

# NINETEENTH CENTURY TECHNOLOGICAL DEVELOPMENT AND ITS INFLUENCE ON THE ANGLO-BOER WAR, 1899-1902

TD Potgieter<sup>1</sup>

## INTRODUCTION

Throughout the history of warfare technological developments have influenced the art of war. The difference between technological developments before and since the industrial revolution is essentially one of rapid profundity. Never before in the history of warfare have technology so profoundly and rapidly transformed war.

Technological developments and the industrial revolution did not only impact severely on the nature and organisation of societies, but also influenced warfare. In fact, industrialisation transformed warfare. Even the use of gunpowder as a propellant for missiles had not produced such rapid and profound changes as the industrial revolution. Indeed, despite the advent of gunpowder the longbow for example still dominated battlefields (because of its accuracy and rate of fire) during the fourteenth and fifteenth centuries. This could not however be compared with the rapidity of change brought about during the late 19<sup>th</sup> century. It is ironic that the intellectual developments of the industrial revolution era (with inventions, advances in humanitarianism and economics promoting the quality of human existence) also led to the creation of more efficient ways to destroy human beings and their artefacts.

The first important changes took place when the ideas generated by military thinkers of the eighteenth century, such as Marshal De Saxe, King Frederick the Great and Comte de Guibert, were put into practice by Napoleon. This created a revolution in tactics and the organisation of armies. For nearly four decades after the Battle of Waterloo technology brought little difference to the way in which wars were being fought. When the famous Austrian general, Count Radetsky, campaigned in Northern Italy during the 1840s the campaign was still "Napoleonic" in terms of its execution, but by the time Field-Marshal Roberts' British Forces

---

<sup>1</sup> University of Stellenbosch (SA Military Academy).

marched to the capitals of the Boer Republics in 1900, the mould was broken. The revolution technology wrought on the battlefield therefore started to show in the years 1840 to 1902, but it was only really evident during the First World War.

The most important technological developments during the nineteenth century that impacted on the Anglo-Boer War, were steam power and the development of iron and steel, making railways possible and revolutionising navies and maritime communication. As far as weapon development is concerned, small arms greatly increased in effectiveness, range, accuracy and rate of fire. Moreover, the machine gun was developed and smokeless powder came into general use. Though lagging behind small arms development for a while, artillery development also took place and by the end of the nineteenth century bigger and more effective guns and ammunition were the result. Together these developments drastically enhanced the power of the defensive and forced a radical change in tactics.

As the focus of this paper will be to analyse nineteenth century technological development and its influence on the Anglo-Boer War, only those developments that really fundamentally influenced strategy, and the conduct of operations and tactics, will be discussed. This is therefore not an effort to "tell the story" but an endeavour to deduce relevant aspects concerning the effect of technology. The article is to some extent a careful appreciation of some of the military "lessons learnt" during the Anglo-Boer War. The tragedy however is that many of these "points" were not taken up by the military planners after the Anglo-Boer War and had to be relearned on the massive killing fields of the First World War.

## **MOVEMENT, MOBILITY AND COMMUNICATIONS**

### **Railways**

One of the most important technological changes of the nineteenth century was steam power. Within a short space of time railways and steamships impacted dramatically on strategy and logistics, since they greatly enhanced the states' ability to project its power. If one considers the Anglo-Boer War strategically, steam power (ships and railways) provided mobility and made the projection of force easier. It also contributed fundamentally to logistics.

The first military insight into the impact of the railway was during the American Civil War. In a vast country, with a relatively weak infrastructure and not densely populated, railways were essential for the movement of troops and their switching from one centre of operations to another. During the two Prussian Wars (against Austria, 1866 and France, 1870-71) trains were invaluable for rapid mobi-

lisation and the deployment of troops to the front. Eminent problems were however that railway lines determined an army's possible line of operations and because of its vulnerability, troops had to be committed to its protection. If on the one hand it thus rendered strategy less flexible, it enhanced flexibility on the other hand. Troops and horses arrived fresh on the battlefield - the advantage increased with greater distances, less baggage had to accompany the army and strategically (specifically for a side operating on internal lines) swift reinforcements could be put into place. However, by the end of the nineteenth century, away from the railroads, transport had not undergone an analogous revolution. Movement was ponderous and essentially animal drawn, often dependent on good roads, bridges, fords and safe encampments.

In the vast distances of South Africa, the protagonists found the few railway lines operating invaluable. With the threatening war, the government of the ZAR placed all railways within the borders of the republic (mostly the property of the Nederlands Suid-Afrikaanse Spoorwegmaatskappy, NZASM), under the control of the state. This company and its officials served the republic well and contributed to the war effort by not only keeping the train service running, but by even repairing damaged guns at its workshops in Pretoria.<sup>2</sup>

When the republics built their railway lines military requirements were not important. The tracks from the republics reached the borders with the British territories at only four places, namely Volksrust and Van Reenen's Pass on the Natal Border and at Norval's Pont and Bethulie Bridge on the Border with the Cape Colony. From the heartland of the republics, forces and equipment could only be transported to three of these locations (Volksrust, Norval's Pont and Bethulie Bridge).<sup>3</sup> With regard to the long western border of the republics and the northern border of the Transvaal no railway link existed. The nearest points to the west were Bloemfontein and Klerksdorp, and to the north Pietersburg. The railway link with Lourenco Marques was important as it provided an international link that was not under British control and goods could be transported on it.

