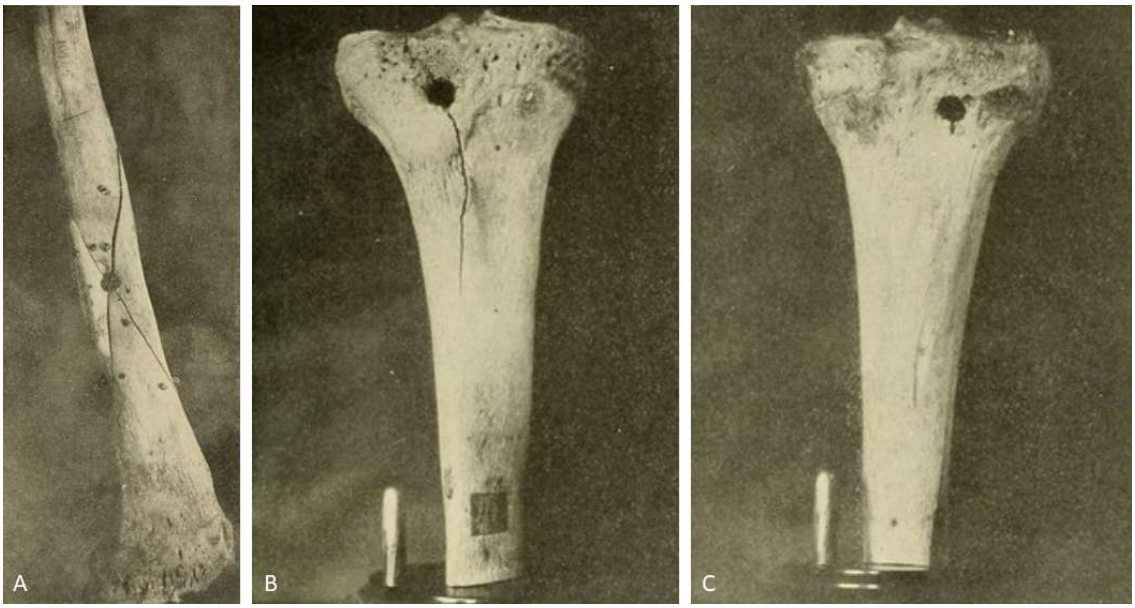

Figure 1. Bone fracturing. A butterfly fracture of the compact bone (A) of the tibia (lateral view) caused by a Mauser bullet in a cadaveric specimen. The entry (B) and exit (C) trajectory of a .303 calibre through the proximal tibia as viewed from anterior (B) and posterior (C). Limited fracturing can be seen in cancellous bone (B and C) compared to compact bone (A). From: La Garde. *Gunshot Injuries,* 1914 (Note 21). p.46-47. Wellcome Collection. Public Domain Mark.

The introduction of antiseptic surgery favoured the prognosis of these injuries. The outcome of more complex joint injuries, known for their high mortality rates before the Anglo-Boer War, became more favourable. Reports indicate that gunshot wounds of joints were not fatal and there were only a few amputations.[35]

[32] Stevenson WF. Notes on surgical experiences of the Boer war. 1903. *Journal of the Royal Army Medical Corps*. 2002; 148(1): 91-95.
[33] Anon. The report on the surgery of the Boer War. *British Medical Journal*. 1905; 2(2341): 1301-1302.
[34] La Garde. *Gunshot Injuries,* 1914 (Note 21). p.46-47.
[35] Anon. The report on the surgery, 1905 (Note 33).

British casualty evacuation and field hospitals

First on the scene of a battlefield injury was the team of sixteen regimental stretcher bearers.[36] These teams were employed to transport a wounded soldier back to the Regimental Aid Post, where a medical officer and two orderlies were located.[37] From here, the bearer company would evacuate to field hospitals and hospital trains would transport the more severely injured to general hospitals located further back.[38] Each brigade was supported by a bearer company, in theory supplied with ten ambulance wagons staffed by 61 men, but on regular occasions this proved not to be the case.[39] On such occasions, bearer companies were given just two wagons and half the number of staff they were entitled to.[40]

The major problem with the system employed by the British was that the evacuation chain was split and acted as separate autonomous groups. The result of this was that the roles of the field hospital and bearer companies were blurred causing friction and an uneven distribution of work, with the bearer company often underused.[41] Lieutenant-Colonel Arthur Bowdich Cottell (1856-1932), surgeon to the RAMC, also explains that because the regimental stretcher bearers marched with arms alongside the rest of the regiment they were not subject to any protection from the Geneva Convention and as such were subject to the same risks as any other combatant.[42]

