The cover picture
A sketch of the action of the original type of Gehendra rifle made by John Walter during research for the book: “Guns of the Gurkhas”.

Advice to authors
The HBSA Journal is published annually and welcomes contributions on topics concerning breechloading arms from the 18th century onwards, covering developments in smallarms technology, ammunition, sights and accoutrements.

Short articles of a few hundred words can be published, and major works should not normally exceed 12,000 words. Manuscripts should be sent to the editor electronically, with text and illustrations separately.

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Authors are requested to contact the editor (journal.editor@hbsa-uk.org) before submitting a manuscript.
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The Martini Henry

The Martini Henry rifle was adopted by the British army in 1874, the pattern for the Mark I being sealed on 17th July of that year, it remained its standard until it was replaced by the Lee Metford rifle in 1888. The Martini Henry rifle emerged from extensive trials conducted by the British army in the late 1860s which compared, inter alia, examples of a wide variety of breech designs including the tilting block action of Friedrich von Martini and the dropping block coupled with the seven-grooved rifling of Alexander Henry. These two elements impressed the evaluating committee sufficiently to call for them to be incorporated into the single rifle that now bears the composite name.

When introduced, the Martini Henry was at the forefront of developments during a period of rapid progress in firearms technology. It combined a distinctive action with a large coiled brass cartridge case, later changed to a bottle neck design, loaded with 85 grains of black powder and driving a 480 grain .450 calibre bullet. All of these underwent change during its seventeen years in official service, and beyond. Drawn brass cartridges were soon found simpler, as well as more reliable and equally effective. There were many substantial changes made during its front line life which resulted in Martini Henrys Marks I-IV being now recognised, plus a number of less significant changes along the way designated as the various patterns. Beyond its withdrawal as the British Army’s front line rifle, in 1890 models in .303 calibre, sometimes known as Marks 5 and 6, were approved, intended mainly for use in the colonies. The use of the smaller bullet and smokeless propellants were also implemented, which answered the complaints of excessive recoil which had been common with .450 calibre rifles. Developments also continued in its reserve status, and 1902 saw approval of a cordite load for the .450 cartridge using the same 480 grain bullet.

By the time of the Martini Henry’s replacement, smaller calibre multi shot rifles, with drawn brass cartridge cases and smokeless propellants were the norm. However the Martini Henry had an enduring popularity that long outlasted its replacement in the British army, and its service use continued in parts of the British Empire into the 20th century. In the late 19th century foreign powers, notably Turkey and the Boer Republic as well as others, used the basic design chambering the rifle for their ammunition, and it was widely copied by native craftsmen, perhaps even until the 1940s.

Beyond its military use, the Martini Henry also had a considerable civilian following, partly in respect of the suitability of its large cartridge for big game hunting. This, along with the strong innovative lock mechanism of the rifle, resulted in the Martini design being chambered for a wide range of calibres. The action was popular target rifles and the design was also used as a general purpose shot gun. This G P gun, as it was referred to, was in production until the 1970s. The Martini Henry action has also been used for a number of exceptional purposes, such as the powering of a life saving device for ships. It also has a claim to fame in being mentioned in a poem by Rudyard Kipling, and it played a star role in Stanley Baker’s 1964 film “Zulu”, depicting the battle of Rorke’s Drift in 1879.

The Journal’s current issue contains three articles touching on different aspects of the Martini Henry. In the first, Dave Thombs analyses the original trials by the British Army which led to the eventual adoption of the rifle. In the second, Marcus Ray describes the copying of the rifle in less developed circumstances where the lock’s coil spring could not readily be reproduced. Finally, Ted Bradstreet describes one commercial manufacturer’s modification of the mechanism and how it subsequently fared.

Editor
Early military breechloading rifle precision

by David Thombs

Abstract
The results of four sets of national trials of early breechloading military rifles are analysed from contemporary records. The precision obtained from all the competitors is expressed in terms of practical performance on a Figure 11 charging man target. Conclusions are drawn regarding absolute levels of precision and precision relative to the preceding generation of small bore military muzzleloaders.

Introduction
Thombs and Barrett writing in the HBSA Journal observed that the .43 Spanish Remington Rolling-Block suffered from very poor precision and that changes in Infantry tactics after its adoption required modifications to be made to improve its performance. However, it is noted that contributors, in particular to Internet sites, often claim to obtain good “accuracy” from military rifles of the period. For example: ‘My .43 Spanish 1871 Remington rolling block military musket is still one of the most accurate rifles in my collection. I just wish it wasn’t so damned expensive to shoot!!!’

The purpose of this paper is to examine contemporary records, in particular acceptance trials results, to determine the level of precision obtained under controlled conditions and compare the military rifles and ammunition available in the late 1860s and early 1870s. This paper will not examine the data available for target rifles, although this would make a most interesting study.

Military Rifle Selection
The selection of a rifle for military use is not a trivial task. In many cases a specification is issued and bids are invited from prospective arms manufacturers. The level of detail in the specification can vary and sometimes the attributes specified can be contradictory. The following list of attributes is typical but not complete:

- Maximum weight
- Maximum length
- Maximum ammunition weight
- Maximum recoil
- Rough usage e.g. resistance to sand and water
- Rate of fire
- Accuracy
- Trajectory
- Penetration
- Fouling

In current procurement practice, the system is formalised and each of the attributes is given a weighting. Trials take
place and performance is measured for each attribute. Scores are then aggregated to produce the winner. This approach is not foolproof and is sensitive to the weighting given to each attribute. For example if accuracy is weighted very highly, a delicate target rifle could be the winner.

In the past the choice of rifle tended to be made on a more informal view of performance against attributes. Temple and Skennerton note on p.6, the following discussion regarding the setting up of the trials which resulted in the eventual adoption of the Martini-Henry:

“Several expressed the opinion, particularly...and Westley Richards, that it should be distinctly stated beforehand what was required and a scale of qualifications laid down. The committee objected strongly to this, as they felt it would be practically impossible to assign marks satisfactorily to different qualities, and that if they did so it would not necessarily follow that the arm which got the most marks would be the best. The system would involve a pedantic appearance of rigid comparison without superseding the necessity for an intelligent judgement to weigh the results, and if judgement was required it could be exercised without recourse to numerical values. Earl de Grey had decided this after an earlier representation from Westley Richards to the same effect.” a,b

Accuracy and precision
In common usage the terms accuracy and precision are often confused, especially in the firearms literature. The Ballistipedia web site provides a very useful, accurate and detailed description of firearms precision measurement and theory. I will quote liberally from this very useful source.

Accuracy refers to how well shot groups are centred on a target, and is essentially a problem of sighting-in a shooting system.

Precision describes dispersion about the group centre point, and is independent of accuracy. i.e., accuracy is dialled in. But you can’t just dial more precision into a point, and is independent of accuracy. i.e., accuracy is the Spanish trials resulting in the adoption of the M1871

In the Memorial de Artilleria 7 of 1888 records the results of the Spanish Remington rolling-block in .43 Spanish. (Will be referred to as M1871 in the rest of the paper).

Memorial de Artilleria 7 of 1888 records the results of the Freyre and Brull modifications to the M1871 resulting in the M1871/89 Reformado rifle and cartridge. (Will be referred to as M1871/89 in the rest of the paper).

Ordnance Memoranda No.15 8 reports the results of the United States trials of breechloading muskets and carbines from 1872-1873, resulting in the adoption of the Springfield in .45 calibre. Like the earlier British trials, breech and barrels trials were conducted separately.

Part 3 of this Memoranda gives a report on the “Proper calibre for small-arms”. (Will be referred to as Springfield in the rest of the paper). The report concluded that “The performance (of the Experimental .40, .52 and .45) is not superior in accuracy to the service ammunition, calibre .50”, though the flatness of the trajectory is, of course, greater for 500 yards, the charge being heavier and the bullet lighter”.

Measures of dispersion
Unfortunately the measurement of group sizes is fraught with problems and is statistically non trivial. A number of measures can be used, most of which are unsatisfactory and subject to a number of implicit assumptions. For a discussion of the statistical aspects see Ballistipedia. The following measures are most commonly used:

Mean radius
- Circular error probable (radius of the circle that includes 50% of the shots - “CEP(50)”)
- Horizontal and Vertical standard deviation
- Radial standard deviation
- Diagonal
- Figure of Merit (it should be noted that FOM has different meanings in the US and UK)
- Covering circle radius
- Extreme spread

Measures used in the data sources
- MH for both the first and second competitions gave mean radial deviation in feet at 300, 500, 800 and 1000 yards. Four rifles / barrels were used and 20 shots were fired at each range.
- M1871 gave mean radial deviation in millimetres at 200, 500, 800 and 970 metres. One rifle was used and 20 shots fired.
- M1871/89 gave CEP(50) in metres at 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100 and 1200 metres. One M1871 rifle and four M1871/89 rifles were used. 30 shots were fired.
- Springfield gave mean radial deviation in inches at 500, 800 and 1050 yards. Two of each foreign rifles used. 20 shots fired.

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a This bears comparison with Professor Richard Feynman’s comments while sitting on the Space Shuttle disaster enquiry that engineering judgement consisted of making up the numbers.
b The Westley Richards was tested with his own breech mechanism and two Enfield barrels were fitted to the Snider breech.

4
Comparison of the results obtained

Direct comparison of the results is non-trivial. But for the purposes of this paper a number of assumptions will be made:

- The shot dispersion data are normally distributed and has a similar distribution in both the vertical and horizontal axes. (This implies that the mean is equal to the median of the distribution and hence the mean radial deviation is equal to CEP(50)).

- All shots are accurately recorded and measured.

- Shooting conditions are similar e.g. low cross wind, use of rests, skill levels etc..

- Undue ‘political influences’ are not present.

All data have been converted to angular size MOA (minutes of arc), where 1 MOA represents 1.047 inches at 100 yards. Converting the Radial Mean Deviation (CEP) to a practical, meaningful, measure is non-trivial\[10\]. For the purposes of this paper, simply multiplying the average CEP by 1.825\[11\] will give the approximate radius of the circle in MOA which will contain 90% of the shots fired. It is then a simple matter to calculate the maximum range, (rounded to the nearest 10 yards), at which 9 out of 10 shots will hit a Figure 11 charging man target (size 45 inches by 17.5 inches; “Fig. 11 Range”). The results of these calculations are shown in Tables 2-5, along with, for purposes of comparison, those for the results of the 1862 trials of small bore muzzleloaders\[12\] (Table 6).

Rifles, barrels and cartridges tested

The rifles, barrels and cartridges that were tested in the above trials are shown in table 1.

<table>
<thead>
<tr>
<th>Rifles, barrels and cartridges tested</th>
<th>300 yards</th>
<th>500 yards</th>
<th>800 yards</th>
<th>1000 yards</th>
<th>Fig. 11 Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albini &amp; Braendlin</td>
<td>2.64</td>
<td>3.51</td>
<td>4.96</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>Burton I</td>
<td>2.91</td>
<td>3.49</td>
<td>7.49</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Burton II</td>
<td>2.41</td>
<td>2.91</td>
<td>4.50</td>
<td>6.61</td>
<td>110</td>
</tr>
<tr>
<td>Fosbery</td>
<td>4.70</td>
<td>3.23</td>
<td>3.41</td>
<td>3.95</td>
<td>130</td>
</tr>
<tr>
<td>Henry</td>
<td>6.65</td>
<td>3.25</td>
<td>3.23</td>
<td>3.41</td>
<td>130</td>
</tr>
<tr>
<td>Joslyn</td>
<td>4.43</td>
<td>4.61</td>
<td>5.79</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Peabody</td>
<td>6.38</td>
<td>6.03</td>
<td>6.03</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Snider navy</td>
<td>2.86</td>
<td>3.14</td>
<td>5.39</td>
<td>7.93</td>
<td>120</td>
</tr>
</tbody>
</table>

Table 2. Radial Mean Deviations in MOA for MH1

<table>
<thead>
<tr>
<th>Barrel</th>
<th>300 yards</th>
<th>500 yards</th>
<th>800 yards</th>
<th>1000 yards</th>
<th>Fig. 11 Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enfield</td>
<td>2.24</td>
<td>2.64</td>
<td>3.55</td>
<td>4.69</td>
<td>140</td>
</tr>
<tr>
<td>Henry</td>
<td>2.29</td>
<td>2.34</td>
<td>3.18</td>
<td>4.32</td>
<td>150</td>
</tr>
<tr>
<td>Lancaster</td>
<td>2.47</td>
<td>3.07</td>
<td>5.26</td>
<td>130</td>
<td></td>
</tr>
<tr>
<td>Rigby</td>
<td>5.36</td>
<td>5.36</td>
<td>5.36</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Snider</td>
<td>2.26</td>
<td>2.53</td>
<td>3.92</td>
<td>5.07</td>
<td>130</td>
</tr>
<tr>
<td>Westley Richards</td>
<td>4.03</td>
<td>4.03</td>
<td>4.03</td>
<td>110</td>
<td></td>
</tr>
<tr>
<td>Whitworth</td>
<td>2.30</td>
<td>2.85</td>
<td>4.81</td>
<td>140</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Radial Mean Deviation in MOA for MH2
As well as the official trials, some precision data are available from unofficial trials. In 1869 an unofficial trial, held at the Royal Arsenal Woolwich, was reported in the Proceedings of the Royal Artillery Institution 13, comparing the Martini-Henry and Chassepot. Twenty shots were fired from three rifles of each type at 500 yards. The average Radial Mean Deviations in MOA were recorded as 2.62 and 6.28 for the Martini-Henry and Chassepot respectively. The maximum range for 9/10 hits on the Figure 11 targets are 180 and 70 yards respectively. Majendie and Browne report 14, without reference to the primary source but writing as Assistant Superintendent and Captain Instructor at the Royal Laboratory, reported the following results (Table 7) for the Martini-Henry:

As a footnote on the same page they also report even better groups but fail to specify the range.

The British trials resulting in the adoption of the Martini-Henry required precision equating to a Figure 11 target range of 240 yards. For comparison, .303 Mk. 7 ammunition proof would equate to 360 yards.

### Observations

The precision of all of the rifles in the trials fell well short of the precision obtained with the last generation of small bore military muzzleloaders. In many cases the precision obtained was very poor, falling in the 50-100 yard range for 9 out of 10 hits on a Figure 11 target.

The Henry barrel used in the Martini-Henry proved to be the best in the MH1 and MH2 trials (130 and 150 yards) but performed much better in the Springfield trials and the Majendie and Browne report (190 yards in both cases) and also achieved 180 yards in the trial against the Chassepot. This however is still short of the 240 yards specified in the requirements for the MH1 and MH2 trials. In the case of the Springfield trials it equalled the precision obtained with the US Service .50. It is interesting to note the very poor performance of the Martini-Henry in the M1871 Spanish trials (80 yards).