When the Boer mobilisation and movement of forces took place at the outbreak of the war, maximum use was made of the railways of the republics, specifically concerning the moving of forces and equipment to the border crossings. Having to move forces to the Natal front, the ZAR relied heavily on its railway link

---

<sup>2</sup> JH Breytenbach, *Die Geskiedenis van die Tweede Vryheidsoorlog in Suid-Afrika*, Vol. I (Pretoria, 1986), p. 102.

<sup>3</sup> Breytenbach, Vol. I, pp. 102-3.

with Natal. The line was extremely busy and most of the forces, animals, guns and equipment were disembarked in the Volksrust area.<sup>4</sup>

On the other hand the war is also an illustration of forces' dependency (even over-dependency) on railways. It sometimes provided a predictable - or even the only - line of advance. After the Boers besieged the towns of Kimberley, Ladysmith and Mafeking, the British hastened to relieve them. On all fronts the railways links were very important in moving the forces to the theatre of operations. General Paul Methuen's force of 8 000 men was sent to relieve Kimberley. He had a railway link to Cape Town, and everything had to be transported via this line. But this was a big handicap: everything depended on the railway line, since he (as Gen. Buller in Natal) had a shortage of animal transport and his force was desperately short of mounted troops. He had some wagons, but no oxen. With poor mobility and weak intelligence, his plan of attack was simple. He had to go for Kimberley and since a wide detour was out of the question without ox transport, he stuck to the railway line.<sup>5</sup> Tactically surprise the enemy and attack, while the trains would follow, was the idea. The advance took place and the trains followed up to Magersfontein, were they stopped. Clearly the need for mobility or a flanking movement then became painfully apparent.

Realising the value of railway links, the Boers destroyed the trains and railways of their enemy throughout the war. It is noteworthy that the first action of the war was the destruction of the railway at Kraaipan (50 km south of Mafeking) when General De La Rey captured an armoured train that transported much needed ammunition to the town. Winston Churchill was also taken prisoner after an attack on a train at the Natal front.

When the Boer forces fell back as Roberts advanced, the destruction of railways, bridges and tunnels took place. With the march to Bloemfontein and Pretoria, the maintenance of the railway line of communication (keeping the trains running) was considered vital by the British.<sup>6</sup> As it carried a considerable amount of operational and logistic traffic from the Cape<sup>7</sup> this indispensable lifeline had to be maintained. The British continuously employed a large number of forces to protect it.

After Pretoria had fallen, one of Roberts' most important objectives was cutting the Delagoa Bay line, since the Boer forces received important supplies and equipment via this line. When Buller arrived from Natal and after Middelburg had

---

<sup>4</sup> See D Reitz, *Commando* (Johannesburg, 1990), pp. 13-5.

<sup>5</sup> T Pakenham, *The Boer War* (Johannesburg, 1982), p. 180.

<sup>6</sup> WS Churchill, *Ian Hamilton's march* (London, 1900), p. 41.

<sup>7</sup> See Cape Archives (CA) DD1/84.

been captured, the British effectively cut the Delagoa link and also had control of the Durban-Pretoria line, which gave them a second line of supply.

During the guerrilla phase of the war the commandos regularly raided railway lines and blew up trains. Many an interesting tale of such actions can be found in the annals of the Boer guerrillas. General De Wet regarded the "obstructing of the enemy's lines of communication in this manner" as very important and explained how trains were initially blown up with dynamite and a fuse. It was however often dangerous to linger around too long with British troops on the approach and therefore a "mechanical device" was used. These devices resembled mines, as the Boers connected the barrel and lock of a rifle to dynamite and placed it under a sleeper. The weight of the passing train would then set off the device.<sup>8</sup> The effect was that more, or as De Wet stated "many more thousands of soldiers" had to be placed along the railway lines in order to keep it safe.

The protection of railway lines was therefore important and it became an integral part of the blockhouse system. Many of the strongest and biggest blockhouses were erected at bridges, tunnels and railway connections throughout South Africa. The protection of garrisons and railways in the Boer republics constantly consumed large forces and by March 1901 Kitchener had only 22 000 of his original force of 200 000 available for offensive operations. The rest were used as garrison forces and for protection.<sup>9</sup> By July, out of an army of about 250 000, Kitchener's effective army was only 156 000 of which he claimed that he had less than half with which to pursue the enemy. By March 1902 about 70 000 troops were deployed as "watchmen" of railways and blockhouse lines.<sup>10</sup> It is difficult to deduce from the figures the exact number that guarded railway bridges, lines, tunnels and connections, but it would be considerable.

Thus strategically, both sides automatically realised the value of railways and utilised them throughout the war or tried to deny their opponents their use. A lot of effort went into maintaining essential railway links and the endeavours to sever them.

### Mobility: roads

Because of the lacking railway infrastructure in South Africa, it could only contribute to an extent to the military needs of the opposing forces. For the rest horses, wagons and carts with draught animals had to suffice as the internal com-

<sup>8</sup> CR De Wet, *Three Years' War* (Galago, 1986), pp. 241 and 257.

<sup>9</sup> H Strachan, *European armies and the conduct of war* (London, 1988), p. 82.

<sup>10</sup> Pakenham, pp. 513 and 537.

bustion engine had not yet made itself felt. Within the Boer republics state roads that linked the different towns with each other existed as well as a large number of farm roads through private property. These roads were however not suited for constant heavy traffic like military convoys and when used often, quickly deteriorated into a bad state. Specifically when it rained these roads became bad and made the provisioning of supplies very difficult.<sup>11</sup> Movement often became quite slow, making convoys prone to attack.