It is also appropriate to mention the issue of training. It was a recognised problem that a large portion of the bearer company was not professional soldiers, nor medically trained. The effect of this was that they possessed little appreciation for their job and, along with their non-commissioned officers, lacked expertise in many areas of casualty care and transportation, a problem exacerbated by the inadequate training they received.[43]

In terms of the equipment supplied to bearer companies and stretcher bearers, complaints mainly surrounded ambulance wagons. Stretchers were broadly considered adequate, if a little heavy.[44] Many different ambulance wagons were used throughout the war and all suffered from defects in some way. For instance, the Mark 5 was strong

[36] Carter GB. Ambulance Work in Hill Warfare from Front to Base. *Journal of the Royal Army Medical Corps*. 1905; 5(4): 509-516.
[37] Gubbins WL. Field Medical Organisation – The Lessons of the War. *Journal of the Royal Army Medical Corps*. 1904; 2(4): 446-458.
[38] Bricknell M. The Evolution of Casualty Evacuation in the British Army 20th Century (Part 1) – Boer War to 1918. *Journal of the Royal Army Medical Corps*. 2002; 148(2): 200-207.
[39] Royal Commission on South African Hospitals. *Report of the Royal Commission appointed to consider and report upon the care and treatment of the sick and wounded during the South African campaign: presented to both houses of Parliament by command of Her Majesty*. London: HMSO; 1901. p.5.
[40] Fremantle FE. *Impressions of a Doctor in Khaki*. London: J. Murray; 1901. p.309.
[41] Bricknell. The Evolution of Casualty Evacuation, 2002 (Note 38).
[42] Cottel R. The Medical Services in the First Line. *Journal of the Royal Army Medical Corps*. 1903; 1(4): 292-305.
[43] Julian ORA. No. 2. – Duties of R.A.M.C. in the Field. *Journal of the Royal Army Medical Corps*. 1912; 18(5): 588-594.
[44] Jones TP. A Report upon the Transport of the Sick and Wounded in the Field. *Journal of the Royal Army Medical Corps*. 1904: 3(6); 577-594.

but lacked any storage for water and medical supplies, while the Mark 3 had only a small capacity for patients, especially when lying down. The Tonga was a two wheeled wagon brought over by Indian teams and although well designed, their small capacity made them inadequate for employment in sick convoys.[45]

The field hospitals were equipped to perform tasks ranging from the thorough cleaning and dressing of battlefield wounds to amputation and urgent surgery on head wounds. The removal of foreign bodies such as shell fragments was left to general hospitals, to be guided by X-rays.[46] Injuries caused by shell fragments were comparatively uncommon due to the nature of the landscape and resulting dispersal of the soldiers.[47] The typical arrangement of a field hospital is depicted in Figure 2.

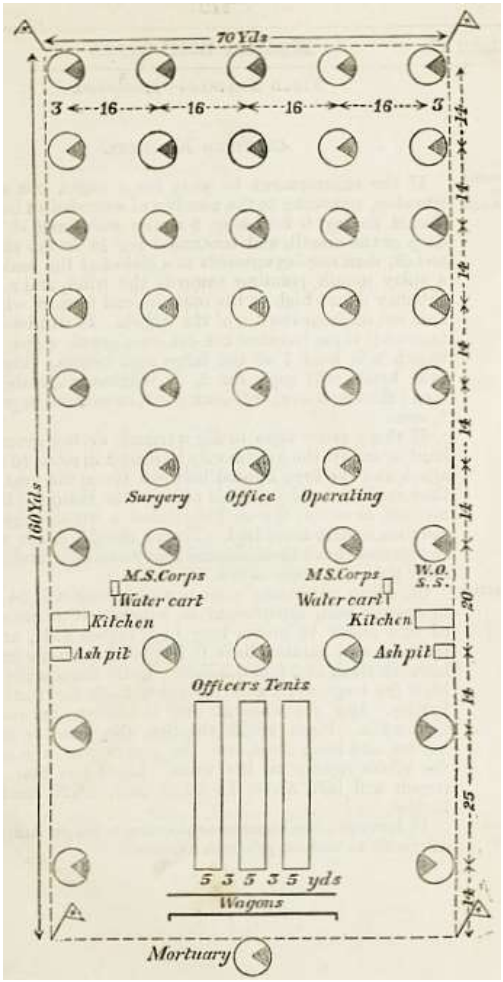

Figure 2. Arrangement of a British field hospital. War Office. *Manual,* 1894 (Note 48). Wellcome Collection. Attribution NonCommercial 4.0 International (CC-BY-NC 4.0).