The Spanish trials resulting in the adoption of the M1871 Remington Rolling block, and the later trials resulting in the M1871/89 Reformado are of particular interest. The performance of all the rifles in the first trial was poor and in the case of three rifles identical. However, since Spain adopted the M1871 and then found it to be unsatisfactory in terms of precision, it does imply, that in practice, the precision was even worse than the 80 yard figure suggests. In the trials resulting in the adoption of the M1871/89, the M1871 achieved the astounding bad results of 20 yards for 9 out of 10 hits on a Figure 11 target. Figure 1 shows targets shot at 200 metres by the M1871 in the 1871 and 1888 trials to the same scale. It should be noted that the result is even worse than it appears since the M1871 only managed 23 hits out of 30 shots on the 3 metre square target in the 1888 trial. Interestingly, the M1871/89 is only marginally

### Table 6. Radial Mean Deviation in MOA for Ordnance Select Committee data of 1862

<table>
<thead>
<tr>
<th>Rifle</th>
<th>300 metres</th>
<th>500 metres</th>
<th>800 metres</th>
<th>1100 metres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Enfield .577, 78&quot;</td>
<td>2.86</td>
<td>3.21</td>
<td>3.46</td>
<td>5.69</td>
</tr>
<tr>
<td>Enfield .577, 48&quot;</td>
<td>2.86</td>
<td>3.21</td>
<td>3.46</td>
<td>5.69</td>
</tr>
<tr>
<td>Enfield .45</td>
<td>1.48</td>
<td>1.88</td>
<td>2.15</td>
<td>2.42</td>
</tr>
<tr>
<td>Lancaster .45</td>
<td>3.20</td>
<td>3.36</td>
<td>3.38</td>
<td>3.65</td>
</tr>
<tr>
<td>Whitworth .45</td>
<td>1.23</td>
<td>1.57</td>
<td>2.10</td>
<td>2.79</td>
</tr>
<tr>
<td>Westley Richards, breechloading .45</td>
<td>1.58</td>
<td>2.12</td>
<td>2.42</td>
<td>2.73</td>
</tr>
</tbody>
</table>

* Shot at 1000 metres

### Table 7. Radial Mean Deviation in MOA for Martini Henry

<table>
<thead>
<tr>
<th>Range in yards</th>
<th>Average of 5 targets of 20 shots each</th>
<th>The best of the 5 targets at each range</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>2.18</td>
<td>1.80</td>
</tr>
<tr>
<td>500</td>
<td>2.18</td>
<td>1.81</td>
</tr>
<tr>
<td>800</td>
<td>2.34</td>
<td>1.85</td>
</tr>
<tr>
<td>1000</td>
<td>3.21</td>
<td>2.51</td>
</tr>
<tr>
<td>1200</td>
<td>3.30</td>
<td>2.18</td>
</tr>
<tr>
<td>Fig. 11 Range</td>
<td>190</td>
<td>230</td>
</tr>
</tbody>
</table>
better than the results obtained for the M1871 in the earlier trials (80 vs. 100 yards).

Conclusions
Using the limited data set available, it is concluded that the precision of many early military breechloaders was poor, and even the best were inferior to the last generation of small bore muzzleloaders.

The best precision was shown by the Martini-Henry and the US Service .50.

The Spanish M1871 trial results are anomalous and suggest others factors may have been at work. It is not known why the M1871 .43 Spanish rifle / cartridge combination was so poor.

Opportunities for further work
Precision data from trials in other countries would help to better understand the precision obtained from early breechloading military rifles.

Modern trials using 1860/70 era rifles and ammunition made to military standards, firing groups of 20 shots at say 100 or 200 yards would help our understanding of the results of the early trials.

The results of the Spanish trials are anomalous and should repay further study. The excellent Spanish Defence Ministry digital library has all the documents dealing with the trials on-line, including minutes of all the meetings.

References


5. Special Committee on breech loading rifles; report, Supp 5/890, (1868-1869), National Archives, Kew.


9. Ibid.


13. Trial of Improved Chassepot fired in comparison with the Martini-Henry Arm for accuracy at 500 yards range, Proceedings Royal Artillery Institution, (1869), p. 79,80


15. Pall Mall Gazette, 30 July 1870. pp 4,5


Acknowledgement
Steve Barrett for many invaluable discussions, time spent in the National Archives and for tackling the ordering system in the British Library.
Nepalese arms manufacture and General Gehendra

by Marcus Ray

Nepal came to the attention of arms collectors in 2003 when Christian Cranmer purchased and exported a stockpile of over 430 tons of smallarms, cannon, mortars and bladed weapons, which were then offered for sale through International Military Antiques. Most of these weapons had been housed in the Palace Lagan Silekhana* in Kathmandu, Nepal. These included the long arm covered by this article, namely the late 19th century Gehendra rifle - a single shot tilting block rifle having considerable similarities with the Wesley Richards internal hammer tilting block single shot rifle.

The nation of Nepal in the late 19th century was very poor with 98% illiteracy. Most of the population led a feudal existence, subservient to a small wealthy ruling class which lived in elegance and splendour. A brief attempt at liberalisation in 1901, including programmes of reforms such as in education, ended after only four months with the overthrow of Prime Minister Deva Shamser by his younger brother Chandra Shamser Rana, who quickly returned to the status quo.

General Gehendra Shumsher Junga Rana Bahadur

General Gehendra Shumsher Junga Rana Bahadur (1871-1905, Figure 1), scientist and inventor, was thus an exceptional product of Nepal. He developed the Bira gun, named for his father Prime Minister Bir Shamser Rana, a two barrelled hand-cranked gun similar to the Gardener gun, as well as the Gehendra rifle, which was known in Nepal as either the Ge rifle after himself; the Dev or Deva rifle after his uncle Prime Minister Deva Shamser; or the Cha rifle named for Prime Minister Chandra Shamser Rana, his uncle. General Gehendra was the eldest son of then Prime Minister Bir Shamser Rana, and had a greatly innovative mind; he made attempts a constructing a wide variety of machines varying from automobiles to power generation equipment. His family was wealthy enough to afford him his own laboratories and factories at Jamal Kathmandu. The depth of his intellect seemed almost boundless; grain mills and even wind mills for pumping water sprang from his imagination, to be built and put into work. This, from a man whose life was cut short at only 35 years, amidst rumours of political intrigue.

Mechanised firearms manufacturing

Manufacture of firearms in Nepal had been by traditional artisanal methods until in the 1890s. At that time the government-produced military rifle was the Francotte variant of the Martini-Henry. This, as produced locally, was an unsatisfactory product liable to catastrophic failure in use. General Gehendra, at his own expense, introduced mechanised production for both arms and for ammunition. Although many of the manufacturing machines were imported from Britain, some were also

* Lagan Shilakhana translates as arsenal. The palace in Kathmandu used for the purpose at the time belonged to General Rana Bir Singh Thapa, younger brother of Army Commander In Chief Bhim Sen Thapa.
constructed locally. Although General Gehendra was subsequently stripped of authority, production of the Gehendra rifle continued.

Nine of the 19th century machine tools that were used for making arms and ammunition are displayed in the Nepalese Army Military Museum, Chhauni, Kathmandu Nepal (Figures 2 - 19). Most have display notices with text that translates as: “General Gehendra Shumsher Rana, a scientist and innovator, bought this machine from the United Kingdom in BS 1953 to manufacture weapons for his arsenal in Jamal, Kathmandu.”

Firearms manufacturing machines

After falling into disuse, the machines were removed and left in the open for many years at the Sundarijal Arsenal until salvaged by Dr. Prem Basnyat, founder and first curator of the Military Museum, Kathmandu, Nepal. Unfortunately, other than one being a lathe and another a roller mill, the precise purpose and function of most of these specialised machines are not immediately obvious. The manufacturing machine tools located in the Nepalese Army Museum compound all have similar display labels as shown in the illustrations.

By modern standards, some of these machines would be considered extremely unsafe. For example the rolling mill (Figure 7) has no safeguard against the possibility of clothing becoming trapped and drawn in to the rollers. There are no available records of industrial injuries.

* The national calendar of Nepal, the Bikram Sambat, is 57 years ahead of the Western calendar and is said to date from a victory by the emperor Vikramaditya in 56 BC. The year 1953 BS is equivalent to AD 1896.
Figure 7. A rolling mill for making flat sheet from bar stock, or possibly for producing thinner but wider bar stock. Turning the two rollers feeds the bar stock between them.

Figure 8. Museum signage painted on the machine in Figure 7 translates as: “General Gehendra Shumsher Rana a scientist and innovator bought this machine from the United Kingdom in BS 1953 to manufacture weapons for his arsenal in Jamal, Kathmandu.”

Figure 9. What appears to be a shaping or broaching machine. The plaque cast into the end of the machine (Figure 10) indicates that this is an indigenously made machine, cast and assumedly machined by the Nepalese.

Figure 10. A plaque cast into the machine in Figure 9 showing that Nepal was not only making arms and ammunition but also the equipment to manufacture them. The plaque reads: “Shree General Gehendra Shumsher Junga Rana Bahadur.”

Figure 11. Possibly a slotted or broaching machine for making keyways or some other type of internal square shoulder, of indigenous manufacture.

* Shree is a designation of rank in society; Shree1 being the lowest and equivalent to “Mister”.
Figure 12. This has the appearance of a die drawing machine to draw a brass slug through succeeding operations to a hollow elongated cylinder for cartridge brass for a .577-.450 round of ammunition. This photograph shows two square platforms with large square holes. The lower and best visible is for a bin or hopper for the finished brass to drop into from the machine. The second platform, above the first and on the side of the machine facing forward would be for the bin or tray for the raw blanks to feed the machine through the feed ramp angling up and forwards at the top of the machine. The feed ramp width shows the length of the blanks, which in this case would about fit a Martini Henry round that needed the shoulder and neck to be formed.

Figure 13. Museum signage displayed on the machine in Figure 12.

Figure 14. A stamping machine used to make .450/577 ammunition.

Figure 15. A machine which appears, and according to its label (Figure 16) to be a lathe, or perhaps an external grinder, which would explain the shield around the tail stock center on the right on top of the machine. The head stock, on the left top of the machine, seems to have a mandrel of some sort, perhaps fitting in a blanked out hole in a barrel breech.

Figure 16. Museum signage painted on the machine in Figure 15.

Figure 17. Despite its label (Figure 18), this has the appearance of a stamping machine rather than a boring machine.
The Gehendra rifle

Whilst the government of Nepal’s manufacturing plant originally made direct copies of Martini-Henry rifles, the reproduction of certain components, and particularly the coiled mainspring, proved difficult. Eventually a new design which circumvented these difficulties – that of the Gehendra rifle – was adopted. Following the return of Captain Bakhta Bahadur Basnyat from Japan, he made improvements to the rifle which included the redesigned main spring and relocated rear support screw.\(^4\)

Despite immediate similarities (Figure 20), the Gehendra rifle is readily distinguished from the Martini-Henry. One of the most obvious differences being the absence of a cocking indicator on the Gehendra. There is moreover the distinctive cocking lever with its elegant curves ending with the graceful swirling loop.

Operationally, the Gehendra functions exactly as a Martini-Henry. Pulling down the lever causes the breech block to tilt downwards at the front at the same time actuating the extractor which ejects the spent brass case. The same motion cocks the hammer which lies back against the sear held by the trigger. A fresh round is inserted, and the lever returned to its resting place against the butt stock, held in place by two tabs protruding downwards. Pulling the trigger releases the
hammer to be propelled forward by the main spring which then strikes the primer.

Internally however there are radical differences from the Martini-Henry (Figure 21). The cocking lever still lowers the breech block by means of two pawls at its end which engage in two cam slots in the breech block. Instead of this taking place at the rear of the breech block however, it is at the front, and the cocking lever extends forward of the trigger; also forming the trigger guard. Below the pawls is the hole for the retaining pin, slightly below and to the right of this is a 90 degree cutout in a protrusion; resembling an ear on a stylized horse head (Figures 22 - 24). This “ear” moves the hammer to the cocked position as the lever is lowered by making contact with the underside of a mating ear on the hammer. As this happens the bridle connecting the hammer to the main spring compresses the spring and the sear engages between the hammer and the trigger holding the hammer in place until the trigger is pulled. The cocking lever is then pulled down causing the breech block to drop and the spent case is extracted. A cartridge is placed in the breech and pushed forward with the thumb; whereupon the cocking lever is pulled back up against the stock and the breech closed. Pulling the trigger reverses the spring from compression to decompression propelling the hammer forward until the firing pin strikes the primer of the cartridge. Releasing the trigger allows the trigger spring to push the trigger back to its place against the hammer waiting for the weapon to be recocked and the sears to engage. When the cocking lever is lowered, the forward edge of the breech block presses down on the extractor causing it to pull the empty brass from the chamber. A new round can be inserted and the process repeated.

The 844mm (33 ½ inch) iron barrel results in an overall length of 1262mm (49 ¾ inch); to the barrel is attached the fore stock held on by two barrel bands and a cross pin much the same as the Mk II Martini Henry. The end cap is of iron and held in place by a screw. The sling swivels are located on the fore end barrel band and a peculiar arrangement of the rear sling swivel attached to the trigger plate inside the trigger guard. This sling bale is enlarged to keep the sling swivel from interfering with the operation of the cocking lever.

**Mechanism of action of the Gehendra rifle**

The disassembled mechanism of the Gehendra is shown in Figure 22. At the top of the figure is the breech block (A) and to its left are the various pins and screws that hold the mechanism together (B). Below the breech block is the mainspring (C) with the trigger spring (D) and trigger (E) underneath. Beneath these are the trigger plate (H) and cocking lever (I). To the right of the cocking lever is the rear sling bale (J). To the right of the trigger lie the hammer (F) and extractor (G).

Figures 23 and 24 show the cocking lever engaging the breech block in the closed (“in battery”), and open positions. In Figure 25 the main components are displayed with the hammer in the cocked position and the sear engaged, with close up details in Figure 26.

**Figure 21.** A Sketch of the action of the original type of Gehendra rifle made by John Walter for the book: “Guns of the Gurkhas” ³

**Figure 22.** Mechanism of the Gehendra disassembled.

**Figure 23.** The cocking lever engaging the breech block in the closed or “in battery” position.

**Figure 24.** The cocking lever engaging the breech block in the open position.
Figure 27 shows the articulation of the breechblock with the extractor component.

The Gehendra rifle can be considered the most successful of General Gehendra’s arms manufacturing enterprises and several thousand were made. Although it is not known whether it was used in action, production of the Gehendra did allow the Kingdom of Nepal to become self-sufficient in terms of production of an adequate military rifle at a time when many other small nations were entirely reliant on foreign imports.

References
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Acknowledgement
Figures 1-19 courtesy of Brigadier General Prem Basnyat PhD Army of Nepal.
William Tranter’s “Double Patent” Rifle Action

by T. E. Bradstreet

Abstract
From its first British trials appearance in 1867, the Martini action drew persistent negative publicity. Though mainly generated by competition and fear of the new, it made “improved Martini” rifle actions marketable. In 1869 and 1871, William Tranter filed two patents, 3557/69 and 2509/71, the bases of his “Double Patent Rifle.” An “improved Martini,” it had features typical of such actions, including a concealed hammer and flat springs. Tranter’s design also used several interesting original elements, however.

The most interesting and important patented feature was the long wide lower arm of its bellcrank extractor. The upper surface of this arm was a long-radius convex cylindrical cam which articulated with the similar but concave surface of the bottom of the breechblock. High extractor leverage was provided at action opening, progressively decreasing to a “smart” ejection.