### **Mobility: technology and the role of the horse**

Throughout the war, animals were utilised where technology did not or could not provide the required mobility. Because of the nature of many of the campaigns in which colonial powers were involved, cavalry retained an importance in the so-called colonial wars before the First World War that it had already lost in European wars. On the conventional battlefield the horse and rider provided a big target, and with the exception at Elandslaagte where the arme blanche had a field day, firepower had deprived cavalry of its shock effect in the charge. On the other hand the strategic importance of the horse for raiding, reconnoitring and reinforcement was unimpaired. In wars like the Anglo-Boer War the mobility it provided was specifically useful for reconnaissance, the outflanking of the enemy and for performing turning movements. Haig's cavalry quickly outflanked the Boer position at Magersfontein, but through hard riding, he virtually destroyed his cavalry force in the process.

One of the biggest problems with maintaining cavalry forces in the field, was providing sufficient forage and keeping horses fit and on active duty often in harsh conditions to which they were unaccustomed. Horses and mules of poor quality, being poorly fed and working hard, quickly broke down and became unfit to be used. On 7 March 1900 at Poplar Grove Lord Roberts planned a huge net around the Boers (including President Paul Kruger) and tasked Sir John French's cavalry to ride in a wide arc round the Boers and turn to attack from the rear. French's cavalry moved slowly as his "horses were in an increasingly poor condition ... [and] were too done up to ride further".<sup>12</sup> The President and the Boers got away in their wagons.

Wars in South Africa always emphasised the need for horsemen. Without any cavalry tradition, but with a tradition of horsemanship, their horses provided the Boer forces with strategic mobility. It made movement over long distances across the veldt possible and took the burgers from battlefield to battlefield, where they

---

<sup>11</sup> Breytenbach, Vol. I, p. 103

<sup>12</sup> R Kruger, *Good-Bye Dolly Gray* (London, 1960), pp. 264-5.

fought like infantry, utilising their modern rifles to the full. Therefore technology and the horse married easily in the Boer way of fighting.

British commanders quickly learnt and understood the value of horses in South African conditions. For the British, the difficulty with supply, the inadequate railway system and the heavy reliance they had to place (specifically later in the war) on small bodies of men moving fast in flying columns or patrolling great areas increased the value placed on mounted infantry. Horse mobility was essential for flying columns. But there were never enough horses - field commanders always needed more horses.<sup>13</sup>

Beside the strategic worth of the horse, war in South Africa was always hard on horses. They paid dearly for the human squabbling, as the British lost 66 % of the approximately 500 000 horses they used during the Anglo-Boer War<sup>14</sup> and the British War Office reckoned that 400 346 horses, mules and donkeys were "expended during the war".<sup>15</sup>

### Communications: telegraph

With the size of armies increasing during the nineteenth century, tactical control was a severe problem. On the strategic level though, the electric telegraph had advanced in step with the railway. Long distance communication became quick and easy, adding a new dimension to campaigning far from one's base. Armies in the field could thus be linked to their capitals or higher headquarters. But the system lacked mobility, it could be tapped and was easily cut or disrupted.

In contrast with railway links that only partially fulfilled military needs, the Boer republics had a telegraph system that served the purposes of war well. Altogether there were a total of 215 telegraph offices in the Boer republics by 1899.<sup>16</sup> The State Artillery of the ZAR also had a field telegraph section, which made telegraph and heliographic contacts in the field possible during operations. The republican telegraph system therefore linked capitals, headquarters and the different fronts with each other and messages, orders, and information passed from capitals to fronts, from front to front and commanders to commanders. A glance at the heavy operational traffic the telegraph carried during the war clearly illustrates its strategic worth.<sup>17</sup>

<sup>13</sup> Cape Archives (CA). DD1/83. Colonial HQ to Stellenbosch, 19 April 1901.

<sup>14</sup> Strachan, p. 84.

<sup>15</sup> Pakenham, p. 572.

<sup>16</sup> Breytenbach, Vol. I, pp. 104-5.

<sup>17</sup> See CA. DD1/83 and 84.

Because of its importance, both sides often targeted telegraph communications. As Boer forces advanced into British held territory, one of the first things they did was to cut the telegraph lines and destroy British telegraph equipment if possible.<sup>18</sup> As they advanced on Kimberley and isolated the town, they cut the wires and the telegraph links to Kimberley were already severed on 15-16 October 1899.<sup>19</sup> In a graphic report the station-master at Belmont provided an account of how his telegraph equipment had been smashed by the Boers who were "drinking in the Bar", stating that "a more miserable lot of men I never saw".<sup>20</sup>

Throughout the Anglo-Boer War the telegraph system played an important role. During the guerrilla phase of the war telegraph communications were indispensable to dragnet operations and assisted the flying columns in hunting down the guerrilla forces. Therefore it became an important target of the Boer guerrillas, and lines were usually cut when they moved through the blockhouse lines.<sup>21</sup>

### **Mobility and communications : the bicycle**

The development of the bicycle was perfected during the late nineteenth century, mainly because of improved metallurgical processes that made a lighter and stronger bicycle possible. This innovation was also utilised during the war. In an effort to maintain communications where there were no telegraph offices the newly developed bicycles came in handy. The ZAR created a **Wielrijders Rapport-gangers Corps** that used bicycles. They specifically kept communications going between commandos and telegraph offices in the northern and north-western parts of the Transvaal, and commandos that had been deployed far-off kept in contact with the capital and the rest of the force. For the purpose of despatch-riding and scouting the Cape Colony Cycle Corps was also established in December 1900.<sup>22</sup> They did excellent work as scouts and despatch-riders, specifically when field forces were cut off from telegraph communication.<sup>23</sup>

### **Movement, mobility and lines of communication : maritime power**

Steam propulsion systems, the development of steel and the radio had a fundamental influence on navies during the late nineteenth century. Naval techno-

<sup>18</sup> Many examples exist: See CA. GH27/5. Hely-Hutchinson-Chamberlain, 18 June 1901.