[45] Jones A. Report upon the Transport*,* 1904 (Note 44).

[46] Fettes D. Fifty Years of Surgery in the Royal Army Medical Corps. *Journal of the Royal Army Medical Corps*. 1948; 90(6): 271-281.

[47] Flockemann A, Ringel T, Wieting J. *Kriegserfahrungen der zweiten deutschen (hamburgischen) Ambulanz der Vereine vom Rothen Kreuz aus dem südafrikanischen Kriege.* Leipzig: Breitkopf und Härtel; 1901. p.1-68.

Each field hospital was supplied with Mark III/IV bell tents both for the housing of patients and for use as operating theatres.[48] Bell tents used for wards were arranged in a 5×5 configuration. Each tent could weigh up to 44½ lbs (around 20 kg) and there were tents for a kitchen, operating theatre, general surgery and an officers' mess. The field hospital, along with all the equipment (including beds, mattresses and linen), moved with the advancing column of troops and was not a stationary hospital.[49]

Lieutenant-Colonel George Harrison Younge (dates unknown), commander of No. 15 Field Hospital, explains how quickly the hospital can become operational, perfectly summarising the demands on a field hospital to provide rapid, life-saving care as can be seen from the following excerpt:

> About 11am I saw a long line of ambulances approaching naval hill. I hurried down and started every man unloading equipment and pitching tents. By 3pm we had 314 gunshot wounds in the hospital.[50]

Staffing of the field hospitals posed similar problems as were described for the bearer companies. Firstly, orderlies received inadequate training and knew very little about the routine care of the sick and wounded. As a result of this, knowledge on sanitation, quarantine and disinfectant was poor or non-existent, an important factor in the epidemic of enteric fever, specifically typhoid fever.[51]

Typhoid fever

Typhoid fever, an acute infectious disease caused by *Salmonella typhi*, is spread by the faecal-oral route through contaminated food or water and occasionally through direct contact. Typhoid was a major public health concern during the nineteenth century in Europe and England.[52] Infectious diseases once again proved to be a formidable adversary and ten per cent (57,684) of the British forces involved in the Anglo-Boer War contracted typhoid and the disease killed 8,225 combatants, more than the 7,582 who died in action.[53] Close quarters of the British troops and the misleading yet similar

[48] War Office. *Manual for the Medical Staff Corps.* London: HMSO; 1894. p.177-172.
[49] Younge GH. Diary of a Field Hospital During the South African War. *Journal of the Royal Army Medical Corps*. 1927; 49(5): 374-384; Treves, *A Tale of a Field Hospital*, 1900 (Note 24), p.1-2.
[50] Younge. Diary of a Field Hospital, 1927 (Note 49).
[51] Ogston A. The Medical Arrangements in The South African War. Evidence of Civilian Surgeons. *The British Medical Journal*. 1903; 2(2232): 930-934.
[52] Aldridge AR. The Prevention of Enteric Fever in India. *Journal of the Royal Army Medical Corps*. 1909; 13: 221-232; Hardy A. *The Epidemic Streets: Infectious Disease and the Rise of Preventive Medicine, 1856-1900*. Oxford: Clarendon Press, Oxford; 1993.
[53] Simpson RJS. Medical history of the South African War. Part IX. *Journal of the Royal Army Medical Corps*. 1910; 15: 257-275.

symptoms of paratyphoid, which in severe cases mimics typhoid proper, made matters worse.[54]

The voluntary antityphoid inoculation campaign of Sir Almroth Edward Wright (1861-1947) did not offer the protection it promised due to poor storage conditions of the vaccines and the data were considered unreliable due to improper record keeping.[55] Wright was a bacteriologist who developed the vaccine and his findings had suggested that 'in every case, there was at least a two-fold reduction in cases of typhoid fever in the inoculated'.[56] Wright's vaccine would only be appreciated during the First World War.[57]

