

# MISSILE INJURIES

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## Over a century of service: the .303 projectile and its wounding capabilities - a historical profile<sup>1</sup>

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‘We shot them under rule .303’<sup>1</sup>

### ABSTRACT

The .303 military round has been around for over 100 years and went from a round nose projectile full metal jacket, Mks I and II, to a soft point Mk II\*, the so called dum-dum projectile. The hollow points, Mks III, IV and V, followed before going back to the round nose full metal jacket bullet Mk VI, and finishing with a spire point Mk VII.

The projectile was dogged with controversy; first, for being not lethal enough, then too lethal, then the non full metal jacket bullets were banned under the Le Hague Convention in 1899 but were still used until 1904, then the projectiles were considered too lethal again. The spire point projectile was dual cored making the centre of gravity at the rear of the bullet causing it to tumble when striking tissue.

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### INTRODUCTION

The .303 round first saw active service in India in the late 1800s. Australian Forces first used it in the Boer War with the Lee Metford and last used it with the No.1 Mark III\*HT (Aust) Sniper rifle<sup>2</sup>, which was replaced in 1979 by a 7.62 NATO sniper rifle<sup>3</sup>. In its first twenty years, the ball round went through ten official changes and several unauthorised battlefield changes.

### HISTORY

#### Powder Rounds

The .303 round first entered British service in 1889 as the Powder Mark I, which was loaded with black powder, a boxer primer (one using a single flash hole), and a full metal jacket bullet<sup>4</sup>. The round was used for only one year, as the jacket of the projectile

tended to detach from the lead core, and in 1890 was replaced with the Powder Mark II that had a thicker jacket and improved design<sup>4</sup>.

This round again only lasted one year as it also had a major design problem like the 577/450 Martini-Henry it replaced. Being loaded with black powder meant that, when fired, the smoke produced betrayed the shooters position and obscured his field of fire<sup>4</sup>. The replacement round for the Black Powder Mk II was loaded with smokeless powder and called the Cordite Mark I.<sup>4</sup> None of these rounds saw active service as they were soon replaced by the Mark II round<sup>4</sup>.

#### Cordite Rounds

The Cordite Mark II round, which now had berdan priming (twin flash holes), started production in 1893 and was produced in Britain as well as Canada, India and New Zealand<sup>1</sup>. This round saw service in India and Africa. Australia started production of this round in 1900<sup>5</sup> and changed to the Mark VI round in 1904<sup>5</sup> or 1905<sup>6</sup>.

Complaints were soon coming back from the colonies that the new service round lacked sufficient killing power. In Africa, there were complaints that in conflicts the Mark II bullet lacked the damaging power of the old Martini-Henry bullet<sup>7</sup>. During the Chitral Operations in India, captured Mullahs were executed in secret by firing squads using both the old Martini-Henry and the new .303 rifles to compare the injuries at post-mortem<sup>8</sup> as the troops were complaining about the lack of stopping power as well<sup>9</sup>.

#### Dum-Dum Rounds

This problem was addressed in India with the introduction of the Mark II Special or Mark II\*, made at the Dum Dum Arsenal<sup>4</sup>. The term dum-dum has become synonymous with any bullet not having a full metal jacket. It was actually a normal Mark II bullet with 1mm depth of jacket at the nose removed and

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giving a 4mm-diameter circle of lead core exposed<sup>10</sup>. This made it a soft point bullet, which was made in India and Britain.

Much was made of the increased effectiveness of the Mark II\* projectile and it took on almost mythical proportions. The House of Commons requested a report on the effectiveness of the bullets used in India and this was presented on 8 July 1899<sup>11</sup>. It is the definitive work and lists the injuries of the Mark II & II\* bullets on people shot by them from 1895 to 1898, as well as tests done on bullocks. A field modification of the projectile where 1/12 of an inch was filed off a Mark II round was also tested. The filing off of tips of Mark II bullets was commonly done in India<sup>12</sup> and in Sudan<sup>4</sup>.

### Other Rounds

The British War Office was busy responding to the problem by trialling six various hollow and soft point projectiles in 1896-1897 and decided on a new round, the Mark III<sup>4</sup>. The Cordite Mark III round was issued in October 1898 and withdrawn almost immediately due to problems in production of the projectile<sup>13</sup>. It is of note that no loaded rounds are known to still exist.

The Cordite Mark IV round was issued in February 1899<sup>4</sup> and also suffered from design problems, with the jacket sometimes staying in the bore of the rifle after firing<sup>14</sup>. This round was manufactured in Britain, Canada and New Zealand<sup>6</sup>. It was widely issued and was well reported on by troops in the Sudan<sup>4, 12</sup>. The Mark V round replaced it in October due again to the jacket separating in the rifle bore<sup>4</sup>.

Major Mathias, RAMC, who inspected the battlefield after Omdurman, observed a young man, who had been struck twice by a Mark IV bullet,

*He had a bullet wound of the left leg above the knee. The wound entrance was clean cut and very small. The projectile had struck the Femur, just above the internal condyle; the whole of the lower end of this bone, and upper end of the Tibia, were shattered to pieces, the knee joint being completely disorganised.*

*He had also been wounded in the right shoulder... The whole of the shoulder joint and scapular were shattered to pieces. In neither case was there any sign of a wound of exit<sup>12</sup>.*

The Mark II\* and Mark IV rounds were considered by other world powers, predominantly Germany<sup>15</sup> and some Irish MPs in the House of Commons<sup>8</sup>, to be inhumane and should be banned. In 1898, Professor von Bruns, of Tübingen in Germany, published a work

titled, 'The Effects of Lead-Pointed Bullets (Dum-Dum Bullets)'<sup>16</sup>. His experiments were flawed as there were no control experiments, the word 'explosive' was used to describe the effect of the bullets when they contained no explosive, and the tests were not done using British Military Bullets but with modified German military bullets and soft point hunting projectiles<sup>16</sup>. It was believed the paper was written to promote his desire to have these projectiles excluded from civilised warfare by international agreement<sup>16</sup>.