<sup>19</sup> CA. GH26/399. Report from Station-master at Warrenton, 3 February 1900.

<sup>20</sup> CA. GH26/398. Report from Station-master at Belmont in connection with the Transvaal crisis, 28 October 1899.

<sup>21</sup> See De Wet, p. 307.

<sup>22</sup> J Stirling, *The colonials in South Africa, 1899-1902* (Edinburgh, 1907), pp. 238-9.

<sup>23</sup> See CA. DD1/83.



logy advanced at a dazzling rate and many professional officers had difficulty in keeping up with the changes. It in essence made bigger and faster ships possible and with the radio, navies could control and deploy ships around the world.

When the war broke out, Britain transported an immense body of soldiers with equipment and supplies over a distance of at least 6 000 miles (the distance from Southampton to Cape Town). South African harbours had never seen so many liners and so many troops, and a dense net of funnels, rigging and masts crowded Table Bay specifically during the autumn of 1899 and early 1900. Still more and more ships arrived. Mahan reports that between 20 October 1899 and 31 March 1900 a "truly gigantic figure" of approximately 166 277 men sailed for South Africa from Britain (not counting troops that arrived from India). The Royal Navy essentially oversaw the process. The meticulous planning done by the Admiralty and the control the Royal Navy exercised at the different ports during the movement of the troops were remarkable feats.<sup>24</sup>

During the rest of the war the movement of troops and supplies into South Africa continued. The British Empire's many naval bases, with behind them often a loyal population, made an indispensable contribution. The enormous resources of the empire and the capacity to mobilise, utilise and move it led to substantial forces being moved to South Africa from Britain, Australia, Canada and New Zealand. Altogether about 450 000 imperial and colonial troops served in South Africa.

The effect of British naval mastery was also illustrated in the fact that the Royal Navy had the capacity to stop other European nations, who sympathised with the Boers, from putting their sympathy into meaningful support. In fact the historian GD Scholtz is emphatic that historians neglect British sea power as a crucial determinant in the history of South Africa. It was essentially British sea power that prohibited other powers from getting involved in the affairs of southern Africa.<sup>25</sup>

General Buller wanted the Royal Navy to impose a complete naval embargo on the Boer Republics, by blockading the Portuguese port at Delagoa Bay. Although Milner backed him, the British Cabinet only agreed to an arms embargo.<sup>26</sup> As a result the Royal Navy prudently kept an eye on shipping to Delagoa Bay, even forcing into port and searching three German ships, the *Bundesrath* (in December 1899) and the *Herzog and General* (in January 1900), on suspicion that they

---

<sup>24</sup> AT Mahan, *The story of the war in South Africa* (London, 1901), pp. 84, 94-5.

<sup>25</sup> GD Scholtz, *Die Afrikaner en die See* (Johannesburg, 1969), pp. 51-3.

<sup>26</sup> Pakenham, p. 163.

carried arms and ammunition to the Republics. They did not, and the incident created a storm of protest in Germany.<sup>27</sup>

Shortly after the outbreak of the war the British concluded a secret treaty with the Portuguese, in which the British vowed to defend all Portuguese colonial possessions if the Portuguese promised to stop the movement of arms and ammunition to the ZAR for the duration of the war. British officials thus co-operated closely with Portuguese officials in Lourenco Marques.<sup>28</sup>

The Royal Navy kept a close watch on the South African coast and harbours for the remainder of the war. British warships were everpresent. This even led to the odd scrap with a Boer patrol. This incident occurred on 10 October 1901 when a Boer patrol exchanged fire with the *HMS Partridge* in Saldanha Bay.<sup>29</sup>

The Anglo-Boer War is a good example of the role maritime power and naval forces can play in the projection of force. In this case the fact that there was no threat along the long sea lines of communication, also made it much easier for Britain. British maritime capacity was therefore a critical variable that ensured success in the war. Military power consists principally of two factors, force and position, and the British had both. The proper positioning of their force in the theatre of operations was made possible by maritime and naval power and facilitated by the improvements in technology and communication.

## WEAPONS DEVELOPMENT AND ITS IMPACT ON TACTICS

### Infantry weapons and tactics

The first important improvement in the development of infantry weapons during the nineteenth century was the adoption of the percussion lock in place of the flintlock. Combined with the rifled barrel and the Minié bullet this increased the range and accuracy of the muzzle-loader, also giving it an all-weather capability. The breech-loading rifles that followed had the advantage of the centre of gravity in the rifle being nearer to the shoulder, which enhanced accuracy. It was also possible with a breech-loader to load and fire from the prone position, while its main attribute was its enhanced rate of fire. Changes now followed rapidly as the infantry rifle developed the traits that would characterise it until after 1945: metallic cartridges simplified the problems of loading and extraction, while nitro-glycerine

<sup>27</sup> Pakenham, p. 253.

<sup>28</sup> F Pretorius, *Life on commando during the Anglo-Boer War* (Cape Town, 1999), p. 83.

<sup>29</sup> JA Smith, *Ek rebellieër* (Cape Town, 1946), pp. 88-9. See also J Burman and S Levin, *The Saldanha Bay story* (Cape Town, 1974), p. 116.

ensured a more powerful explosion with greater ranges and less smoke as the result. The first generation of weapons embodying these changes were also breech-loaders. Amongst these were the German Mauser of 1884 and the British Lee Metford of 1889. This period also saw the development of a number of machine-guns, but by the end of the nineteenth century the general tendency to deploy the machine-gun as part of the artillery rather than as a weapon for close infantry support forfeited much of its inherent advantages. By 1900 technology had wrought a revolution on the battlefield and the rate and range of small arms had increased tenfold. Hence infantrymen had a rifle with greatly increased effectiveness, range, accuracy and rate of fire, ideally suited for the defensive.