It has been suggested that the Boer forces were less affected by typhoid. It is believed that their small numbers, natural immunity due to prior exposure, their years of isolation in a rural setting and constant movement of the Boer Commandos counted in their favour.[58] The large slow-moving army of the British forces and subsequent higher risk of exposure to typhoid were in contrast to the Boer forces.[59] However, Jacquez Charl (Kay) de Villiers (1928-2018), former neurosurgeon and celebrated author on the medical history of the Anglo-Boer War, noted that typhoid fever proved problematic for the Boers during the Battle of Paardeberg near Kimberly.[60] The impact of typhoid and infectious diseases has been captured in the seminal two-volume work of de Villiers in Chapter 8 of the second volume.[61]

Public education was a vital preventive measure and Sir Alexander Ogston (1844-1929) at the time believed orderlies should receive the standard of training in infection control, transport and care of the wounded as seen in the German Army.[62] It was also recognised that the skills of military surgeons were far behind their civilian counterparts who were drafted in to account for shortfalls in RAMC staff. It was acknowledged by the official inquiry that the duties of an RAMC doctor were extended beyond the simple care of patients and as a result the quality of their clinical work was lacking, purely through limited practice. It was subsequently recommended that military surgeons should be employed in the care of civilians, similar to the Russian set-up during the Crimean War.[63] This report also found that in order to address the friction between the

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[54] McNaught JG. Paratyphoid Fevers in South Africa. *Journal of the Royal Army Medical Corps*. 1911; 16: 505-514; de Villiers JC. The medical aspect of the Anglo-Boer War, 1899-1902: Part I. *Military History Journal (The Official Journal of the South African Military History Society)*. 1984; 6(2): 1-5. http://samilitaryhistory.org/journal.html

[55] Hardy A. "Straight Back to Barbarism": Antityphoid Inoculation and the Great War, 1914. *Bulletin of the History of Medicine*. 2000; 74: 265-290.

[56] Patrick A. *The Enteric Fevers (1800-1920)*. Edinburgh: Edinburgh, Royal College of Physicians; 1955. p.1-46.

[57] Hardy. "Straight Back to Barbarism", 2000 (Note 55).

[58] Simpson. Medical history, 1910 (Note 53); de Villiers JC. The medical aspect of the Anglo-Boer War, 1899-1902: Part II. *Military History Journal*. 1984; 6(3): 1-5.

[59] Jones. *Gallant Little Wales*, 2023 (Note 20). p.34.

[60] de Villiers. The medical aspect, Part II, 1984 (Note 58).

[61] de Villiers JC. *Healers, Helpers and Hospitals: A History of Military Medicine in the Anglo-Boer War, Volumes I and Volume II.* Pretoria: Protea Book House; 2008.

[62] Ogston. The Medical Arrangements, 1903 (Note 51).

[63] Ogston. The Medical Arrangements, 1903 (Note 51); Royal Commission. *Report,* 1901 (Note 39). p.12.

field hospital and bearer company, the two should be amalgamated into the field ambulance, working under the same command to ensure a co-ordinated evacuation.[64] Not only were medical staff found to be undertrained, there were also simply not enough of them.

Specific inadequacies were identified in the provision of personnel and equipment with bell tents, which would leak water in heavy rain, being used to sleep up to seven patients instead of the four they were intended for.[65] The result was that hospitals contained four times as many patients as they could safely hold, with large numbers lying on blankets spread on the ground.[66] In Bloemfontein, the 12th Brigade Field Hospital had just three surgeons and 48 orderlies to care for 320 patients.[67] The same issue was identified in the nursing staff despite the ample number of trained and willing nurses back in the UK.[68] Resulting backups meant that Field Hospitals could not evacuate their patients for up to five weeks.[69] The issue of overcrowding was less acute in private hospitals which were extremely well equipped but would only take the most serious cases into their camps.[70]

Boer Medical Services

Despite the shortcomings of the British medical services in this war, their systems were vastly more sophisticated than those supplied to the Boer soldiers. Officially, no military medical service existed in the Boer Republics until 1896.[71] Following the botched Jameson Raid (29 December 1895-2 January 1896) a group of doctors advised President Kruger to create an ambulance unit made up of 100 volunteers and award it £500 for medical equipment.[72] Their proposal was granted in 1896 and named the Pretoria Ambulance Corps; this later became 'Het Transvaalsche Roode Kruis' (The Transvaal Red Cross) after the Transvaal's endorsement of the Geneva Convention.[73] Aside from this, little other action was taken by the Boer Government despite the increasing prospects of war. In 1899 the Transvaal Red Cross recruited more volunteers and new divisions of the unit were formed in larger towns.[74] Large numbers of people offered their service to the volunteer ambulance, raising suspicion that people merely wished to