A second patented element was an effective trigger-block safety consisting of a faceted bolt screwed through the receiver just in front of the trigger. At a right angle to its end, the bolt had a spring lever with an end detent which fell into depressions in the receiver’s outer surface; one being the fire position, the other marked “BOLTED”. The safety was removed by simply screwing it out.

Original unpatented linked features were a locking hammer and a captive firing pin. After firing, the hammer was locked fully forward by a reverse notch and sear while the trigger was pressed. This design supported the primer while under propellant gas pressure, preventing primer intrusion into the breechblock. The hammer, passing through a fitted slot in the head of the firing pin, controlled all firing pin movement. Before action opening, it positively drew the firing pin tip into the breechblock.

The “Double Patent Rifle” showed “much mechanical ingenuity and first-class manufacture” i.e., was complex and heavy. Nevertheless, a few were sold, in sporting form at least, as detailed in this article. Tranter, however, eventually returned to the lighter, simpler, and cheaper Martini for most of his single-shot sporting rifles.

Introduction
This article considers an example of British “tilting-block” sporting rifles. By “tilting-block,” we mean an action in which the rear end of the breechblock rotates around a fixed horizontal pin lying across the boreline. Only the front end of the breechblock moves relative to the receiver, tilting downward to open the breech and upward to close it. The purely descriptive term “tilting-block” has been adopted here for this general action form - of which the Martini is the most successful and well-known example - because the actual origin of the breech type is unclear. In recent times, all such actions have come to be called “Martini”. Although his firing mechanism was original, von Martini’s patent (2305/68 in England) could not claim this for the tilting breechblock of the Peabody action, which was the basis
of the Martini. While Henry O. Peabody’s US patent, 35,947 of 22 July 1862, had made prior use of the tilting breechblock, it specifically disclaimed it as original, implying still earlier use by persons unspecified.

The “Martini Effect”
The Martini action first appeared in England in 1867 in Swiss rimfire form at the Ordnance Select Committee breechloading rifle trials. Virtually all British tilting-block actions were designed and developed in the expectation that the Martini action would be chosen for British military service in the trials or subsequent to its selection and issue. Friedrich von Martini’s first patent in England was not filed until 1868 (2305/68); it described the familiar Martini action, probably to protect commercial production in the event of military adoption. The Martini action officially entered British service with the Mk I (first pattern) Martini-Henry rifle 3rd June 1871.

Five years later, on 9th June 1876, the Commons took up routine funding of British military “Supply, Manufacture, and Repair of Warlike and other Stores.” Baronet Sir Walter Barttelot CB, Conservative MP for West Sussex and notable Crimean War veteran, proposed reducing the recommended £1,229,000 by £85,000 on his argument that the Martini-Henry rifle was “not the best rifle” for service. He recited a litany of complaints leveled against the Martini-Henry since 1867. Discussion was brief: its seven participants included the Surveyor General of the Ordnance and the Secretary of State for War. They pointed out politely that virtually all the complaints, real or imaginary, had been long since addressed. Sir Walter deferred to the War Secretary, withdrew his amendment, but, in 1876, still held to his main objection to the Martini-Henry.

That objection was the foremost raised against the Martini action since first presented at trials; use of a coil mainspring in a “complicated and delicate” (which should perhaps be read as “unfamiliar”) action. To most of the British people, the Martini action was completely incomprehensible. For generations, doglock to Snider, a lock’s works had stayed the same, vee spring, tumbler, sear, and cock/hammer on a sideplate, with a trigger below to act on the sear. Now comes the Martini, no hammer at all, strange lock parts on the trigger-plate, a coil mainspring buried deep inside, no (reliable) safety – far removed from the concept of a gun!

The sheer unfamiliarity of the Martini action allowed its detractors to scare the public with many plausible horrors, from an unrepairable mainspring to unclearable jams. At first, rumor-mongering was simply counter-advertising, but the Martini action was designed from the outset for machine mass production. As realization grew that Government and private manufacturers increasingly were so producing military arms, the lifeblood of the Trade, competition became desperation. Over just three decades, 1856-86, the change would lead to the virtual extinction of traditional English small-shop parts-specialized arms manufacture. Beginning at least as early as 1868 and continuing into the late 1870s, a number of gunmakers, large and small, developed “improved Martini” actions intended to correct (exploit) the Martini’s “reported” ills.

William Tranter
William Tranter was a force to be reckoned with in the Birmingham Gun Trade. Three recent books and an active website are devoted to him. The books are all out of print and are mainly concerned with the vast array of revolvers made under the myriad patents his inventive mind produced over his long career 1839-85. The books do deal with his biography and longarm production, but hardly to the depth of the handguns. The website, The Firearms Technology Museum (www.firearmsmuseum.org.au), run by Kerry and Carol Guerin, NSW, Australia, is a more accessible source of information on Tranter.

William Tranter entered the trade in his own right with the acquisition of the business of Robert Dugard in 1839. He would become a member of the Birmingham Small Arms Trade association in 1854, and, in 1861, a founding member of the Birmingham Small Arms Co., Ltd. (BSA), holding a very respectable 45 of the original shares. Tranter continued off and on to find larger workspace by association with other makers until 1867, when he built his Aston Cross works for the machine manufacture of firearms. The first output from Aston Cross, before the factory was fully finished, was Chassepot rifles for the French government, and not any of his already famous revolvers. Tranter’s longarms production was considerable and varied, though largely military types under foreign or colonial contracts.

The “Improved Martini”
Like others of his time, Tranter designed a tilting-block action, for machine manufacture, expressly to improve on the Martini: this action he called the “Double Patent Rifle” action. Tranter made a very few sporting and, reportedly, military rifles on the action, having advertised it for both purposes. He addressed what had been touted as important weaknesses of the Martini action: e.g., substituting a vee mainspring with hammer for the Martini coil with striker, providing stronger extraction and a reliable safety. An underlever operated tilting-block, the action still superficially resembled the Martini.

Guerin has cataloged just four genuine sporting specimens using this action, one a derelic frame, over-engraved in India with motifs unmistakably hostile to the Raj. A well-published candidate specimen, built up as a military rifle in .303” after 1909, may not use an actual “Double Patent” action (discussed below). From the rarity of specimens, the Double Patent action cannot be considered a success. In 1873, Captain J. B. O’Hea said, very politely, that it “bears the stamp of much mechanical ingenuity and first-class manufacture”; i.e., it was overly complex and too heavy, as confirmed by inspection. We include it in our series because it was British, tilting-block, built into sporting rifles, ingenious indeed, and, to judge from the specimen known to us, it could endure long and rough use.

The Patents
Two English patents issued to William Tranter apply, 3557/69, of 9th December 1869, and 2509/71, of 23rd September 1871, thus the “Double Patent” sobriquet. Patent 3557/69 was voided on 15th December 1876 by non-payment of the £100 seventh-year Stamp Duty,
though the third-year £50 Stamp Duty had been paid on 5th December 1872. When the third-year Stamp Duty came due on 2509/71, that patent was allowed to lapse on 2nd October 1874. Allowing a patent to be voided by non-payment of the Stamp Duty typically indicated a lack of commercial interest in the design. In this case, it reveals that Tranter’s “Double Patent Rifle” action manufacture was most likely abandoned by the autumn of 1874 as unprofitable, though actions seemingly were used from old stock at later dates.

English patents of the nineteenth century vary considerably in their level of explicitness. Some are simple, direct, and to the point. Others obfuscate, using complexity, broadness, and indirect language, particularly hiding their actual methods in “may be” and “or other” phrases. William Tranter preferred the latter style. His patent 3557/69 describes “improvements” applicable to tilting-block and sliding-block rifle actions, revolvers, and tilt-barrel pistols. There are 21 “may be” or similar phrases in the specification of 3557/69 before the text arrives at the description of the drawings. There are ten claims, seven of which apply to the tilting-block action. Several of those arise from the “may be” phrases. The patent presents but one lengthwise cross section of the rifle action, showing a selection of features from the smörgåsbord of possibilities. It does not match well with any section in 2509/71. If one assumes that an action built under 3557/69 resembled its FIG. 1, a great deal of change would be required to develop a “Double Patent” rifle.

Patent 2509/71 illustrates two rifle actions, however. FIG. 1 (Figure 1 bottom) is the patent fully realized, but FIGs. 3 through 12 are representations of a rifle stated in the text of 2509/71 to have been made under 3557/69. FIGs. 3 and 7 of 2509/71 (Figure 2 top and bottom) show lengthwise representations of that action, closely resembling that of known Double Patent rifle specimens. A feature from the 1869 patent absent from the 1871 drawings is a bolt of any form securing the front of the action floorplate to the receiver ring.

The remaining 2509/71 drawings FIGs. 4 to 6 and 8 to 12 in the patent, show the features explicitly added to 3557/69 as specified and claimed in 2509/71. These four features, individually claimed in 2509/71, are:

Claim 2. A safety “bolt” (Figure 2 top);

Claim 3. A cocking indicator (Figure 2 bottom);

Claim 4. A spring claw on the outer end of the operating lever, which snaps over the rear end of the floorplate to hold the action closed (Figure 2 both);

Claim 5. An extended lower arm on the extractor (Figure 2 both).

The last of this list as applied to the “1869 rifle” in FIG. 3 of 2509/71 (Figure 2 top) is of particular note. Jamming by failure to extract had been an early problem for the Martini action. The “Double Patent” extractor (indicated by an arrow in Figure 2 and part No. 1 in Figure 3), otherwise a typical bellcrank in form, had its lower arm extended rearward with a long-radius convex cylindrical cam upper surface. This revised extractor lower arm is central to Tranter’s principle of “progressive extraction leverage,” in which extraction leverage is highest for primary extraction. Unfortunately, early Martini extraction failures were actually due to copper-case (Daw patent) ammunition and increased primary extraction leverage would tear the cartridge even more certainly. Even Boxer patent coiled-case ammunition would be prone to loss of the separately attached rim.

In Tranter’s progressive-extraction system, highest extraction leverage occurs just after the breechblock opens and its bottom, a very-long-radius concave cylindrical cam, contacts the extreme end of the long-radius convex
cylindrical cam upper surface of the extractor arm (just before C, Figure 3). This highest leverage is used for “primary extraction,” breaking the cartridge case free of the chamber wall. As the breechblock swings downward, its contact point on the extractor arm moves smoothly forward, continually decreasing leverage while finishing “secondary extraction,” withdrawing the loosened cartridge from the chamber. “Ejection,” expelling the cartridge from the action, occurs when the lower front corner of the breechblock strikes the lower extractor arm nearest the extractor pivot point (D, Figure 3), generating lowest leverage but highest angular velocity.

The Broadsheet
An undated broadsheet (Figure 4) shows a cross section of the action as advertised (Figure 5). The broadsheet refers to the arm as the “Double Patent Rifle,” implying that two patents were involved; only 3557/69 and 2509/71, the latter expressly improving upon the former, meet that description. As expected, FIGs. 3 and 7 of 2509/71 (Figure 2) very strongly resemble the broadsheet gun, except that the FIG. 7 illustrates a cocking indicator not mentioned in the broadsheet.

The broadsheet cross section (Figure 5) shows no sling swivel, but the front end of the floorplate still appears to be connected to the receiver ring by a bolt. The broadsheet text also speaks of turning and unscrewing a “safety bolt.” However, no such safety is shown in the broadsheet section. The lower nose of the mainspring appears to form a detent for a sliding trigger-block safety, necessitating a separate trigger spring. Sliding trigger-block safeties were generally unreliable in tilting-block actions because total trigger movement was so small. The rotating “safety bolt” of 2509/71 and the broadsheet text was clearly an attempt to improve on this situation.

The Locking Hammer
A remarkable feature, not claimed in either patent, is shown in 3557/69 and all later cross sections. It is described in the broadsheet thus: “The trigger of the lock bolts (locks) the striker (hammer) and striking (firing) pin at the time of firing, thereby preventing a portion of the cap being blown back into the striking pin hole of the breech-block, to interfere with the action of the Gun, as soon as the finger is removed from the trigger, it is unbolted.” Diagrammed in Figure 6, it consists of a hammer notch, C, and trigger seat, D, reversed to their normal correspondents, A and B. When the action is cocked, the trigger engages the hammer as usual by sear B falling into notch A. When the trigger is pulled and held back, sear B releases notch A, and the hammer falls, as expected.

However, when the hammer reaches the fully fired position, the reverse hammer notch C passes and is engaged by reverse trigger seat D, locking the hammer and firing pin forward as long as the trigger remains pulled. In this
position, the firing pin seals the breechblock face against blown or otherwise damaged primers. Once the finger is lifted from the trigger, the trigger spring forces the trigger forward to its original position. Sear D then releases notch C, and the hammer is unlocked for cocking to start.

The Captive Firing Pin
This is “the stamp of much mechanical ingenuity…” A feature requiring unstinted patience during both disassembly and assembly, but an essential partner to the locking hammer, is an unsprung captive firing pin (2, Figure 7). The head of the firing pin is a rigid stirrup fitting closely over the head of the hammer (1, Figure 7), linking the two. In cocking, the upper tip of the action lever (not visible in Figure 7) pushes first on the notch in the downward extension of the firing pin and then on those of the breechblock bushing (3, Figure 7) by which the lever will move the breechblock (4, wide diagonal ruling, Figure 7). Before movement of the operating lever cocks the hammer or opens the breech, it has mechanically retracted the firing pin tip into the breechblock face, freeing the breechblock to be opened.

The Specimens
Photographs of varying quality exist for a military-style rifle (Figure 8), built on a Tranter action, discussed in Berk4, Stewart2, and elsewhere. It was built by W. Palmer Jones around the time of the First World War on an in-the-white action, serial number 75, believed purchased at the dissolution auction of the Tranter family estate in 1909, long after William Tranter’s death. The Jones rifle is fully stocked and in .303” calibre. The base of the middle sling swivel, as in 3557/69, is a bolt securing the floorplate front to the receiver ring and there is no “safety bolt.” Presence of the bolt contrasts with patent 2509/71 and the recorded sporting rifles, and all those have the safety. These very limited observations show a marked kinship of the Jones action with the 1869 patent. On the other hand, it does have a straight floorplate with three horizontal retaining screws (“pins,” Figure 9), consistent with later “Double Patent” actions.

The broadsheet speaks of “three pins” securing the action floorplate, but does not show them clearly. Comparison of photographs of the Jones and Watson rifles and the “Indian” hulk (Figure 9 and described below), shows three screws through the receivers at locations analogous to those of the floorplate pins/screws of FIGs. 3 and 7 of the 2509/71 drawing (Figure 2).

The rear “pin” appears to serve no purpose except providing additional stiffness (and testing of perseverance). It has been suggested as an aid in assembly-disassembly, but broadsheet instructions treat all three the same. In the “three-pin” straight, rather than curved, floorplate, and in mounting the buttstock by means of a throughbolt (neither a claim of either patent), all these “Double Patent” rifles differ from 3557/69.

The Double Patent sporting rifle we examined (Figure 10) is a “Cape” pattern lady’s or boy’s rifle – i.e. the pattern popular in South Africa with elaborate flush (no standing leaf) rear sights in a military calibre. Overall length of the rifle is 45” and length of pull is 13½”, over an inch short for an adult male at the time. Comparison with contemporary Watson rifles makes clear that the buttstock of this rifle was shortened from its action end by truncating Watson’s usual long graceful wrist, as shown by the checkering. The original cavity for the action-lever detent now is mostly covered by the lower tang. Also, the comb has been rudely lowered for the smaller user (Figure 11). Watson’s stock was further insulted by a wide, shallow Vernier sight dovetail cut along the top of the wrist.