In terms of infantry weapons both forces went to war primarily armed with the newest type of bolt action magazine rifles. The mainstay of the Boer forces were the Mauser (the republics had 49 810 Mausers by 1899), with a calibre of 7mm and the Martini-Henry (they had 43 752 by 1899) with a calibre of 11,4mm. When new rifles were to be procured by the middle of the 1890s many Boers, like the Commandant-General, favoured the Martini-Henry, since it was regarded as a deadly weapon. But the Martini-Henry was in essence obsolete by 1899, since it was a single action rifle with a range of only 1 800m that used black powder betraying the position of the shot and one could carry a limited amount of its heavy rounds. The Mauser on the other hand had a high velocity with a maximum range of up to 4 000m, used smokeless powder, whilst loading and reloading was quick and easy since five light rounds were linked together in a steel cartridge. The standard British infantry weapon were the Lee-Metford and Lee-Enfield 7,69mm caliber magazine rifles taking 10 rounds (to be loaded one by one) with a range of about 2 800m.<sup>30</sup>

The problem with the increased firepower was that it enhanced the defence and not the attack. This created a tactical dilemma; how to combine the acknowledging of the supremacy of musketry with the ability to keep moving? The answer was in smaller and more dispersed formations with command delegated to lower levels. As the nineteenth century tactical debate continued, the Prussian general Helmut Von Moltke deduced that as the weak points would still be the flanks, the enemy had to be forced by flanking marches and envelopment to take the tactical offensive. Prussian infantry would break the assault with firepower, then attack. Moltke thus fused the strategic offensive with the tactical defensive.

At St. Privat, in 1870 during the Franco-Prussian War, Prussian troops advanced in columns of half-battalions with skirmishers deployed in front and

---

<sup>30</sup> Breytenbach, Vol. I, pp. 21 and 79-82.

suffered heavy casualties against an enemy determined to fight a tactical defensive battle. They learnt quickly and soon attacked in loose lines, using cover and supporting each other as they advanced in bounds. Prussian thinking therefore stressed the reciprocal support of advancing and firing while making effective use of cover. "Small units with command delegated to junior officers and NCOs were therefore best."<sup>31</sup>

Within the British system some officers regarded open order and individual fire as the best tactic, which led to a new drill book, emphasising open order moving away from the Aldershot set-piece battle, being adopted in 1896. Despite this, many officers still favoured the solid line formation, strict fire discipline and bayonet charges.<sup>32</sup>

The Boer military system favoured the individual. Traditionally the burgher often had to fend for himself and the majority of the population, male and female, were generally exposed to firearms from a young age.<sup>33</sup> No western style army existed (besides the Artillery of the republics) and burghers were organised in commandos, based on the area they resided in, while they also elected their own officers. Boer military experience had mainly been in conflicts against the local population. In contacts they usually took cover, using the natural features of the ground and skilfully strengthening it, often with entrenchments. They knew how to use their weapons to the best, often at extreme ranges, individually deciding when to shoot at the enemy, ensuring accurate fire.<sup>34</sup>

In the field of tactics, the increased firepower together with the magazine rifle and smokeless powder on the defensive led to some unexpected surprises. The value of marksmanship was also graphically illustrated (a scenario that compares well with the realities of 1914). A few harsh battlefield lessons were thus to be learnt in a short time.

As General Methuen's column fought their way to Kimberley, forcing the Boers from their positions at Belmont, Graspan and Modder River, they suffered close to 500 casualties with the Boers scarcely losing a man. At Magersfontein on 10 December 1899, during "Black Week" (a period in which the British suffered a series of defeats), Methuen launched heavy attacks on the Boers who were firmly entrenched. He did not force the Boers out of their positions, suffering 210 dead

---

<sup>31</sup> Strachan, pp. 114-6.

<sup>32</sup> LS Amery, *The Times history of the war in South Africa*, Volume II (London, 1902), p. 32.

<sup>33</sup> Breytenbach, Vol. I, pp. 29-30.

<sup>34</sup> Historical Section of the Great General Staff, Berlin, *The War in South Africa* (London, 1906), p. 325.

and 675 wounded and achieved nothing. His gunners concentrated their fire on the hills, while the Boers were entrenched in front of the hills. Since his gunners and soldiers hardly saw any of the defenders, the Boers suffered few casualties. The combined effect of smokeless powder and bolt action magazine rifles on the defence used by an enemy skilled in marksmanship led to a murderous fire.<sup>35</sup> The British troops and their artillery did not know where the enemy was, and if they ventured into the killing zone they immediately came under fire, resulting in high casualties.

The Colenso saga amounts to a variation on the same theme. Buller's forces attacked the Boers on 15 December 1899. Boer forces were on the defensive and entrenched. British artillery failed to establish the defensive positions and moved too far forward, within range of the new rifled small arms. British Infantry was kept in close order and got lost in difficult terrain while under enemy fire, which devastated their columns.<sup>36</sup> British losses amounted to 1 138 dead, wounded and missing, while the Boers gained eleven guns, losing around forty men in the process.

On the western front Kitchener walked the same path. With Roberts temporarily sick, he ordered a direct attack on the Boer laager at Paardeberg, with predictable results; 320 killed and 1 000 wounded. As subsequent events however showed, artillery technology provided the weapon that made the knockout blow at Paardeberg possible.