[64] Bricknell. The Evolution of Casualty Evacuation, 1918 (Note 38); Royal Commission. *Report*, 1901 (Note 39). p.70.
[65] Royal Commission. *Report,* 1901 (Note 39). p.30-31; Ogston. The Medical Arrangements, 1903 (Note 51).
[66] Fremantle. *Impressions of a Doctor,* 1901 (Note 40). p.354.
[67] Royal Commission. *Report,* 1901 (Note 39), p.30.
[68] Fremantle. *Impressions of a Doctor,* 1901 (Note 40). p.72.
[69] Fremantle. *Impressions of a Doctor,* 1901 (Note 40). p.259.
[70] Royal Commission. *Report,* 1901 (Note 39). p.15.
[71] Stratford DO. Military Medical Services During the Old Transvaal Republic. *Military History Journal*. 1967; 1(1): 1.
[72] Stratford. Military Medical Services, 1967 (Note 71); de Villiers. The medical aspect, Part I, 1984 (Note 54).
[73] Stratford. Military Medical Services, 1967 (Note 71); de Villiers. The medical aspect, Part I, 1984 (Note 54).
[74] de Villiers. The medical aspect, Part I, 1984 (Note 54).

avoid military service. Furthermore, almost all of these volunteers were completely untrained and as a result the reputation of the service suffered and many opted for treatment from their comrades.[75]

Although any official data regarding the number of persons involved in the Boer medical unit is unknown, it is thought to be well under 1,000, clearly insufficient to support the 50,000 combatants that made up its army.[76] No data exists on the number of field hospitals that were operational at the time due to a lack of official record keeping, the poor coordination of foreign voluntary aid and the presence of quack practitioners.[77] Many doctors set up private ambulances, but the lack of command meant that organisation was non-existent and much friction occurred between units.[78]

Holes in Boer medical care were filled further by The Red Cross and fourteen foreign-funded ambulance units, including the Belgian-German and Scandinavian ambulances, reflecting the strong public feeling of sympathy for the Boers.[79] Josef Hammar (1868-1927), a Swedish doctor who served with the Utrecht command, tells of the poor organisation and how he wrote to the Swedish Red Cross in an attempt to be supplied with more bandages. The Dutch, along with the Germans, provided extensive medical aid to the Boer army, setting up hospitals complete with X-ray facilities in Pretoria.[80] It was also true that many captive Boer soldiers ended up receiving care from the advancing British, with the RAMC under orders from Cape Town to treat them 'luxuriously':

> They are given the very choicest diet, and every conceivable extra that the hospital can produce, with free tobacco and cigars, fruit, flowers, basket chairs, cushions and newspapers of all opinions. In fact they, our prisoners, get a considerably better time of it than our own soldiers and N.C.O.'s who have bled for the right cause.[81]

Insight to the lack of proper care on the Boer side is illustrated in a report from one of the Scandinavian ambulance nurses: 'The wounds were atrocious because there were men who had unbandaged wounds of a fortnight old'.[82] Not all the foreign aid to the Boer forces was so well received, however. Offers of help from a group of South African medical students led by Sir James Sivewright (1848-1916) was declined by the Boers after they were suspected to be spies or traitors. Furthermore, the lack of medical schools

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[75] Van Zyl A. Die militêre geneeskunde gedurende die vroeë jare. *Scientia Militaria: South African Journal of Military Studies*. 1976; 6(4): 1-14; van Jaarsveldt AE. Die stigting van mediese korpse in Suid-Afrika voor 1912. In: van Jaarsveldt AE (ed). *Militêre Geneeskunde in Suid-Afrika (1913-1983).* Pretoria: Military Information Bureau, SADF, Pretoria; 1983. p.7-11.
[76] Stratford. Military Medical Services, 1967 (Note 71); Bro, Josef Hammar, 2016 (Note 5).
[77] Groenewald M. Die veldhospitale van die Republikeinse magte tydens die Anglo-Boereoorlog 1899-1902. *Koers*. 1996; 61(3): 363-385.
[78] de Villiers. The medical aspect, Part I, 1984 (Note 54).
[79] van Jaarsveldt. Die stigting, 1983 (Note 75); Bro. Josef Hammar, 2016 (Note 5).
[80] van Jaarsveldt. Die stigting, 1983 (Note 75); Bro. Josef Hammar, 2016 (Note 5).
[81] Fremantle. *Impressions of a Doctor*, 1901 (Note 40). p.56.
[82] Jong CD. Die verslag van suster Elin Lindblom oor die Skandinawiese ambulans in die Tweede Anglo-Boere-oorlog. *Military History Journal*. 1979; 4(5): 1.