Buttstock shortening resulted in poor fit of the stock bolt, including over-extension into the action, and in damage to the wood where it meets the action. Interestingly, the heavy 11/16-inch diameter screw head
of the stock bolt, suitably engraved, is exposed in a tightly fitted opening in the centre of the buttplate. It has been worn unevenly from its altered exposure, an indication that the butt angle has also been changed and the buttplate tipped, its toe shortened. The horn capped forewood is secured by a prosaic captive key passing through matching escutcheons. The rifle weighs a solid 8 lb. 5 oz., perhaps 1½ lb. more than a comparable Martini. This weight, not unexpected in a “Cape” rifle, helped to manage recoil but was tiring to handle.

The rifle is evidently chambered for the .577/.450 Martini-Henry carbine cartridge; a military-standard rifle cartridge does not chamber fully. The .577/.450 carbine load is .45-70-410 in black powder terms, virtually the original load of the .45-70 US Government cartridge and light for a contemporary British big game rifle. It seems from broadsheet (Figure 4) language to have been...
the lightest cartridge offered for the Double Patent rifle, and that chambering, if correct, is consistent with a lady’s or boy’s use.

The barrel is marked “T. W. WATSON, 4 PALL MALL, LONDON” starting on the top flat of the 2½” half-octagonal breech and running on to the top of the round, straight tapered remainder. The barrel is 28½” long, typical for a “Cape” rifle and standard for known Tranter sporting rifles regardless of action or chambering. It has six-groove Enfield rifling of 24” right hand twist, the lands about half the width of the shallow grooves. The underside of the barrel carries full Birmingham proofs; that is, the barrel is neither rifled nor marked military style. The bore number is 52, however, military standard for the .577/.450 rifle and carbine cartridges.

Figure 11. The Watson specimen “as found” (top) compared to the same rifle with a typical Watson buttstock “transplanted” on to it (bottom). The alterations to the present stock become obvious on comparison.

the rear sight is a one standing, two folding, leaf and ladder, 1,100 yard “Cape,” but quite delicate, of original design and make, with platinum sight lines throughout. The poorly fitted front sight, possibly a replacement, is an arched blade of very soft iron, much like an enlarged contemporary revolver front sight in side view. However, approximately the lower half of its broadened rear edge is hatched to reduce glare and the upper half holds a teardrop shaped bone inlay. The serial number of the rifle, 304, the highest of the three complete original Double Patent rifles so far recorded, is engraved on a receiver flat at the top of the wrist, and its final digit, 4, is marked on most parts, including the barrel. Above the serial number, the tiny “Tranter oval” trademark usually seen on revolvers (Figure 12), has been heavily damaged by a filled bolt hole.

Consistent with patent 2509/71, the Watson rifle has neither the receiver sling attachment point of the 1869 patent and the Jones rifle, nor any bolt or screw replacing it. The action lever is about 22% longer than in the patents or broadsheet. Extended by an additional straight segment to beyond the receiver tang, the lever cannot latch closed by the spring catch claimed fourthly in 2509/71. Instead, Martini-Henry style, the trumpet shaped end of the lever snaps over a strongly sprung detent inside a steel socket set into the butt. From comparison with other Watson-built rifles, this particular form of extended lever appears to be a Watson ‘trademark.’

The Watson rifle has a long safety lever (“bolt”) swinging on the right hand side of the frame per 2509/71.

Figure 12. The “Tranter oval” trademark. Destroyed by one of two crudely filled bolt holes in receiver flat; its missing segment has been restored in this image.

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The Watson rifle has a long safety lever (“bolt”) swinging on the right hand side of the frame per 2509/71.
The lever must be swung through 90° to change its setting. In the vertical position, engraved “BOLTED” in tiny characters, it is in the safety position; in the unmarked horizontal, it is ready to fire (Figure 9 bottom right, Figure 10). The patent drawing (Figure 2 top) shows it at “fire” when horizontal rearward, “safe” at 180º forward, which is not particularly helpful. The safety cannot be “bolted” unless the action is cocked. The safety “bolt,” itself the entire safety mechanism, is removed by simply screwing it out of the frame counterclockwise, as described in the broadsheet. This particular safety, though well worn, still positively locks the trigger, in testament to soundness of the design.

Most importantly, however, the rifle does have the long lower extractor arm with a cam upper surface (Figure 2) described in the fifth claim of 2509/71, but with an added “stop,” a raised contact point with a separate cam for the front end of the breechblock, which provides crisper ejection (Figure 13). When the front end of the breechblock contacts this “stop,” the motion of the extractor is abruptly accelerated (at low leverage) to throw the cartridge or case clear of the action. The Watson rifle only differs from FIGs. 3 and 7 of the patent 2509/71 drawing (Figure 2) in lacking the (optional in the broadsheet) cocking indicator; it is a true “Double Patent Rifle.”

The “T. W. WATSON 4 PALL MALL LONDON” marking was used by Thomas William Watson between 1878 and 1884. While this was before William Tranter’s 1885 retirement, it extends after the final 1876 patent lapse. Much about the rifle, barrel length, general proportions, etc., seems “classic Tranter,” the serial number fits Tranter manufacture, a “Tranter oval” is used in its markings, and the rifle was made before Tranter retired. Perhaps, therefore, Tranter made the rifle for Watson (who in 1882 became Tranter’s son-in-law). On the other hand, Watson may have built the rifle on an action made earlier by Tranter; since much of Tranter’s production was “to the Trade,” wholesaled to be finished by others. Watson had full manufacturing capability and was undoubtedly influenced in his style by Tranter.

Another Double Patent action, S/N 262, recorded by Kerry Guerin, is an action-only hulk, missing parts, pitted and without its original finish. It has a striped hyaena engraved on its right side and an Indian elephant on its left. These do not represent game animals as in European firearms engraving, however; in India, all animals have symbolic meaning.

The hyaena runs through a Christian graveyard, grown with grass and weeds, its headstones falling down (Figure 14). In India, the “hyaena” is seen as a negative entity, a being of darkness, unclean, cowardly, and greedy, but with infinite patience. This makes its placement in a derelict colonial graveyard clearly symbolic of India eventually prevailing over the Raj. Unmistakably, “The hyena shall hunt among abandoned English graves.”

The elephant is Indian, male, and with very sharp tusks – therefore an elephant of ceremony, not industry. There seems to be some harness nonetheless; two straps, one behind the front legs and one (possibly decorated) around the belly, secure heavy bags on the back. There is no sign of a mahout (elephant rider). In Hindu India, the elephant is seen as the most positive of entities, wise, having and bestowing great longevity, remover of obstacles and bestower of prosperity. This elephant, with a forest to its rear, walks on bare earth. “The elephant shall clear the Raj to the very soil as he brings the seeds of a long lived and prosperous India,” may be read with more difficulty and less certainty than the hyaena’s message. The elephant is but the reverse to the hyaena’s obverse of a single symbolic coin.

While the animals were cut by a native artisan, there is typical British scroll engraving around the corners, screw positions, etc. Almost certainly, this English rifle, originally engraved there, was later acquired in India by a native of some wealth, at least locally important and (not surprisingly) hostile to the Raj, and re-engraved for him – a very interesting Tranter Double Patent indeed.

**The Braendlin Connection**

In his long history in the Trade, William Tranter made many allies. One of these was Francis Augustus Braendlin, a Bavarian mechanical engineer who became a Birmingham firearms entrepreneur and designer. He would found
the Braendlin Armoury Co. Ltd. in 1871, and hold three personal and share four joint English firearms patents. Braendlin designed some Tranter revolver systems and modified some Tranter-made, revolvers. In 1867, Aston Cross had produced 500 “Braendlin-Albini” rifles for Harris Holland’s contract to South Australia, which Braendlin was not yet prepared to do. The Braendlin Armoury Co. Ltd. was even a tenant of Tranter for at least a while.

While Tranter built some rook, rabbit, and kangaroo rifles on his own break-action patents, more of his sporting rifles were made on both large and small Martini actions by the Braendlin Armoury Co. Ltd. About 1871, the company acquired licenses for Martini’s English patents (2305/68 and 603/70), and pioneered Martini manufacture “to the trade” in England. Tranter’s relationship with Braendlin meant Tranter could obtain Martini actions at low cost from that point.

Conclusions
As long as any were available, the few completed Double Patent actions were evidently made up into rifles from time to time on special order and may also have been wholesaled for this purpose. We found neither military orders for Double Patent rifles nor specimens appearing to be from such contracts, which would have been the real key to its success. Tranter soon turned away from his own slow-selling design for the simpler, lighter, less expensive and more popular Martini action. Nearly 50% of Tranter’s Martini rifles recorded by Guerin are reported as Braendlin marked; likely most, if not all, are. The reverse also may be true: all Martinis with Braendlin actions lacking obvious maker’s marks should be carefully examined for Tranter marks on action and barrel. In the end, as was typical, the “improved Martini” lost in competition to the product it was expected to replace, even in the very capable hands of William Tranter.

References

Illustration Credits
- Photographs of the Tranter-Jones rifle from Berk (Figures 8, 9 top right).
- Photographs of the Watson sporting rifle courtesy Colin C. Michaud (Figure 10).
- Photograph of the “Indian” action hulk courtesy Kerry Guerin (Figures 9 bottom left, 14).
- Other photographs and broadsheet courtesy Maxine Stewart.

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Great War British & Empire Sniping Equipment (part 2*)

by Roger Payne

The Watts Telescope (Figure 1)

These are conventional terrestrial low power telescopes (approximately x2 magnification and broadly similar to the Aldis and PPCo). They were produced by (or for?) the London based company of ER Watts and bear the company name marked on to the ocular housing, together with the serial number of the individual instrument. Total procurement for the military is likely to be a little in excess of 150.\(^1\)

Concerning the method of attachment to the SMLE, the few surviving examples that the writer is aware of either have no rings remaining on them, or else each has different types of mount; so it is certain that more than one different mounting system was utilised to attach these telescopes to their rifles. To illustrate the point further, the author has three Watts telescopes in his collection; one no longer retains any mounts; one bears the remains of Daniel Fraser mounts; and the third sports Alex Martin rings (this last mentioned telescope also came into the writer’s possession with its mount base produced to conform to the contours of the SMLE rifle body). Additionally, a fellow collector in the UK possesses a fine example of a Watts scope bearing Purdey rings which are normally associated with the Aldis telescope. According to surviving documents\(^3\) Watts telescopes were set up by Daniel Fraser (36), J Rigby and Co (100?), and Jas Woodward and Sons (exact total unknown but likely very few). Clearly it is impossible to quote figures with any degree of certainty when both records are incomplete and surviving examples differ in mount type in some cases from what is indicated in those records that are still extant. Indeed contract details in the case of some contractors simply state ‘fit telescopic sights’, and we cannot assume that in all cases they necessarily fitted instruments using their own mounting systems. Other contracts state ‘fit telescopic sights supplied by the War Office’. Here, it is impossible to know whose telescopes were supplied and fitted. Thus, the waters are greatly muddied for the Watts, as well as other small volume production telescopes and mounting systems, the possible permutations of rifle, telescope and mount being quite considerable.

The Evans Telescope (Figures 2-4)

Recent discussion between the author and a leading authority on the London gun maker William Evans suggests that much of their product range (other than many
firearms themselves) was sourced elsewhere and simply retailed (or at best assembled and then retailed) by them. Admittedly this was a common practice in the domestic gun trade generally at the time. If the above supposition is true it must be admitted that the identity of the third party manufacturer is to date unknown. Regardless, surviving contract details indicate that somewhere in the region of 110 to 130 instruments were supplied to His Majesty’s government, the breakdown being as follows; 1915 for the supply of either 60 or 80 instruments (there is a discrepancy in the figures here and it is not certain if all telescopes supplied were of the Evans type, or may have included some produced by Goerz); 02/02/1916 was the contract date for the supply and fitting of a further 60 instruments.

The Evans telescope is again of a conventional terrestrial telescope type design and is quite similar to the Watts and the first three patterns of Aldis ’scope. It is readily distinguishable from these others by the possession of a knurled focussing sleeve that extends around the entire 360 degree circumference of the telescope tube. The maker’s name is generally engraved along the left side of the scope tube.

Two distinct mounting systems seem to have survived. Perhaps the best known being the large cast aluminium rail mount that exists on the complete rifle that is in the Imperial War Museum collection. This is the only example of this type known to the writer. However, more prevalent (though also very scarce) are the surviving more conventional two piece mount types, of which certainly a few telescopes seem to exist in private collections around the world. The front ring bears a single ‘foot’ which locates in a corresponding slot in the front mount base, which in turn is located against the rifle body side wall, its front edge butted up against the rear face of the receiver ring. The rear ring bears a cylindrical peg projecting downwards and which is notched to lock up against a roll over catch on the rear mount base. The rear base is also attached to the rifle body side immediately in front of the safety catch. The slot into which the foot on the front ring locates is mounted on a laterally adjustable dovetail. There would appear to be two variants (at least) of the front mount base that have been noted; one which incorporates a slightly projecting threaded bar with a ‘tommy bar’ hole drilled through it, permitting of relatively precise lateral adjustment by the winding of the dovetail one way or the other; the other pattern is essentially the same in principle, but simpler in that there is no lateral adjustment screw, movement of the dovetail block being effected presumably by means of a cramp or drift. As with most other mount systems of the era the Evans is mounted on the rifle offset to the left. Range drums are found graduated from 1 to 6 representing hundreds of yards, in keeping with usual practice at the time.

The Fidjland Telescope

The total number of this pattern of telescope accepted into service is unknown, but almost certainly is very small. It was developed by the Norwegian inventor of the same name and its spelling is often ‘anglicised’ into ‘FIDGELAND’. Surviving telescopes are very few in number. The author’s example does not bear an engraved government broad arrow mark (though the broad arrow was far from universally applied in practice, particularly on instruments procured early on in the war), but appears
to be of the type utilised and, apart from lacking anything of the mounting system, appears to be the same as the example shown on page 34 of ‘The British Sniper’ by Skennerton. The mount on the telescope shown in the book appears to be a rail with some sort of locating rim at the front and a locking screw at the rear. Quite what was the exact appearance of the mount base is not known.

It is believed that the Fidjland telescope was rated at a nominal five power magnification, and it has a relatively narrow field of view. The range drum, in common with some of the early purchase telescopes, is graduated from 1 to 5 rather than 1 to 6. Interestingly the author’s example is marked ‘Fideland’ on the telescope tube. It is not known if the designer of these telescopes was also the manufacturer, or whether they were manufactured in the UK (or elsewhere) under licence.