An interesting case on the Natal front however was the Battle of Elandsplaagte that took place a little earlier in the war on 21 October 1899. Although this battle was the typical three-act affair it had some notable features. A frontal attack as well as a flank attack took place simultaneously. Col. Ian Hamilton, in charge of the infantry attack, gave the order for the three infantry units to deploy in extended order. Furthermore, though the 1<sup>st</sup> Devonshire Regiment undertook their frontal attack in true Aldershot style, acting on whistles and firing in volleys, their acting Commanding Officer, Maj. Park, gave the order for individual fire.<sup>37</sup> Despite the fact that the battle had features like a bayonet attack and a cavalry charge, the infantry attack was well done and artillery supported the attacking infantry well, preventing effective fire from the burghers.<sup>38</sup>

---

<sup>35</sup> G Parker (ed.), *Cambridge illustrated history of warfare* (Cambridge, 1995), p. 249.

<sup>36</sup> Kruger, pp. 136-42.

<sup>37</sup> F Maurice, *History of the war in South Africa*, Volume I (London, 1906), pp. 164-5.

<sup>38</sup> Breytenbach, Vol. I, pp. 249-50.

How was it then that the Boers tactically had the right idea in the first phase of the war - as Moltke suggested the strategic offensive fused with the tactical defensive? Did they read Moltke? No, probably not. However, they had a good understanding of the devastating effect of firepower and understood the value of cover. This is clearly illustrated by Commandant-General Joubert's advice to Botha (Joubert's successor)<sup>39</sup> as well as by his initial understanding of the campaign plan in Natal. He stated that he wanted to induce the British to attack the Boers ("uit hul 'kampen en fortien' uit te lok om die Boeremagte te kom aanval").<sup>40</sup> Another reason for the Boer approach could perhaps be found in their military experience in South Africa. Boer forces had mainly fought against the indigenous population and already had, at an early stage, learnt the value of surprise and stealth from their adversaries like the Khoisan and the Xhosa. They had also learnt from conflicts with massed forces like the Zulu that concentration of firepower on the defensive is a crucial key to success. These experiences formed the Boer approach. It was the type of approach that ensured success and as the Boers, being a citizen force, did not want to suffer heavy casualties, being on the defensive and utilising cover at the same time seemed a good option. During the Anglo-Boer War however, technological development, specifically with regard to small arms, gave a new and deadly meaning to this traditional way of war.

The Boer approach was good when fighting on the defensive to repulse enemy attacks, and when the object was to hold a section of ground, or to gain time. But it offered no tactical solution when taking the offensive because there was no comprehensive system of military training, discipline was generally weak and Boer leaders usually did not want to annihilate their enemy. They thus held to their positions, which in essence was negative, and could not result in positive gains.<sup>41</sup> British generals on the other hand sought victory through decisive action and efforts to destroy their enemy in resolute attacks. These attacks were however initially launched in an outdated way, without recognising the revolution technology had brought. As Pakenham so accurately puts it: "The reason for those humiliating reverses was not the marksmanship of the Boers, nor their better guns or rifles, nor the crass stupidity of the British generals. ... the smokeless, long-range, high velocity, small-bore magazine bullet from the rifle ... plus the trench - [that] decisively tilted the balance against attack and in favour of defence."<sup>42</sup>

---

<sup>39</sup> Breytenbach, Vol. II, pp. 240-3.

<sup>40</sup> Breytenbach, Vol. I, p. 166.

<sup>41</sup> Historical Section of the Great General Staff, Berlin, p. 325.

<sup>42</sup> Pakenham, p. 574.

## Development of artillery and the tactical role of guns

With reference to rifling and breech-loading, technology found it easier to perfect small arms. Since the range of smooth bore field artillery did not compare favourably to rifles and it had a slow rate of fire, the rifle led the way for most of the nineteenth century. Some even predicted the demise of artillery. A number of important developments however led to the revival of the field-gun. These were the development of the fuse and percussion fuse for high explosive (HE) and the shrapnel shell; also a progressive increase in weight and size (consequently also range because of larger charges); as well as the improving quality of wrought iron and better metallurgic processes. Smokeless powder and steel allowed for greater muzzle velocity, which made guns bigger with an increased range. With the development of a mechanism in which the barrel recoils without moving the gun-carriage, rapid fire could be maintained without pause, as it was no longer necessary to bring the gun back and re-aim it after every round. With the development of guns like the French 75mm quick firing gun of 1897 (firing up to six aimed shells a minute with a maximum range of about 8 000m) a new trend in artillery design and practice was set.<sup>43</sup> By the end of the nineteenth century, with breech-loading, rifled barrels as well as improved ammunition increasing the range and accuracy of guns, the artillery evolution was in essence complete.

With the outbreak of the war, both sides had new guns in use. The Boer republics realised the importance of the new artillery and Joubert did succeed in building up a modern and excellent artillery corps by ordering some of the latest pieces of artillery from Europe. But, they did not have enough when the war started and never had enough concentrated firepower to affect the outcome of battles. Amongst others the Boer artillery consisted of four of the latest 155mm heavy guns and six of the well-known 75mm field-guns from Creusot, plus four 120 mm howitzers and twenty-two 75mm field guns (the OFS had fourteen) from Krupp as well as twenty Maxim-Nordenfield 1-pounders (Pom-Poms).<sup>44</sup> Though modern, this was small by European standards and although the ZAR ordered more 74mm guns from Creusot, it was too late and the guns were never delivered. The most important British guns in use were the Armstrong fifteen-pounders of the Royal Field Artillery and the Armstrong twelve-pounders of the Royal Horse Artillery. Numerous other guns were also used like the naval twelve-pounders and 4.7" naval guns on special mounts, manned by the Royal Naval Brigade. The Royal Horse artillery was organised in 21 batteries while the Royal Field Artillery comprised of 103 batteries by the end of the war.<sup>45</sup> Both sides also had a number of machine-

<sup>43</sup> Macksey, p. 40 and Strachan, pp. 117-9.