present in South Africa led to a general air of scepticism towards western medicine that made many reluctant to receive care from foreign ambulances.[83]

Many Boers were self-reliant and turned to their own folk medicine ('Boererate' in Afrikaans) and home nursing: 'Many of the wounded had covered their wounds with a kind of leaf which grew on the river banks'.[84] Boer remedies or folk medicine was a form of herbalism that was adopted before the 1800s and was rooted in the European, mainly Dutch, medical methods of the time. The Boers living in the rural fringes of the Cape colony were self-reliant and removed from any form of formal medical treatment. Their adaptations of known European herbal remedies were bound to flourish under these circumstances.[85] Of anecdotal interest and related to the nurse's account mentioned above is President Kruger's personal account of the use of herbalism for the treatment of a wound he sustained after a hunting accident. His autobiography captured the details of the remedy he employed:

> … the wound healed very slowly … gangrene set in … black marks rose as far as the shoulder. Then they killed a goat took out the stomach, and cut it open. I put my hand into it while it was still warm. This Boer remedy succeeded.[86]

Kruger commented that goats grazed on a river bank where many herbs grew and this was probably the reason why the remedy worked.[87] These remedies were considered to be primitive and reminiscent of the dark ages according to Sir Kendal Matthew Franks (1851-1920), honorary consulting surgeon and attached to the staff of Lord Roberts (1832-1914). Kendal was tasked with the inspection of all the concentration camps at the request of Lord Kitchener. The concentration camps were initially established as refugee camps but later transitioned into internment camps.[88] Wounds were typically treated with urine or fresh animal excrement (especially that of a goat or cow).[89]

In contrast to the Boer's seemingly archaic and improvised medicine, the RAMC surgeon of the time was rationed with surgical instruments, drugs and other medical supplies. In addition, surgeons typically carried the 1897 copy of Stevenson's *Wounds in War*.[90] However, this edition of the book became dated with the introduction of X-ray imaging that allowed the visualisation and surgical removal of bullets.[91] The Dutch, German and Russian military physicians and surgeons possessed ample experience in military medicine compared to the military and civilian counterparts whom they

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[83] Bro. Josef Hammar, 2016 (Note 5).
[84] Jong. Die verslag, 1979 (Note 82).
[85] Burrows EH. *A History of Medicine in South Africa up to the End of the Ninteenth Century*. Cape Town: AA Balkema; 1958. p.67.
[86] Kruger P. *The memoirs of Paul Kruger*. Fisher Unwin: London; 1902. p.36-37.
[87] Kruger. *The memoirs,* 1902 (Note 86).
[88] Gomme AB, Peacock E. Boer Folk-Medicine and Some Parallels. II. *Folklore*. 1902; 13(2): 181-183.
[89] Stevenson. *Wounds in War,* 1904 (Note 18). p.69-75.
[90] Stevenson. *Wounds in War,* 1904 (Note 18). p.32-48.
[91] Benton EG. British surgery in the South African War: The work of Major Frederick Porter. *Medical History*. 1977; 21(3): 275-290.

served.[92] Regardless, the medical resources of the British forces were vastly superior compared to the inadequacies faced by the Boers.

Towards the end of the war, Boer tactics changed to those of guerrilla warfare making traditional ambulance services impractical and broadly resulting in their extinction. The fall of Pretoria and Bloemfontein in 1900 resulted in the collapse of The Transvaal Red Cross and, by April 1901, all Dutch ambulances had left South Africa, leaving the Boers almost entirely without organised medical care.[93]

Following the conclusion of the war, Boer states had no formal military medical service until the formation of the Transvaal Medical Staff Corps in 1903. This would later merge with units from the Cape and Natal, after the establishment of the Union of South Africa in 1910, to form the South African Military Health Service, an organisation based on the RAMC.[94]