The Jeffery Telescope (Figure 5)
These instruments were supplied by W Jeffery and Co Ltd of London in two batches of fifty on 06/02/1915 and 19/01/1916. It is further documented that the famous gun maker of W Jeffery also supplied big game rifles for ‘loop hole busting’ in addition to the telescopes referred to above. The Jeffery scope is of a lesser diameter than most of its Great War era equivalents, being more reminiscent of the Winchester series of telescopes in this respect. The telescopes were marked ‘W J Jeffery and Co Ltd. London.’ on the range drum saddle, and military contract examples are readily distinguishable from their civilian counterparts due to minor differences in the range drum and saddle assemblies, and the presence of a rifle serial number on the opposite side to the manufacturer’s markings. It is quite clear from the surviving inter war Pattern Room Collection list that some of these telescopes were fitted to the SMLE, although others were fitted to the long rifle, two examples of which, bearing mount bases for the Jeffery, still reside in the National Firearms Collection (formerly The Pattern Room Collection).

The 1916 List of Changes 18392² concerning the introduction of a rubber eye cup for telescopic sights acknowledges that it was not suitable for the Winchester and Jeffery patterns of telescope due to the previously mentioned smaller scope tube diameter.

In addition to the telescopes discussed above it is known that other types were also fitted to service rifles, and these include though are not limited to the Stanley (sometimes spelled ‘Standley’), Westley Richards, Rigby, Gibbs, Baker, and others, including small numbers of instruments from German and Austrian manufacturers such as Goerz, Fuess, and Kahles. It is believed that these were early procurements and were probably drawn from existing supplies of optics purchased by the War Department from the domestic trade.

It is unlikely that we will ever know and understand the full range of telescopes and mounting systems used during The Great War, and even a relatively common telescope such as an Aldis turns up with its mounts intact these days there is much excitement amongst collectors. Due to the extreme scarcity of surviving examples of other early issue scopes the author must perforce move on from the field of scopes issued on a small scale with the SMLE and long rifle, to the subject of the sniper’s rifle that followed the many and varied SMLE variants, and which represented the first truly standardised design; the Pattern 1914 sniper’s rifle.

Enter the Pattern 1914 Sniper’s Rifle (Figures 6-8)
The early and mid-war sniping equipments were predominantly SMLE based and generally bore offset telescopes. It is said that the army considered the ability to charger load more important than placing the telescope over the rifle bore, and the controversy over whether this was the right thing to do has raged ever since. Certainly British and Dominion troops were generally equipped with SMLE’s fielding offset telescopes for the entirety of the war. But not quite entirely so.

It is clearly documented that Major H V Hesketh-Prichard, CO of the Second Army Sniping School had expressed his view that rifles equipped with offset telescopes put allied troops at a disadvantage in the sniping war against the Germans, and that remedial measures should be taken most urgently to supply the troops with rifles fitted with over bore optics. Clearly he...
cannot have been the only complainant because by 1917 there were signs of movement in the army hierarchy.

Whilst it was arguably the most rugged bolt action combat rifle ever to see service the SMLE, if truth be told, was not ideally suited as a base for a telescopic sight: the receiver was light, with rounded contours, and flexed appreciably on firing. The barrel was relatively light in profile and SMLE’s were also quite sensitive to variations in stockng up, which could materially affect accuracy. Not only this, but some of the mounting systems used with the telescopes supplied, were not of the best from a design point of view. For example, the Whitehead Brothers’ mounts used with the Winchester A5; the front mount base was secured not directly to the rifle body or barrel, but to the rear sight protector, which in turn was attached to the wooden fore end, and so subject to many variables that could adversely affect consistency of shooting. Added to all of this was the simple fact that there was no uniformity or consistency in the sniping equipments on issue. Fortunately it was eventually accepted that the troops needed a purpose-designed sniping rifle using a modern telescope design on over the bore mounts that preferably also permitted of the use of the rifle’s iron sights.

Prior to the outbreak of war trials were going on with a Mauser type rifle design in a new .276” rimless high velocity calibre as a possible replacement for the Lee Enfield series. The onset of war and the urgent need to produce arms in huge quantities rapidly ensured that that never came about. But, the new Pattern 1913 rifle was rechambered to .303” calibre and contracts were signed with both Remington and The Winchester Repeating Arms Company in the USA to produce the rifle for British and Dominion troops. Of course, as often happens, by the time that the rifles went into production and started arriving in the UK in quantity the crisis had abated somewhat, and there were generally enough of the service issue SMLE for the front line troops (the first Pattern 1914 rifles arrived in the UK in late 1916 and not in quantity until 1917). Even so, small numbers of these new rifles were evaluated and it was soon found that at practically encountered ranges the average Pattern 14 rifle was appreciably more accurate than the average SMLE. Consequently Pattern 14 rifles were issued to the Sniper Training schools in France in 1917, and this was soon followed by a request for a rear sight capable of a finer degree of adjustment for use on these rifles. This led to the ‘F’ Rifle, officially introduced on 22/11/1917, and issued late in the war to the troops on a scale of three per battalion. The rear sight of the ‘F’ rifle was modified by the incorporation of a finely threaded worm wheel with an adjusting knob fitted to the right side of the existing iron sight. This permitted of a much finer degree of incremental adjustment of the rear sight than by just the manual moving of the spring loaded catch on the standard sight cursor.

Again, in 1917, a German Hensoldt light telescopic sight on claw mounts was captured and sent back down the line for evaluation. It was sufficiently impressive to be copied in a modified form, eventually morphing into the Model 1918 Telescopic Sight (the trials being supervised by Lord Cottesloe and Lt Col LH Robinson, Chief Inspector of Small Arms at RSF Enfield). But retracing our steps a little, on discovering the inherent accuracy of the Pattern 1914 rifle, Aldis telescopic sights were soon obtained for mounting on to available rifles in small quantities using claw mounts, and were found to produce good accuracy results. For reasons of which the author is unaware the Aldis was not generally adopted for use on the new snipers rifle, and the Model 1918 telescope was accepted into service, being produced by The Periscopic Prism Company of Kentish Town in London (well known for their production of the modified Fues telescope that bore their name and was fitted in offset dovetail mounts on the SMLE earlier in the war). The decision to mate the new telescope to the new sniper’s rifle had been made by the Spring of 1918, and quick detachable claw mounts were to be used as the mounting system. Additionally, all rifles were to be fitted with the fine adjustment iron sight as well as the M1918 telescope.

The new telescope was rated at x3 magnification and had a reasonable field of view of 7.5 degrees. As referred to above, it was produced by the Periscopic Prism Company in London. This company had not had a particularly smooth or profitable war, and as a result of its inefficiency was taken over by the Ministry of Munitions, so as to permit of direct supervision over production. Manufacture of the new telescope and mounts took place there and 2001 complete sniping equipments were produced in total, commencing in the Spring of 1918. (A further 79 equipments were produced by BSA but these are unrelated to the UK contracts and were produced specifically for the Irish Free State during the 1930s). 3

Arriving at the very end of The Great War the Rifle, Pattern 1914 W Mk1* (T) really did not get much of a chance to prove what it was capable of, and in practice saw far more active service during World War Two, before being eclipsed in its turn (at least in the European Theatre of Operations) by the No4 Mk1 & Mk1* (T). A rubber eye cup was also introduced for the Model 1918 telescope and perforce differed from earlier types for the Aldis and PPCo due to the newer scope’s smaller diameter ocular and objective housings. Although precise quantities are not known, surviving telescopes exist suggesting that as well as the Model 1918 instrument the Periscopic Prism Company during 1918 did fit some Aldis
telescopes into claw mounts for use on the new sniper’s rifle. Mount bases in some cases are thought to have been the same as those used with the Model 1918 telescope, and the rings also, save for them being of 1” diameter to accommodate the larger instrument. It seems quite feasible that these equipments were produced at about the same time as the very similar over bore claw mounts that were developed for the SMLE. Further, some later production Aldis telescopes have been noted with range drums graduated from 1 to 10 (100 to 1000 yards) rather than the more usual 1 to 6 graduations found on most WW1 UK military contract telescope rifle sights. On these particular examples the scope tubes are engraved ‘fitted by Perisopic Prism Co Ltd London 1918. At least one set of mount rings for the SMLE have also been noted engraved similarly except that the date was 1919. (A very few other sets of SMLE mounts have been noted in the white unmarked).

Previously, journal articles have referred to the Rifle No3 Mk1* (T) A as a WW1 issue sniping rifle. This is an understandable error to make, as both the rifles (Winchester manufacture Pattern 14’s) and the telescopes (usually the Aldis, but also on occasion the PPCo, Watts, and Evans models) are all of 1914 – 1918 vintage. However, these rifles were set up early in WW2 on a non-readily detachable side rail mount, by Alex Martin of Glasgow. An initial batch of 400 rifles was completed, and an order for a further 400 was placed, although only 21 equipments were completed before the contract was cancelled (presumably as the much better No4 (T) was starting to become available) in 1941.

The official date of introduction of the Pattern 1914 Sniper’s rifle was 31/12/1918 but production had commenced some months before this. The specification, number SA 452A is written out in full on pp 77 to 89 of Skennerton’s ‘The British Sniper’, along with instructions on care and adjustment of the Model 1918 telescope, for those seeking more detail.

During WW2 whilst most Dominion troops were equipped with British produced, or at least, British pattern rifles, there was a reasonable amount of experimentation in both Australia and Canada, in order to augment supplies and meet local need. However, in The Great War, whilst there was a far greater multiplicity of sniping telescopes and mounting systems, virtually all of these originated from the UK. The sole official exception being the sniping use of the Model 1910 Ross rifle by Canadian forces.

The Ross Rifle in a Sniping Role (Figure 9)
The development and adoption of the Ross Model 1910 straight pull bolt action rifle has been well documented elsewhere, and it seems that politics and economics played as much of a role in producing the Ross as did military necessity. Certainly, at the onset of the Great War Canadian forces were equipped universally with the Ross rather than the SMLE or other models of the Lee Metford/ Lee Enfield family. The Ross has long been as not being a very robust or safe design, a reputation it does not fully deserve. Admittedly it was possible to assemble the bolt incorrectly resulting in the rifle firing without the bolt lugs locking up, but a remedy for this was found soon enough. There is also no doubt that the chamber of the Ross was machined to very tight specifications and this, combined with indifferent quality wartime produced ammunition led to frequent jamming when a number of shots had been fired and the rifle heated up. The problem would be further exacerbated by the ingress of mud into the mechanism, something almost unavoidable on the Western Front. These factors probably account for the stories of soldiers resorting to kicking the bolts back to extract and eject the fired cases that were stuck in the chambers of their rifles. Again, a simple remedy was found, that of reaming out the chambers a little.

However, one thing can be unequivocally stated about the Ross rifle; it was very accurate, lending itself rather better to its employment as a sniping rifle than the SMLE ever did. Indeed the Ross converted to target rifle guise could be seen performing admirably on rifle ranges around the world for several decades following the Great War.

Many of the target and Galilean sights produced for the SMLE, MLE, and CLLE rifles were also adapted and produced for the Ross, so it would seem highly probable that enterprising individuals are likely to have taken them with them when they went to war. But there was only one formally contracted and produced sniping variation of the Ross, this being an entirely North American set up, making use of the US designed and produced Warner and Swasey Model 1913 musket sight (Figure 10). Warner and Swasey of Cleveland Ohio had produced a prismatic type telescopic sight that was adopted by US forces as the Model 1908. Following modifications the Model 1913 appeared and was also taken into US service. It is this latter model that was also produced for Canadian use, the first order for 250 instruments dating from 11/03/1915, and the second from 19/02/1916. Deliveries were completed in July 1915 and October 1916 respectively. Telescopes were fitted at the Ross Rifle Co. factory in Quebec, using
part-finished mounts provided by the Warner and Swasey company. Final machining and heat treatment were carried out at the Ross company premises.

The telescopes are of a rather unconventional appearance, working on the Porro Prism principle unlike most conventional terrestrial telescopes. They were rated at an impressive six power magnification but had a narrow field of view of only four and a half degrees. Sights produced for the two Canadian contracts had the range adjustment calibrated for .303” ballistics, and the original range plate which was attached to the top of the scope housing and which was only relevant to .30”-06 ballistics, was removed. Canadian issue scopes were also serial numbered separately to those produced for US service and are numbered from 1 to 500. All telescopes possessed their own leather carrying case and these appear to have been ‘locally’ produced in Canada. The first 250 rifles were completed by late 1915 and it is known that eighty were sent to the front line, though it is not entirely clear how many more, if any, were sent subsequently. A January 1918 return for Canadian sniping rifles distributed throughout all four of the Divisions constituting the CEF indicates that there were 65 Ross rifles and 81 SMLE’s to hand. However, it is thought that these figures are incomplete and are therefore underestimates. All Ross rifles appear to have been fitted either with the W and S or the Winchester telescope (presumably the A5, B4 or B5). As late as 1937 Ordnance returns showed 399 Mk3 Ross/W and S sniper’s rifles to be held in store, and most of them purportedly in unused condition.

Front line service of the Ross/W and S combination resulted in further problems coming to light: the heavy offset telescope was not liked, and would often not retain its zero when the scope was removed from the rifle and then subsequently replaced. This led to tales of snipers jamming razor blades between the mount base and the upper mount assembly in order to secure things more rigidly. Of course, under these conditions scopes must have remained semi-permanently on rifles and must have been a nightmare to remove from their rifles when it was eventually desired to do so!

Most of the difficulties associated with the Ross/W and S combination in a sniping capacity were due more to problems with the scope and/or mount than to deficiencies in the rifle itself, and so perhaps it is fortunate that other telescopes were fitted, albeit unofficially, to the Ross with some success. Use of the Winchester A5 fitted on dovetail ‘V’ blocks and often on rifles with cut back ‘sporterised’ woodwork, is well known. Additionally other telescopes were fitted by Canadian armourers, and these include examples of the Perisopic Prism Company (modified Fuess), and captured German instruments. Of these unofficially fielded variants it would seem that the Ross/Winchester combination was the most commonly employed, though the number assembled is unknown.

It is difficult to know where exactly to draw the line when writing on the subject of Great War sniping, and exactly how much to include; should one describe luminous sights, periscope rifles, or ‘big game’ rifles utilised for ‘loop hole busting’, for example? However, the line must indeed be drawn somewhere and the author of this modest article is more than happy to let some other brave soul tackle describing these and other aspects relating to the wider subject of Great War marksmanship.

Much of the above information is available in standard texts on the subject, but some detail concerning the various mount configurations has come from the author’s own observations of items in his own and colleagues’ collections. Any errors of omission or false assumptions he may have made he accepts and apologises for.

This brief article would have been far less than it is without the help of a number of friends and institutions. These are individuals or organisations who have either helped specifically with this text, or who have enriched the author’s life over the years with their friendship borne of a shared interest; David, Carol, and Jenny Tomkinson, Hugh Rees, Nigel Greenaway, Captain Peter Laidler, Richard Stork, Eric Kirk, Simon Deakin, Martin Pegler, Tony & Robert Hallam, Tony Watts, Robert Hanna, Harry Furness, Ian Skennerton, The late Bruce Gorton, Robert Etherington, Richard Ruiz, The National Firearms Collection (formerly The Pattern Room Collection), The Imperial War Museum and The Royal Armouries.