Ogston, in Britain, did a series of experiments on cadavers with the Mark 2, 2\* and IV, and Mauser Game bullets to compare their effects<sup>17</sup>. He admits that the experiments are difficult to do as it hard to hit the same part on different bodies and the peculiarities of the bullet must be taken into account. His results bring Von Brun's experimental results into question and one wonders on the political bias on both experiments. It was at this time that the Hague Convention was coming to an end.

The Peace Conference's or the Hague Convention's Final Act, as published in 'The Times' on 1 August 1899, was a document designed to maintain the general peace, unite the members of civilised nations and extend the reign of international justice<sup>18</sup>, and is called the 'Hague Convention'. The Third Declaration prohibited contracting parties (including Britain), 'from making use of bullets which expand or flatten easily in the human body'<sup>18</sup>.

In 1899, the Lancet published an article titled 'Modern Military Bullets: A study of Their Destructive Effects', where cadavers and bars of soap, were again shot to compare current British and German military rifle bullets<sup>19</sup>. This was of significance as the Boer War started on 11 October 1899<sup>20</sup> and the Boers were supplied rifles by Germany<sup>21</sup>.

The use of Mark IV & V ammunition in South Africa by the British Forces and soft point ammunition by the Boers is always one of conjecture. The British Government sent an order to the General Officer Commanding South Africa in July 1899, that only Mark II ammunition was to be issued on mobilisation<sup>22</sup>. This was reinforced after the outbreak of war that all hollow point ammunition was to be returned to England<sup>22</sup>. The Boers used a number of different military rifles as well as hunting rifles<sup>21</sup>, and battlefield recovery has shown the use of both Mark IV by the British Forces and soft point ammunition by the Boer Forces<sup>6,21</sup>.

The Cordite Mark V round, identical to the Mark IV round apart from the addition of 2% antimony to the lead core and an additional 1.3 mm in length, was issued in October 1899<sup>4</sup>. It was controversial from the start as it violated the Hague Convention. The round was soon withdrawn from service and replaced with the Mark II in the interim until the Mark VI came into service in 1904, with this round being almost a replica of the Mark II<sup>4</sup>. The Mark V was reissued, as a limited production, into service in Somaliland where the British forces were up against the forces of the 'Mad Mullah'<sup>22</sup>. It is interesting to note that the use of Mark 2\*, III, IV & V ammunition was only acceptable against savages and not Europeans<sup>9,12,22,23</sup>.

### Later Rounds

The Mark VI was the standard round from January 1904 and was identical to the Mark II bullet except for a slightly thinner jacket. The Mark VI was only an interim measure until a more effective round could be made that was in accordance with the Hague Convention. This was the Mark VII round<sup>4</sup>. Australia produced the Mk VI round from 1904<sup>5</sup> until January 1918, when it changed to Mark VII ammunition<sup>6</sup>. Australian Forces at Gallipoli and the Middle East<sup>6</sup> used Mark VI ammunition, but not on the Western Front where the British Forces standard round for all forces was the Mark VII<sup>24</sup>.

The Mark VII issued in November 1910 became the standard .303 round thereafter, although a Mark VIII round was issued from 1938 for use in Vickers Machine Guns<sup>4</sup>. The Mark VII round was of unusual design for the time as it had a dual core of aluminium in the nose and lead in the rear. It was also the first British military round to have a spitzer or pointed tip<sup>4</sup>.

With a pointed bullet, the centre of gravity is at the rear of the projectile and, with a lighter nose, more so<sup>12</sup>. A slight deflection of the tip, such as entering the body and striking hard tissue, will cause the rear of the bullet to rotate on its transverse axis or tumble<sup>25</sup>. Experiments on recently killed sheep and horses in 1911 showed that bullet tumbled in 63% of the wounds<sup>12</sup>. A German surgeon seeing wounds inflicted by British rifle ammunition in 1914 remarked upon similar results<sup>26</sup>. It was also noted that the bullet broke up and the cores separated, causing an 'explosive action', and he suspected that the sometimes the tips were being broken off before firing by soldiers<sup>26</sup>. This could be achieved by breaking them off in a hole in the action and the author has been able to do this.

The cores were not always made of aluminium, as it was a strategic material and could be used to make aircraft instead of bullets, so other materials were chosen<sup>4</sup>. In WWI, the British used pressed cardboard<sup>27</sup> and in WWII pressed cardboard and plastic<sup>5</sup>. In WWII Australia used red plastic<sup>27</sup>.

### CONCLUSION

The .303 round went through many changes in its first 20 years of production. It went from black powder to smokeless powder, boxer to berdan priming and from full metal jacket projectiles with a lead core, to soft points, hollow points and then to a dual core round. Lethality was a big issue with these rounds, and was politically sensitive from 1895-1905.

The round was the mainstay of the British Empire through many conflicts, and on a television report of a supposed aircraft hijacking in India on 4 October 2001, there were police or military at the airport armed with .303 rifles. Not bad for a cartridge originally designed over 110 years ago.

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