Conclusion

Reports from recent British involvement in Afghanistan show that since Camp Bastion's birth in 2006, over 14,000 British casualties were treated in its hospital until its closure in 2014.[95] [96] Government data further reveal that during the thirteen-year conflict just 453 British soldiers lost their lives, confirming the progress made in the care of military personnel since the Anglo-Boer War where there were over 22,000 British fatalities in under three years, the majority from communicable disease.[97] Medical imaging became vital in the care of trauma patients and nearly 90,000 plain X-ray and CT (Computerized Tomography) scans were taken throughout the life of Camp Bastion.[98] Contrast this to the newly developed radiography, or skiagraphy, that signified the forefront of medical technology at the time of the Anglo-Boer War.[99]

The Anglo-Boer War introduced two novel variables to warfare; new weaponry and the guerrilla warfare tactics of the Boer forces.[100] Modern warfare and military medicine saw many advances over the years. Comparisons can be drawn between primitive bearer companies supplied with horse and cart and the helicopter equipped Medical Emergency Response Team (MERT) deployed in Afghanistan.[101] Staff employed in the MERT were highly trained medical professionals and used a fully equipped mock-up of a *Chinook*

[92] Groenewald. Die veldhospitale, 1996 (Note 77).
[93] de Villiers. The medical aspect, 1984 (Note 54); van Jaarsveldt. Die stigting, 1983 (Note 75).
[94] van Jaarsveldt. Die stigting, 1983 (Note 75).
[95] Vassallo D. A short history of Camp Bastion Hospital: the two hospitals and unit deployments. *Journal of the Royal Army Medical Corps*. 2015; 161(1): 79.
[96] Vassallo D. A short history of Camp Bastion Hospital: preparing for war, national recognition and Bastion's legacy. *Journal of the Royal Army Medical Corps.* 2015; 161(4): 355-360.
[97] UK Ministry of Defence. Op Herrick casualty and fatality tables: index. 2010-15. https://www.gov.uk/government/collections/op-herrick-casualty-and-fatality-tables-index (accessed 20 December 2023).
[98] Vassallo. A short history, 2015 (Note 96).
[99] Bricknell. The Evolution of Casualty Evacuation, 1918 (Note 38).
[100] Benton. British surgery, 1977 (Note 91).
[101] Jones. A Report upon the Transport, 1904 (Note 44).

helicopter to enable accurate simulation of training scenarios.[102] Simulation-based training has recently evolved to include the use of virtual reality along with real-life objects in a so-called 'mixed reality' setting.[103] The aim of this is to mobilise specialist medical personnel in order to ensure casualty extraction in the shortest time possible.[104] Extensive training in modern day warfare, specifically military medicine in this context, is another stark contrast to the ill trained volunteers employed during the Anglo-Boer War.[105]

In preparation for the Anglo-Boer War, British and Boer forces were supplied with vastly different levels of medical care. The British were fortunate to have a newly established Medical Corps with much experience of front-line medicine. In contrast, the Boers had an extremely primitive set-up, in terms both of organisation and experience. Having stated this distinction, similar themes run through both sides when considering the problems encountered by each.

Training, essentially non-existent in the Boer camp, was also lacking for the British with poorly-practised stretcher bearers and military surgeons. Field hospitals and bearer companies were ill equipped with insufficient numbers of tents and staff, particularly nurses, while the Boers were almost completely without any ambulance service of their own and were forced to rely on the aid sent from other countries sympathetic to their cause. Fortunately, these ambulances were both plentiful and well equipped. Another challenge the British faced was preparing for the novel small calibre bullet that would become a feature of this war.

Organisation was perhaps the biggest issue for both armies, with the British experiencing friction between its field hospitals and its bearer companies, requiring the amalgamation of the two units, whereas the Boers found themselves completely unable to coordinate the foreign ambulances that came to their aid. Both forces were thus vastly underprepared for a war that proved to be far longer and bloodier than expected. Important lessons were learnt by both sides that would be invaluable in the development of their medical capabilities for modern day service and future conflicts.

[102] Vassallo. A short history, 2015 (Note 96).
[103] Stone RJ, Guest R, Mahoney P, Lamb D, Gibson C. A 'mixed reality' simulator concept for future Medical Emergency Response Team training. *BMJ Military Health.* 2017; 163: 280-287.
[104] Vassallo. A short history, 2015 (Note 96).
[105] Cottel. The Medical Services, 1903 (Note 42); van Jaarsveldt. Die stigting, 1983 (Note 75).

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