References

Beyond the Machine Gun

Re-interpreting McMahon’s ‘Fire Fighting’ lecture of 1907

by Nicholas A. Harlow

The period between the end of the South African War and the beginning of the First World War was one of change; gradual in some areas, and violent in others. In terms of musketry, it was arguably the former, in a process of adapting the training that had developed since the mid-1880s to suit revised requirements. This involved an expansion of individual training, with a much greater focus on snap-shooting and moving targets. At the same time, the Russo-Japanese War (1904-5), arguably far more ‘conventional’ in nature than that in South Africa, was eagerly examined in the hope of learning new lessons, or supporting old ones.

Almost inevitably, the ideas which developed were often in tension with existing orthodoxies. The increased spacing between troops, to limit their vulnerability to artillery and small arms fire, created difficulties in achieving the necessary density of fire at the critical stages of the attack. This also decentralised the initiative to individual soldiers, rather than being centralised in a fire commander, which it was feared might lead to a lack of direction and wastage of ammunition. These debates were not new, with discussions of how best to gain superiority of fire going back to at least the late 1870s, often centring on whether it was the bullet or the bayonet which would decide battles. In the immediate aftermath of the South African War, some felt that the bayonet had finally been supplanted, and that it was the rifle along which would bring victory. However, the events in Manchuria were used by elements within the British Army to support their arguments for restoring both direct fire control and the primacy of the bayonet.

In 1907, the School of Musketry incorporated its analysis of the Russo-Japanese War into a summary of three lectures on aspects of fire tactics; ‘Superiority of Fire’, ‘Vulnerability’, and ‘Fire Effect’. It was on these same topics that the Chief Instructor of the School, Lieutenant-Colonel Norman McMahon (Figure 1), spoke to the Aldershot Military Society that December, under the title ‘Fire Fighting’. McMahon was a Royal Fusiliers officer, who had seen service in both the Third Anglo-Burmese War (1885) and the South African War, receiving the Distinguished Service Order during the latter. He is most widely remembered for his time at the School of Musketry, between 1905 and 1909, and for the invention of the ‘Mad Minute’ (earning him the title of ‘Musketry Maniac’). This was ostensibly created in response to the authorities’ refusal to increase the number of machine guns per battalion. The British Army’s skill at rapid fire is often credited with having played a key role in the effectiveness, and survival, of the British Expeditionary Force in 1914. McMahon played a personal role in that story, as the commanding officer of 4th Battalion, Royal Fusiliers, from the Battle of Mons until his death in the First Battle of Ypres in November 1914.

The majority of references to ‘Fire Fighting’ come from discussions relating to the pre-war machine gun debate. This appears due to two authors, whose works in this field provide the greatest sources of information about the lecture’s contents and impact. Charles Pridham, although arguably biased, is the best source of contemporary details regarding McMahon’s work,
particularly quotations from lectures given at the School of Musketry during the period 1905 to 1911. 10

F.V. Longstaff and A.H. Atteridge’s *The Book of the Machine Gun*,11 has a much stronger focus upon the evolution of tactics at this time, as well as a detailed bibliography on the subject which incorporates notes on the contents of the lecture itself. This appears to have been the only attempt to examine this lecture in any particular detail, due perhaps to the unofficial nature of the forum in which it was presented, and the rarity of the original text today (Endnote 5). This article intends to examine these notes (indicated by Roman numerals in the quotation below), demonstrating the misinterpretations of the author’s comments, and that the original discussion was far wider in scope than simply machine guns.

The comments of the reviewer, F.V. Longstaff, were as follows:

“This is a most important historical study which shows an active period in the formation of British Machine Gun Tactics. He regards the Machine Gun as being an automatic rifle,1 and advocates converging fire whether from the front or a flank.11 Intervals between large bodies of troops in the attack are good positions for Machine Guns.11i Successful combination might take the form of an established system of rapid ground reconnaissance, a careful allotment of duties with fire, under the heads of (1) Organisation; (2) Direction; (3) Control; (4) Discipline: a definite system of selecting targets based on general principles for distribution of covering fire and concentration of decisive fire.11v The means are specified in the books, but great things are necessarily mixed up with small, and those which have general application are indistinguishable from those of limited bearing; fire effect cannot be studied at manoeuvres; it can best be dealt with theoretically at musketry conferences, practically on rifle ranges.11v If attention is confined to a certain area of ground, the quick application of fire and judging distance is facilitated.11vi The case in which the volume of fire is restricted by frontage is one of many in which Machine Guns will be invaluable.11vii If Machine Guns are massed with us there is no chain of command.11viii Our own great difficulty is want of GROUND [sic] for the study of fire direction and effect11ix the areas should be wide enough to force officers to use field glasses for fire direction and effect all the time.11x Our traditions of rapid and accurate fire date back nearly 600 years.11xi Chairman: ...The necessity is for our not repressing, but rather directing, the initiative of our company officers. What is wanted is to direct that initiative into suitable channels and to give them general principles to work on... for the common good.11xii,11xii"

When compared to the original lecture, it becomes clear that Longstaff drew on twelve points from McMahon’s text. However, in removing them from their context, and often paraphrasing or misquoting at the same time, he appears to have misrepresented the lecture. Taking the points in sequence:

(i) McMahon did describe the machine gun as “...after all only an automatic rifle”, which “may be regarded as the Infantry weapon of the future.”13 Given that the primary machine gun in service was then the Maxim, weighing approximately 60lbs (27kgs) in total, a more portable design was required before this became practical. The Madsen light machine gun, under the name ‘Rexer’, had been tested and rejected by the Army in 1904.14 In addition, the Small Arms Committee had trialled five types of automatic rifle since 1900,15 several of which had also competed at Bisley in 1904,16 and McMahon would have been well aware of these efforts.

(ii) The comment about converging fire is taken from a longer discussion as to the best method of achieving superiority of fire,17 and is a general observation for the Infantry as a whole. Converging fire from a single front was suggested for occasions where “…envelopment is impossible,”18 and one which came with caveats if executed on the French model, as McMahon felt they concentrated on too small a front during the attack.

(iii) The placement of machine guns at the intervals between forces is arguably one of Longstaff’s greatest misinterpretations. It was actually not McMahon’s idea, but that of the German Army, who felt that “The borders of these intervals in a defensive line are regarded as good positions for machine guns,”19 [my emphasis]. Given the weight of the Maxim gun, this would have been almost impossible in an attacking formation prior to the introduction of some form of light machine
gun. There is a discussion of the French Army’s thoughts on the use of intervals in the attack, and the conflation of these two ideas suggests that Longstaff was only giving a cursory examination, particularly as this point is given correctly earlier in the same book.20

(iv) The list relating to duties of fire is actually lifted almost entirely from McMahon’s talk,21 but with two alterations. The first is the omission of the word ‘fire’ from each of the four headings, giving the impression the system had a wider application than perhaps intended. More importantly, the original list was actually a suggested sequence for company commanders to follow during an attack, providing a definite and consistent set of principles for framing orders, but with enough flexibility to adapt to the widest range of situations, so better enabling “successful combination” (combination in this case referring to separate companies acting in concert during an attack). He also removed McMahon’s original suggestion that this style of training could best be reinforced through musketry conferences.

(v) The description of the failings of the manuals, and of the best way to teach an understanding of fire effect, is quoted verbatim, and so retains its meaning unaltered.22

(vi) The first acknowledged quotation is taken from comments relating to fire commanders, adjusting sights for targets representing an enemy advancing in short rushes, rather than aiming off.23 Whilst it is quoted correctly, it forms part of a series of suggestions regarding how best to distribute the fire of companies to create the greatest effect, in both the attack and defence. Some of the points he raises during this section also reflect the flexibility required on the modern battlefield, particularly that a ‘broad principle’ was needed that could both distribute fire for ‘neutralising purposes’, or concentrate it for ‘decisive effect’, as the prevailing situation required.24

(vii) The following comment also formed part of that discussion, and is actually a mini-paragraph of its own.25

(viii) The reference to the lack of a command structure for massed machine guns is an offshoot of this discussion of fire organisation,26 relating to the decision by Germany, Austria, and Japan to use their machine guns in batteries for greater flexibility. Although this was counter to normal British practice, it had been used during the South African War on an extemporised basis,27 but it lacked a command structure to support it, creating another duty for the Brigade Staff. In World War One, this problem was at least partially solved by the creation of the Machine Gun Corps in 1915.

The final four points are all concerned with aspects of British training, and what direction it might proceed in. The comments regarding ground and field glasses are more complicated than they appear:

(ix) This is a slightly inaccurate quotation, as the emphasis of ‘GROUND’ is Longstaff’s, and it was necessary ‘for the study of fire direction and fire effect’.28 Whilst the omission does not materially alter the quotation, the emphasis is a technical distinction, as the British Army had a particular lack of open, unmeasured ground on which to conduct field firing exercises, as distinct from classification ranges. McMahon made the comment in contrast to the accommodation of other armies, particularly the Russians, whose training included field firing at distances over 2,700 yards. This was unheard of in Britain, where a contemporary Commandant of the School of Musketry described the Hythe ranges as too featureless and restricted for training, and in pressing need of being supplemented with more land for experimental purposes.29

(x) The second half of the statement is almost entirely Longstaff’s creation. Although McMahon mentioned that ranges of ‘adequate extent’ would demonstrate the need for glasses to be used by those directing fire,30 he was not referring to field glasses, but to spectacles, as part of a discussion about the poor eyesight of those directing fire. This comment was also expanded upon by the Commandant of Hythe, Colonel Egerton, in the discussions that followed the presentation.31

(xi) The comment on the antiquity of the British rapid-fire tradition is taken from McMahon’s conclusion,32 and is a reference to the mediaeval bowmen who appear to have formed such an inspiration to those involved with rifles during the second half of the Nineteenth Century.

(xii) The final comment was made by the Chairman,33 Major-General J.M. Grierson, during his summary, and is more abbreviated than Longstaff admitted. Between the first two sentences there should actually be two more, in which Grierson refuted comments (not made by McMahon) suggesting that British officers lacked initiative. The section which is noted as having been omitted is that those general principles would then guide their initiative ‘for the common good.’ This abbreviation does alter the relationship between the initiative of officers and the general principles they were to be guided by, removing the reinforcement contained within the original statement.

Whilst understandably focussed on machine gun tactics, Longstaff’s somewhat haphazard approach to quoting the lecture altered some of McMahon’s points in ways that diverged from the original statement. In part, this is a reflection on the scale and complexity of McMahon’s original text, which was intended to ‘...review the changes which have taken place in methods of training since the last great war, and to refer to more recent developments which may influence fire tactics in the future.’34 His arguments are very tightly composed, and resistant to attempts to
history of the School:

the best demonstration of this comes from Major Myatt's

has been a certain level of misinterpretation. Perhaps

lecture, it seems that, like Longstaff's commentary, there

forward the idea that automatic rifles might be adopted

what role was as yet unclear), but McMahon also put

feared as it once had been. That machine guns were

attack, although he agreed that it was no longer as

felt the bayonet still offered soldiers a moral boost in the

improvements in battlefield mapping techniques.35

when examining the changes made by other armies

since 1902, and comparing them to those of the British

Army, the suggestions he makes cover every aspect of

the modern army's operation in the field, and how this

could then guide future training. It also includes some

unexpected points; for example, from the perspective of

the bullet/bayonet debate, McMahon held a compromise

position: 'The bayonet is still necessary, but fire has

supplemented it as the principal decisive agent.'36 This was

commented upon by Brigadier-General Mackenzie,37 who

felt the bayonet still offered soldiers a moral boost in the

attack, although he agreed that it was no longer as feared as it once had been. That machine guns were

to play a role in the future was undeniable (even if what role was as yet unclear), but McMahon also put forward the idea that automatic rifles might be adopted in the near future. He even went so far as to urge the 1910 Staff Conference:

"We [the British Army] must solve the problem of

automatic weapons and show the way to the rest of

Europe."38

However, this appears to have been felt far less important, or controversial, than deciding the correct interval between soldiers, or the relative importance of the bayonet and the rifle. This can be seen in the discussion, when the Chairman asked for opinions on machine guns, and received only a brief comment from a Captain Bryant that the 5th Infantry Brigade had experimented with brigading during that summer's training, but there had been no opportunity to employ them.39

When it comes to assessing the wider impact of this lecture, it seems that, like Longstaff's commentary, there has been a certain level of misinterpretation. Perhaps the best demonstration of this comes from Major Myatt's history of the School:

"The Russo-Japanese War had demonstrated very

clearly the great value of [machine guns] and the

Chief Instructor Lieutenant-Colonel N.R. McMahon,

DSO, of the Royal Fusiliers, was an expert in them and a

great exponent of their potential value in war. In 1907 he gave a lecture on Fire Tactics to the Aldershot Military Society which was so impressive that the relevant parts of British Field Service Regulations and other Manuals were re-written to incorporate his views. Copies of these reached the Germans, who in their turn were sufficiently impressed to embody McMahons views in their own Regulations..."40

Myatt appears to be expanding on comments made by Pridham,41 and both appear guilty of exaggeration.

Neither the Field Service Regulations, nor the Musketry Regulations, were advanced until 1909, and both built on their previous editions from 1905. The Field Service Regulations did make steps towards introducing a form of tactics that would ensure units worked towards common goals,42 although this drew from light infantry tactics, examination of which had begun after the experiences of both the South African War and the Tirah Campaign.43 Perhaps the more feasible narrative comes from the main text of Longstaff & Atteridge's work:

"McMahon... as the result of systematic experimental work, drew up the notes on machine-gun tactics that were embodied later on in the drill-books, and as we have already noted influenced German opinions and methods."44

As there is no date attached to this, and as it is known that McMahon, after completing his period of service at Hythe, spent seven months 'specially employed at the Headquarters of the Army',45 it seems most likely that the notes referred to were drawn up during the latter half of 1909. Comments made at the Staff Conference in 1910 suggest that the results may well have been incorporated into Infantry Training, 1911,46 although it is impossible to state that with any certainty, due to the anonymous nature of official manuals.

So why did McMahon mean so much to the early machine gun historians? At a general level, his contemporary sobriquet of 'Musketry Maniac' appears a strong indication that they recognised the 'Mad Minute' was the direct result of his work (Endnote 7). At a technical level, he appears to have been the highest-ranked exponent of these tactics, leading one historian to describe him as the leader of 'the small group of fire-power enthusiasts'.47 When compared to the likes of R.V.K. Applin and J.F.C. Fuller, both of whom were captains at this time, neither were in as influential a position as Chief Instructor at the School of Musketry. However, his beliefs were far from universally held at the School; his predecessor, W.D. Bird, was not totally convinced of the benefits of machine guns in 1904.48 Perhaps more worryingly for McMahon, his successor, J. Campbell, appeared to have reversed some of his theories in a presentation to the Aldershot Military Society in 1911.49 He was also the only one of these men to die in the First World War, whilst both Applin and Fuller played active roles in the development of tactics, both during the war and after. The feeling of his loss is suggested by Captain E.J. Solano, designer of the landscape target and editor of John Murray's Imperial Army Series of training books, who chose to dedicate later editions of the volume on musketry to McMahon.50 For contemporaries like Longstaff and Atteridge, McMahon demonstrated the failure of both the Army and Government to understand the potential of the machine gun, or to seize the initiative in developing the technology, during the years prior to World War One.