<sup>44</sup> Pakenham, p. 41.

<sup>45</sup> Breytenbach, Vol. I, pp. 13-4 and 22-4.

guns, but no doctrine for the use of the machine-gun primarily as an infantry weapon was in place and, as it was usually deployed by/with the artillery, it had no fundamental effect on battles and tactics.

Often, when Boer forces were preparing their defensive positions, the Boer artillery would calculate the range and put out markers (white stones or biscuit tins) at measured intervals. A good example of this practice is the Battle of Modder River where markers were laid out to aid the riflemen and artillery.<sup>46</sup>

Since Boer artillery was normally outnumbered they did not deploy their guns in batteries and did not duel with British artillery. In typical republican tradition the guns were deployed with the different commandos along the front. Guns were kept concealed as much as possible and even moved around on the battlefield during the battle, as Major Albrecht did with the Free State Artillery at Modder River.<sup>47</sup> The same pattern was generally followed. On the Tugela front, before the British breakthrough at Pieters Heights, the ZAR State Artillery had only 11 guns available on the front and kept their guns well spread out and camouflaged. There were two reasons for this: firstly the illusion of more guns could be created and secondly it was safer for the guns as counter-battery fire had less of an effect and it was easier to move one gun than a whole battery.<sup>48</sup> Boer artillery was also deployed at the towns they besieged, but it never played a decisive role as the bombardments lacked volume and intensity.<sup>49</sup>

British artillery was usually used to bombard the enemy positions before the battle. Yet there was normally no real co-operation between infantry and artillery to obtain the maximum effect and often "artillery and infantry engagements formed two distinct operations".<sup>50</sup> The Boers would stay hidden during the artillery bombardment knowing that the British artillery would often cease fire when the infantry got within close range of their enemy - ironically at the stage when the support of the guns would be most essential.

<sup>46</sup> Kruger, p. 115 and Pakenham, p. 197.

<sup>47</sup> CJ Nöthling (ed.), *Ultima ratio regum: Artillery history of South Africa* (Pretoria, 1987), pp. 71-82.

<sup>48</sup> CM Bakkes, *Die militêre situasie aan die Benede-Tugela op die vooraand van die Britse deurbraak by Pieters Hoogte* (MA thesis, University of Pretoria, *Argief Jaarboek vir Suid-Afrikaanse Geskiedenis*, No. 30, I), pp. 20-1 and 23.

<sup>49</sup> Nöthling, pp. 75-82 and 87.

<sup>50</sup> Historical Section of the Great General Staff, Berlin, p. 328.



At Pieters Heights British artillery played a more important role. Buller concentrated his artillery (70 of his 85 guns south of the Tugela)<sup>51</sup> and the guns pounded Boer positions incessantly, also providing constant fire support to the infantry when they advanced. On the Boer side it had a demoralising effect. Some left their positions, or went higher up the hill, while others stayed in their entrenchments. Eyewitnesses afterwards stated that being subjected to this artillery bombardment were some of the most difficult situations they experienced during the war.<sup>52</sup> During the rest of the war artillery played a minor role, firstly since the Boer guerrilla had no artillery and secondly they did not provide artillery targets to the British as in the set-piece battles of the opening stages of the war.

In essence both sides thus deployed modern artillery. Artillery played an important role during the first phase of the war and the Boer artillery was probably most successful at Magersfontein and along the Tugela. The British artillery bombardments on Boer positions during the first phase of the war, often did not achieve their desired result as the Boers stayed in their shelters during the preliminary bombardment. However, the Paardeberg example illustrates the effect of modern artillery as a siege weapon against an enemy on the defensive - subduing the Boers essentially with artillery. This pointed to things to come and was a premonition of the First World War when commanders, faced with costly frontal attacks, relied heavily on artillery. But despite the successes and failures of artillery, a doctrine for the thorough battlefield integration of the "new" artillery with other weapons systems (specifically infantry) was still lacking.

### **New weapons providing the tactical key to success**

In common with the history of warfare, technology has always influenced war. The Anglo-Boer War also illustrated that military forces adapt themselves to the experiences which they gain through war. Specifically noteworthy in the case of the Anglo-Boer War is the way British tactics developed when having to advance against a strongly entrenched enemy.

During the first phase of the war, British generals struggled to take the offensive in the face of an entrenched enemy on the defensive. Flanking movements could solve the problem, but for a variety of reasons this was not always possible. Generals in the First World War experienced the same dilemma, and it took them a long time and many casualties to "get it right." A new integrated

<sup>51</sup> Some sources give the total strength of Buller's artillery on 27 February as ninety-one guns. See Maurics, Volume II (1907), p. 510.

<sup>52</sup> See Bakkes, p. 25, Reitz, pp. 89-91 and Amery, Volume III, p. 536.

tactical approach was necessary. However at Pieters Heights it seems that Buller got it right - did he, or are we judging with hindsight?

Before the battle at Pieters Heights it was clear that Buller appreciated the fact that the old "three-act" one-day battle was antiquated because of the combined effect of the trench and the magazine rifle. A new system of offensive tactics was needed, in which a battle would be a series of interlocking engagements, spread over days (even weeks) and a large front. The infantry had to make better use of ground and cover and use more individual initiative, while they received constant fire support from the artillery.