As the only public discussion of his theories, 'Fire Fighting' was used to demonstrate the accuracy of his assessments, as well as perhaps suggesting the potential impact he might have had, if he had not died so early in the war. However, this obscured his
role within the wider tactical debates of the period, something which is now being reassessed, with Spencer Jones considering McMahon’s work as part of a longer evolutionary process.51

The value of ‘Fire Fighting’ today is two-fold; it is a detailed contemporary analysis of the training of the major armies, during a period where tactics that would shape the opening engagements of the First World War were being formed. It also includes the opinions of an officer at the forefront of technical and tactical thought, one whom was felt by some of his contemporaries to be visionary in his understanding of the shape of warfare to come. It is hoped that the reprinting of this transcript will allow its further re-evaluation, and perhaps a better understanding of its place within that formative period.

**Endnotes**

1. Table “B” of The Musketry Regulations, 1898 laid out just six ‘Deliberate Individual’ practices, as preparation for nine sectional practices. The first Table “B” issued after the South African War, in 1902, listed fifteen individual practices, including moving and vanishing targetry, with a separate section for field practices which were to be devised by individual commanding officers. The regulations current at the time of McMahon’s presentation, issued in 1905, listed nineteen individual practices in the classification section alone.

2. The most often repeated version is that a recommendation was made by the School of Musketry to increase the scale of issue from two to six guns, dated by various authors between 1905 and 1909. Shelford Bidwell and Dominick Graham argued that what was actually recommended was the introduction of six light machine guns, rather than four additional Maxim guns. However, Tim Travers was unable to find any official mention of such a recommendation during research carried out in the 1970s. See Bidwell, S., & Graham, D. (1982). Fire-Power. London: Allen & Unwin, pp. 49-52.

3. A review of the lecture was printed the day after the presentation in the Times newspaper, but appears to be unknown in the literature. See [Anon.] (1907, December 19). Modern Principles in Musketry. The Times, p. 10.

4. The book was sponsored by Thomas French and Sons, producers of machine gun belts. Although printed some thirty years after McMahon’s death, Pridham appears to have had enviable access to both officers and records from the pre-war School of Musketry.

5. The National, Academic and Specialist Library Catalogue (COPAC) lists only a single copy, held in the British Library, and incorrectly catalogued under ‘MacMahon’. See British Library, 08821.aa.16.(5.)

6. This post, originally entitled ‘Assistant for technical duties & Regimental Range Construction’, was created in September 1902 to specifically address the various issues with range accommodation throughout Britain. Carey, a Royal Engineer officer, was the first holder of this post (until November 1907), and his work was commended by the Commandant upon his departure.

7. It is worth noting that various individual rapid fire practices, albeit on a much more limited scale, had been included in Table “B” since the South African War. Prior to 1900, whilst rapid practices had formed part of musketry training, the majority were conducted as sectional practices.

**References**


18. Ibid., p. 3.

19. Ibid., p. 3.


22. Ibid., p. 7.
23. Ibid., p. 8.
24. Ibid., p. 8.
25. Ibid., p. 8.
26. Ibid., p. 10.
27. Ibid., p. 9.
28. Ibid., p. 12.
31. Ibid., p. 16.
33. Ibid., p. 17.
34. Ibid., p. 1.
35. Ibid., p. 9.
36. Ibid., p. 2.
37. Ibid., p. 15.
41. Pridham (1945), p. 54.
44. Longstaff & Atteridge (1917), p. 95.
So much has been written in the last few years as to the conduct of the fire fight, that there can be no excuse for taking up your time with re-consideration of well-established principles which have received universal assent; my purpose this afternoon is to review the changes which have taken place in methods of training since the last great war, and to refer to more recent developments which may influence fire tactics in the future.

It will, I hope, be understood that any suggestions I may make are personal only, and have no value unless they serve as a means of promoting discussion.

The continual improvements which take place in arms and ammunition alter year by year the comparative values of fire and shock, penetration and envelopment, fire effect and invisibility; the physical and moral qualities of soldiers may change but little, yet weapons are being invented nowadays which exert peculiar moral influences of their own.

We ourselves were the first to feel the moral effects of the void of the battlefield and long range enveloping fire; now there is clear evidence of the moral depression caused by machine guns when used against the best troops, as well as that of President Roosevelt and others as to the encouragement they give to their own side; the next war will show whether quick-firing guns and rifle-armed Cavalry can exercise a decisive moral influence on the battlefield.

It should not be forgotten that in peace manoeuvres we employ our own tactics to meet our own tactics; it is the common experience that in war tactics must be modified to meet those of the enemy. The normal methods of foreign powers, especially those whose tactical principles inspire other nations, must, therefore, be of interest, and it is noteworthy that divergent views exist abroad as to the correct application of recent war teaching to certain important problems of training.

Notable developments have taken place since Manchuria; Artillery especially have gained in power through their rearmament with quick-firing guns, fitted with shields; they have thus become practically immune against Infantry frontal fire beyond about 1,000 yards; they are said to be acquiring shells containing a composition which, by creating a curtain of smoke in front of a hostile firing line will destroy fire control and cohesion, and render aimed fire impossible; they have evolved also a system of indirect fire which will enable them to produce their greatly increased volume of fire without exposing their positions, while their comparative invulnerability will enable them to use their power intermittently at time intervals of their own selection. They will thus be able to open fire from concealed positions against Infantry committed to the attack.
All countries will before long have improved rifle ammunition with pointed bullets; this will give greater accuracy of fire up to about 1,000 yards, as may be judged from the shooting in the Palma trophy competition; the flatter trajectories secured will increase the dangerous space within the limits of fine shooting to an extent that will materially reduce the effect of errors in judging distance.

With this ammunition, Infantry will probably come to regard decisive range as limited only by the power of the eye to distinguish low service targets.

The extent of modern battlefields has more than ever demonstrated the necessity for mobile reserves, and no doubt we shall soon see all Cavalry armed with the rifle, and a greatly extended use of massed machine guns and cyclists.

The machine gun, being after all only an automatic rifle, may perhaps be regarded as the Infantry weapon of the future.

Recent events have indicated that darkness is the best form of cover for crossing reconnoitred ground in approach. Some foreign writers have affirmed that Infantry cannot advance by day under modern Artillery fire, even in widely extended lines, but recent experimental firing has not borne out this extreme view. Infantry, it is said, may reduce the fire effect of Artillery by concealing their movements or increasing the pace of their advance over open ground. They must, however, push on, and on no account lie down under observed fire.

It was to be expected that two wars of such importance as those in South Africa and Manchuria would bring about a general re-examination of motives and methods in tactics; the extraordinary developments of fire effect in the last ten years raise doubts as to the value of deductions drawn from operations of anterior date, except in regard to moral influences. Continental writers tell us that the tactics of Napoleon and Clausewitz remain orthodox; they can find only confirmation of their views in the events of the last decade, but they have, nevertheless, welcomed the publications of new manuals of training and tactics.

The general tendency abroad is to subordinate considerations of protection in all respects to those of fire effect. The bayonet is still necessary, but fire has supplemented it as the principal decisive agent.

The most effective fire is that which strikes in front as well as on the flanks, or from an oblique direction; therefore converging fire is the surest means of obtaining fire superiority; flank movements under fire being dangerous, it is best to gain the enemy's flank by concentric marches.

If envelopment is impossible, converging fire effect may still be produced by concentration from a single fire front.

The French are least inclined to development, regarding over-extension of front as a danger, and having the Napoleonic methods of penetration and local annihilation before their eyes. It is, however, certain that interior fire positions are a serious disadvantage, and that penetration, to be successful, must be made on a broad front, and with the fullest dependence on surprise and shock.

The strength of the Russian positions in Manchuria was opposed to surprise effect, and the battles were of inordinate length. General Oku's Divisional Commanders have impressed on us the danger of precipitate attacks on entrenched positions, and no army seems now to contemplate surprise attacks in such circumstances; careful reconnaissance and approach by night are everywhere prescribed.

Surprise is still attainable in battles of encounter and enveloping operations; under such circumstances the pace of the attack must not be lessened by protracted reconnaissance, long range fire, and entrenchment.

Intervals in attack are recognized in France as a necessity arising out of extended fronts. The attack will be developed in large groups, sufficiently close together to give mutual support and to ensure proper control.

Former objections to intervals in defence seem to have disappeared in Germany. The borders of these intervals in a defensive line are regarded as good positions for machine guns.

Frontages have not increased as much as might have been expected. All agree that formations must be adapted to the circumstances of each case, but normal figures for deployment are generally given. Japan, we are told, allows only 100 metres for a company of 200 men; Russia has increased to 130 yards; Germany to 150 metres for a company, 1,500 metres being the approximate frontage of a brigade of six battalions. Their normal frontage on deployment is, therefore, about half of that which we occupy.

The French are inclined to improve the organisation of their attacks, especially in respect to co-operation between Infantry and Artillery. Artillery protected by shields, and often invisible, will be able to deliver violent *rafales* of fire at intervals; these periods of fire will be used by the Infantry for their advances. They leave the decision as to the first opening of fire to company commanders, whose duty it is also to allot objectives to every section.

The chief fire position has disappeared from the regulations of Russia and Germany; with magazine rifles, defence is more stubborn; there is no longer fear of the bayonet, and the fire fight continues till the bayonet and the hand grenade are brought into use. In Russia the charge is delivered at 50 paces from the enemy's position.

The most definite orders as regards formations for approach are those issued provisionally in Russia. These admit the necessity for elastic formations and even single file fronts for artillery-swept ground, a contrast certainly to the battalion columns which we have been told were used sometimes at Heikoutai and Mukden, accompanied by bands, and preceded by ikons.

As the advance proceeds, successive rushes are made by units of smaller and smaller size, and for decreasing distances, squad commanders waiting to see the last man go forward before moving themselves.

Extended formations are now considered necessary by all armies in open ground, but it is evident that an extended formation cannot obtain superiority of fire in position fighting, and it is scarcely regarded as a fighting formation in Germany. As long as progress can be made in extended formation, it will be employed to save time, but if the enemy's fire causes a halt, reinforcement will be ordered, and fire will not be opened until a dense line has been formed.
This is in accordance with principle; to open fire with an extended line is to draw the enemy’s fire, render reinforcement difficult, and expose the extended line to the demoralising influence of fighting at a disadvantage without any reasonable prospect of gaining the superiority of fire which is necessary before the advance can be resumed. The Russians have adopted this principle.

When fire is opened, it will be opened in full volume, though it is recognised that troops using covered approaches will advance more quickly than those who have to cross the open, and that they must push forward to advanced fire positions, whence they can support with fire the advance of their more exposed comrades.

The great advantages to be gained by a simultaneous advance of the whole firing line, viz., saving of time and the division of the enemy’s fire, are apparently only to be attained at long ranges, for Russia and Japan have both come to regard small groups as the only means of progress at decisive range, and the length of their rushes is reduced so as to avoid exposure beyond the period of time required for an aimed shot.

The extent of modern battlefields and group fighting will produce numerous occasions for stubborn local defence; attack and counter-attack along extended fronts may produce strange situations and as many alterations of initiative as a game of cards; it will therefore be necessary in fire fighting to know the play of second hand as well as how to lead.

French writers have shown how the fullest use of the ground may be made for rapid organisation of defence, with a view not only to resistance on one strong position and counter-attack against the flank, but also as a means of creating favourable situations for counter-attack by means of fighting outposts, advanced posts, and selected fire positions. These should delay the enemy and draw him when disorganised under close fire of strong firing lines, so concealed as to avoid the effects of hostile neutralising fire. The climax would be the moment for a counter-attack or offensive return.

French tacticians tell us that the first object in defence is to devise means or site trenches so as to avoid the neutralising power of quick-firing Artillery; the German regulations emphasise the necessity for correct distribution of rifle fire both in attack and defence for neutralising purposes.

Considering the importance now universally attached to fire effect and eye training, the delay which has taken place abroad in introducing khaki uniform seems to be inexplicable.

Before consideration of training questions, I would summarise the motives which principally direct the energies of a force committed to a fire fight.

The chief decisive agent is probably converging fire, produced either by envelopment or oblique fire; next to that, smothering fire at very close range, and then the bayonet.

Considerations of surprise regulate the pace of advance except against fully entrenched positions; against such positions, attacks must be preceded by detailed reconnaissance, time must be taken, darkness used, and fire positions intrenched.

In all operations, rapid ground reconnaissance is necessary to ensure that the necessary volume of fire shall be forthcoming when required, that there shall be no demoralisation by ambushes or unnecessary exposure, and that each unit down to a company may be given a definite task.

Careful arrangements must be made for covering fire, both of Artillery and Infantry, which should include the timing of fire to agree with movement or intrenchment.

It is evident that the keynote of the composition is simultaneity and co-operation of all branches, all units, and all individuals.

We have heard much recently as to lack of initiative on the part of company officers, and of the necessity for individuality in the soldier, but it is not certain that initiative based on individuality is a danger to co-operation, and that initiative based on mutuality and common principles is the only means of securing combination.

It is necessary to make this allusion, for almost complete liberty of action is now with universal approval accorded to company officers after the deployment of attack. The superior allocates the task, the subordinate selects the means for executing it; there are no prescribed forms in war – normal methods are forbidden – hence there will be no guidance for company officers in action, except what is to be obtained from the enemy’s fire, orders received on deployment, and the dependence which can be placed on the correct procedure of neighbouring units.

If the company commander is given indefinite orders, his experience under fire is lacking, and his neighbours are trying to solve problems under fire according to prevailing conditions, there can be little hope of cohesion or a well-timed attack.

It is not to be expected that a number of men of different temperaments will arrive at the same conclusion in such a case; one will want to entrench and hold on, another to scatter and gain ground by trusting to rapid movement.

Combination at peace manoeuvres is illusory – there is no hostile fire to disturb it. Under fire, it may fail unless there is universal knowledge of principles to assist mutuality as well as a definite allotment of duties to ensure thoroughness of reconnaissance duties, and the issue of orders which are indispensable to efficient fire direction.

Strict adherence to principles may produce unreal situations in peace because there are no bullets; it may be a danger in war unless the information is good, but it is worth risking something to secure through combination and the feeling of confidence which it imparts.

It is interesting to note the effect of close adherence to fire fighting procedures during peace manoeuvres. An officer who was present as correspondent of the Daily Mail at the recent German manoeuvres in Westphalia tells us that a division of Infantry holding a position about eight miles long fired by mistake on their own Cavalry retiring at 10 a.m. The field of fire was restricted by wooded slopes about 2,000 yards in front of the firing line, and the intermediate ground was covered with standing crops.

Shortly afterwards a hostile Infantry brigade came into view, and within ten minutes from that time there were two Infantry firing lines representing, each of them, 12,000 men, firing heavily into each other at less than
500 yards range. At 10-15 a.m. the defenders delivered a
cavalry charge, and this was immediately countered
by an Infantry bayonet charge of the other side – an
extraordinary development of events certainly, to take
place in twenty minutes!

It is instructive to recognise here the guidance
of principles, the surprise effect of a rapid advance,
the absence of scouting and ground reconnaissance,
which might have caused delay and robbed the attack
of its surprise effect; the enormous development of fire
effect from the first opening, the reliance on natural
instinct rather than on esprit de corps or orders of superior
officers as a means of closing with the enemy.