At Pieters Heights artillery performed an important role. Amery states that they had to follow the infantry attack closely, shooting "just over the enemy's trenches and thus keep up the impression of sustained shelling".<sup>53</sup> Pakenham emphasises that the artillery had to be concentrated and were not only to participate in the first act of the battle, but to provide continuous fire, "day after day, throwing a creeping barrage ahead of the advancing infantry".<sup>54</sup> By his explanation Pakenham equates the role of the artillery at Pieters Heights to the style of tactics that evolved during the First World War, when artillery provided close support to infantry attacks with curtain fire and creeping barrages. But was this really the case in February 1900 at Pieters Heights?

General Warren's orders, issued before the battle, stated simply that artillery "is going to support these attacks".<sup>55</sup> Very telling, however, of the tactical approach are the **Special Instructions for Artillery**, which state the following: "Follow the infantry attacks up closely. When no longer safe to shoot at enemy's positions, do not cease fire, but shoot over the enemy's trenches, 'pitching them well up', so as to make the enemy think he is still being shelled, and also catch him as he runs down the other side."<sup>56</sup>

Furthermore, before the attack began, the artillery commanders were told that they had to support the infantry attack and keep up fire to the "very last moment". When it became too dangerous to shell Boer positions without running the risk of hitting British troops, "elevation and fuses were to be increased by at least five hundred yards, so as to bring grazing fire upon the reverse slopes of the hills and thus harass the Boers as they fled".<sup>57</sup> The infantry assault on the hills therefore took

---

<sup>53</sup> Amery, Volume III, p. 535.

<sup>54</sup> Pakenham, pp. 345-6.

<sup>55</sup> Maurice, Volume II, p. 508.

<sup>56</sup> *Ibid.*, p. 509.

<sup>57</sup> *Ibid.*, pp. 509-10.

place with the close support of the artillery and as the infantry advance reached the Boer positions it is clear that the artillery did not stop firing, but had to lift its fire.<sup>58</sup>

The way the action at Pieters Heights is explained in contemporary sources makes it very difficult to accept that a "creeping barrage" in the true sense of the term was indeed used to cover the infantry advance, but artillery did provide close support to infantry. On the other hand the term was not really used before the First World War, and it was not yet battlefield practice by the outbreak of the First World War. Important though is that the artillery supported the infantry assault at Pieters Heights. It was not only a preliminary bombardment but constant fire on the enemy even as the infantry advanced. In this sense it was *First World War in style* and not in the pattern of the traditional use of artillery in the British army at that stage.

Taking the above into consideration, some important tactical innovations do stand out, specifically the fact that a *new system* of offensive tactics evolved, in which the battle was a series of engagements, on a large front (about three miles<sup>59</sup>) against an entrenched enemy. Furthermore, infantry made use of cover and relied on continuous concentrated fire support from the artillery. In this sense, already during the Boer War, new technology had a drastic influence on tactics, in as far as the close co-operation between arms of service in modern war, was shown to be of the essence.

## CONCLUSION

During wars, opposing military forces usually adapt to the experiences they have gained and often methods of warfare at the end of the war differ markedly from those at the beginning of the war. During the Anglo-Boer War two adversaries met, both initially possessing armaments representing the most recent in terms of technological inventions and developments. Their weapons included small calibre magazine rifles with smokeless powder, artillery firing high explosive and shrapnel shells, heavy long-range guns and howitzers with low trajectories and high angle fire.

These new weapons, brought about by improved technology, wrought a revolution on the battlefield. Already in the first clashes, it was evident that the magazine rifle in the defensive made the offensive extremely dangerous. Indeed the ideal was to fuse the strategic offensive with the tactical defensive, but if you cannot induce your enemy to attack you how do you take the offensive? The need

---

<sup>58</sup> Bakkes, p. 38.

<sup>59</sup> Amery, Volume III, p. 535.

for new and improved tactics became apparent. It was necessary to concentrate more on individual fire, reciprocal support of advancing and firing and making effective use of cover. Furthermore, artillery and infantry had to co-operate during the battle with the artillery constantly providing fire support to the advancing infantry.

The British ability and willingness to concentrate superior resources and manpower in South Africa and on the different fronts, maintaining this concentration for the duration of the war, facilitated British victory. Steam power on land and at sea showed its worth and modern communications, specifically the telegraph, were indispensable in the process.

Britain had an enormous empire and large maritime resources together with British naval mastery. Strategically it was possible for the British to rally its immense empire around the Union Jack and to have freedom of the seas. This meant that substantial forces were moved to South Africa from Britain, Australia, Canada and New Zealand. The vast resources of the empire and the capacity to mobilise, utilise and transport it (brought about essentially by the technological development and better communications) therefore made the final result of the war inevitable.

The war had an important impact on the British Army as it resulted in a considerable emphasis on infantry training and musketry. Much has been said about the inability of British generals to learn lessons from the war. They did recognise the devastating effect of modern weapons, but against an well-armed and strong opponent on the European continent it was difficult to adapt. In many senses, aspects of the war were a portent of what was to come in "the war to end all wars", as European military observers seemingly failed to grasp the lessons brought about by technological development. They took note of the lessons but did not implement them, as conflicts outside the European theatre such as the Anglo-Boer War and the Russo-Japanese War were not regarded as important examples. The First World War showed how wrong these deductions were. The problem with learning how technology impacted on warfare from wars like the Anglo-Boer War, was one of analysis.