A precipitate advance of this nature may have its
dangers in war; such was lately the experience of ourselves
and the Japanese, but it is necessary to realise the impact
of a blow delivered by such a volume of fire, and the
additional value of the surprise effect. If would certainly
cause serious trouble to a weak line of defenders, from
which recovery would be difficult. In such an attack,
combination, initiative, and ammunition questions are
deprived of most of their difficulties.

Since the application of definite principles to all
circumstances may lead to stereotyped forms and
dangerous situations, whereas the absence of any
prescription may render combination difficult and the
exercise of initiative of doubtful expediency, it should be
advisable to discover if possible some middle course, in
which an elastic definition of principles and prescribed
allotment of duties may preserve us from both dangers –
undue precipitation and infirmity of purpose.

Briefly, this might take the form of an established
system of rapid ground reconnaissance, a careful
allotment of duties in connection with fire, under the
heads of (1) fire organisation; (2) fire direction; (3) fire
control; (4) fire discipline; a definite system of selecting
targets based on general principles for distribution of
covering fire and concentration of decisive fire, and the
emphasising, by means of musketry conferences, of the
chief means to be employed to secure fire superiority.

The means are specified in the books, but great
things are necessarily mixed with small, and those which
have general application are indistinguishable from
those of limited bearing; fire effect cannot be studied at
manoeuvres; it can best be dealt with – theoretically at
musketry conferences, practically, on rifle ranges.

The preliminary duties of organising a fire fight are
allotted in the regulations to the officer commanding
the attack, but in an operation by a larger force than a
brigade, fire organisation could hardly be carried out
by an officer of higher rank than a brigadier. If this is a
correct assumption, then in battles between divisions or
larger forces, the brigade staff would be responsible for
local ground reconnaissance and other duties specified
in the regulations as a preliminary to the fire fight. These
duties, the training manual points out, include indication
of fire positions for covering fire, allotment of objectives,
verbal explanation of the situation, arrangement of
communication, and the notification of a directing unit or
compass bearing.

If the allotment of objectives should enable battalion
commanders to give a direction point, frontage, and fire
limits to each company, the chief difficulties of company
officers in directing fire will be removed.

The direction point and frontage allotted will prevent
overlapping and consequent loss of fire effect; they will
limit extension, and reduce the tendency to crowd behind
cover; the fire limits will facilitate the application of fire,
and render it much more effective, besides establishing a
means for distribution.

It is suggested than in attacks on intrenched
positions, the following general principles, adapted
to circumstances, might govern concentration and
distribution of fire for decisive or neutralising effect, and
choice of targets generally.

The ground enclosed within the fire limits of each
company would be regarded by that company as its fire
area or sector.

Its primary object would be to subdue the enemy’s
fire within its area, and afterwards to devote so much of
its fire as was not required for this purpose to targets
in an oblique direction, those at or about the points
selected for assault being given preference. Such a
system would ensure that the enemy’s firing line was
everywhere kept under fire, and if full advantage was
taken of the ground to produce the maximum volume of
fire, it should provide also a heavy volume of converging
fire for decisive effect at the point of assault.

A similar system could be adopted in defence, fire
limits being marked by artificial or natural marks placed
a few yards in front of the flanks of companies.

A broad principle of distribution for neutralising
purposes and concentration for decisive effect, with a
system devised for the application of either method
according to prevailing conditions, should solve the
difficulty of selecting targets for tactical reasons, and put
a stop to the unsound practice of firing always at the first
and most visible and easiest targets.

It is noticeable in field practices that when targets
representing an enemy rushing forward in small groups
for a few paces are exposed, fire unit commanders
continually change their objectives and alter their
sighting, but before the sights can be re-adjusted, the
target is gone. If attention is confined to a certain area
of ground, the quick application of fire and judging of
distance is greatly facilitated; there is also less alteration
of sights, and such an allotment of ground, if combined
with a simple system of aiming up or down when there is
no time to alter sights, would certainly render fire more
effective against rushes of small units, such as are now
regarded by all nations as the best method of crossing
the decisive-range zone. It is significant that the Japanese
lost, so we are told, comparatively few men while actually
advancing, most of their casualties occurring during the
halts. It is necessary to adopt some means for taking
advantage of an enemy’s exposure of extra target surface
during these short advances.

It is ordered in the Training Manual that the officer
commanding shall point out peculiarities of ground,
and it may be assumed that he will decide to what extent
open ground and patches of cover are to be permitted to
interfere with fire effect. It is a difficulty of fire fighting
that fire fronts (that portion of a front which is available
for fire purposes) may be limited by either open ground
or cover. If may be thought undesirable to cross the former
under concentrated fire except in widely extended order,
and the latter may obstruct the line of sight. The open ground and thorn bush in Natal illustrated this point; the Japanese are said to have preferred open ground to cover for their attacks.

The case in which the volume of fire is restricted by frontage is one of many in which machine guns will be invaluable.

The necessity for recognizing dead ground both in advance and defence is very obvious, but with increased range and flatter trajectories ought we not to pay more attention to the selection of fire positions, offensive and defensive, with a view to searching dead ground, sweeping reverse slopes, and producing secondary effect with fire aimed at an enemy’s positions?

In no country is there much belief in indirect rifle fire, and in Austria a warning has recently appeared against the tendency to exaggerate its importance; but if the definition of indirect fire be “all fire applied by means of an auxiliary aiming mark,” then several forms of indirect rifle fire must be regarded as of common use in modern fighting. It includes, for instance, night firing, overhead firing from a position behind the foremost firing line, so delivered that an obstruction preserves the first line from injury whilst acting also as an aiming mark, and collective fire which is aimed at any mark with special sighting to cause distribution in depth or breadth.

That form of fire which, being aimed directly at an enemy, passes over his first line and strikes his reserves, is called at Hythe “unaimed fire”, though it is admitted that the term is unsatisfactory. It is not indirect fire, and it is not searching fire. By skillful selection of fire positions, whether in attack or defence, the fire effect obtainable by means of unaimed fire, and the possibilities of utilising overhead fire, may be materially increased.

To sweep a plateau or reverse slope, or to strike with unaimed fire ground on which reserves or material are likely to be placed, necessitates some knowledge of range tables, skilful ground reconnaissance, and rough calculations. The ordinary military plans with form lines and freehand sketches are of little use for such purposes, and it might be worth while to consider the introduction of a quick and accurate method of mapping battlefields. If an officer from each battalion of a brigade were equipped with a good clinometer, and detailed to make a section of the ground between the contending forces, a sufficiently accurate plan could rapidly be made on which to base fire positions gained by night approach, and it seems likely that they will often be detached from regiments in our own service, as was the case in South Africa.

If machine guns are massed with us there is no chain of command; there was none when the guns were massed in South Africa. This would be another duty thrown on the Brigade Staff.

At the present time we have no permanent brigade organisation. Since 1905 the Russians have converted their trained Infantry scouts into mounted scouts – 64 per brigade; would it not conduce to security, co-operation, and effective fire direction, if we possessed permanent brigades, each with a small section of mounted scouts, under a specially qualified officer, charged with arrangements for ground reconnaissance, command of machine guns when massed, and general details of fire organisation? The system of attaching stray mounted details to outpost companies is satisfactory neither to Infantry nor Cavalry. In South Africa a few mounted men were found to be necessary by every Infantry unit, and nothing is more unsatisfactory in war than dependence on strangers for information.

I have considered these details of fire organisation at some length in order to ascertain the nature of the orders and information which may be available under favourable conditions to guide company commanders in the direction of fire in a decisive fire fight.

Besides general information as to the situation, and intentions of the officer commanding, he may hope to be told the objective of his brigade or battalion, the direction point, frontage, and fire limits of his company, the hour approximately at which events will lead to a forward movement or crisis, and the principal means for gaining superiority of fire.

With this knowledge he can judge the risks which must be run to produce surprise effect, and so he and others will regulate the pace of the advance with common knowledge, and in accordance with definite principles. There will be no premature development of fire effect, but if necessary a steady application of neutralising fire, till the advance has gained a fire position from which the targets can be clearly seen and fire concentrated for decisive effect. The requirements of mutual support will have been thought out in advance, and difficulties of ground, whether due to lack of cover, or cover which restricts fire effect, foreseen and guarded against. Formations will be adapted, not only to the ground,
but to the development of maximum fire effect at the critical moment. The application of fire in its technical aspect will be greatly facilitated by rearrangement of objectives and allotment of fire sectors.

The production and application of the volume of fire will not, however, be sufficient to ensure success, unless it be skilfully timed. Desultory fire leads to waste of ammunition; if it is spasmodic and rapid, ammunition may run short; even the fear of shortage in ammunition will lead to want of initiative and co-operation.

Two methods of regulating volume may be mentioned; the watch, which seems to have been used to some extent by the Japanese, and Artillery *rafales*, as used by the French. Either method should facilitate a company commander's task and give him confidence in the support of others. Telephone and semaphore signalling will be less satisfactory from the point of view of the company officer directing fire.

In no respect do company officers differ more widely in the absence of prescription than in the ordering of extended formations; some officers have so high an opinion of marksmanship and the magazine rifle, that they believe in holding positions in open ground with men extended at intervals of 100 paces. To what extent marksmanship can make up for want of numbers is one of the most interesting questions in connection with fire fighting. There can be no doubt of its value provided it is adapted to service conditions, which necessitate shotting and rapid fire; even if, as some contend, there is no aimed fire in a crisis, skill and courage act and react upon one another, and carry a firing line forward; but admitting all this, it must be said that even in peace firing, where conditions are most favourable to marksmanship, expert shots cannot afford to meet greatly superior numbers. If they can be completely concealed, as were individual Boers in river beds and other places, they will be able to derive the advantage of their skill, but in firing lines designed for offence, or intrenchments subjected to heavy fire, their accuracy in shooting will not compensate for lack of volume.

The Japanese, following the German method, indicate a normal interval of two paces, though it is expressly stated that more or less extension may be adopted according to conditions of ground. It is not to be expected that a line extended to four paces could, by superior marksmanship, other things being equal, obtain superiority of fire against a line at two paces interval. It is possible, in view of side winds and other influences, that with superior training, a line extended to three paces might in a similar case be successful; experimental firing produces no overwhelming effect against lines extended to three paces; there can be no better course than to provide superior training in rapid and accurate fire, which, with good fire discipline, may enable a firing line at slightly greater intervals, and therefore with less vulnerability, to produce a more effective volume of fire than a dense line of the enemy.

The Russian officer, Colonel Matynov, tells us that extended lines had insufficient firepower in Manchuria, and the Japanese still employ dense firing lines from the first opening of fire.

Whether we employ lines of equal or less density than those of the enemy, it is quite clear that the moral training of the soldier is not less important than physical exercises. We must not take too much for granted in this respect. Degtyareff, with Manchurian experience, has written in support of the principle which is said to govern masses of men under heavy fire, viz., that safety lies only in advance.

Individual training of the soldier abroad aims at the development of this and similar instincts. The combative qualities are only aroused by heavy losses.

Ranks filled with reservists and young soldiers have not the stiffening of former times. Orloff's disaster was attributed by some to the large proportion of reservists in his command.

We have an advantage in this respect with our long service, but moral training should not be neglected.

Musketry training now receives increased attention abroad. The general tendency is towards field practices, as we call them, and the skilful direction of fire at ranges beyond the limit of fine shooting. Elementary targets are used by France and Germany at distances below 400 metres for short series of shots, under conditions which, at such short ranges, combine practice in grouping and application. They attach no importance to fine judgement of wind, but they expect a good standard of grouping to be attained by all, the courses being so arranged in Germany that a standard must be reached in each practice before progress is permitted. The new Russian musketry training is in strong contrast to this; like others they have recognised the danger of confining practice to elementary targets; their instructional target, possessed of even more pernicious attributes than most instructional targets, has gone, and for preliminary practice figures are used on frames with a small white bullseye.

It is in the matter of distances for practice that they differ from other countries; only 12 rounds are fired at distances below 400 paces; there are classification practices at unknown distances, and in the field practices, firing beyond 2,700 yards. It is impossible not to feel envious of the range accommodation which will permit of such practices being carried out by all corps.

The Japanese regard 600 metres as the limit for instructional practice. All nations devote a large proportion of the annual allowance of ammunition to field practices; some of them seem to be rather pedantic in nature, but definite principles are followed and the double purpose is served of training the men to fire at service targets and testing fire unit commanders in direction of fire.

Features in French training are the complete liberty allowed to company officers in framing their own courses of instructional firing and the musketry conferences which precede and follow collective field practices.

Training for the eyesight and tests in judging distance are given greater prominence year by year; the application of fire demands special exercises in describing and recognising targets. A due sense of proportion is observed with regard to all the subjects of training; there is no tendency to exalt fine shooting under artificial conditions to a place above range finding or judging distance; on the contrary, a high level is aimed at in shooting under moderately difficult conditions, and specialising is encouraged in estimation of range.
Our own great difficulty is want of ground for the study of fire direction and fire effect. If we had ranges of adequate extend we should find that glasses are a necessary part of the equipment of many who now try to direct fire without them.

Rapid and snapshotting are not much practised abroad; conscript soldiers have little time to become proficient in this respect. Rapid loading is encouraged, but not rapid aim.

The Russians and Japanese learned the value of rapid fire in their war; “Slow fire,” says Captain Soloviev, “was never used; my regiment fired 630 rounds per man at Liaoyang.”

Japanese officers tell us that 150 rounds per man are sufficient for a day’s fighting, though it is advisable to carry more; perhaps we may attribute the difference between this estimate and the implied opinion of Captain Soloviev to better regulation of fire on the part of the Japanese.

Rapid fire will generally accomplish as much as slow fire in a shorter time, but with a greater expenditure of ammunition; it needs justification therefore, but must be used at a crisis. Its use may become epidemic, and threaten exhaustion of ammunition supply, unless the application is well timed.

This is one of the many considerations of fire fighting which is overlooked in peace manoeuvres – with blank ammunition there is no volume of fire. The use of rapid fire should, therefore, be carefully taught and practically illustrated during collective field practices.

The French employ heavy bursts of rapid fire with the object of facilitating control, keeping a check on expenditure of ammunition, surprising the enemy before he can take cover, and producing intervals of time for reorganization.

The Germans train every man to fire at his best rate, varying from about eight to three rounds a minute, according to visibility or target, but officers may give the command to fire more quickly or more slowly. “In the war,” says Degtyareff, “we suffered much from lack of training in rapid fire; snapshotting is very necessary. On an average 15 to 38 shots may be fired.”

It is evident that in the near future the volume of fire will be increased, and the importance of ammunition transport correspondingly enhanced; even if automatic rifles are not adopted, machine guns will be used in very large numbers. There need be no fear of overstating the value of these weapons; all tendencies in modern tactics, night fighting, envelopment, avoidance of open ground, cramped fire frontage, cavalry fire action, invisibility and mobile reserves, bring their good qualities more and more into relief.

The Continent is no longer indifferent to the tactical qualities of machine guns. Russia has acquired several hundred Maxims, and Japan has issued regulations founded on Manchurian experience. Official Russian reports describe them as being of enormous value in close fighting.

Their employment at close range would be rendered easier by the provision of small steel shields to protect the firers.

A remarkable point made by a writer who served in Manchuria, was the great falling off in the effect of rifle fire at short range, no harm being done at 150 metres, or less, owing to nerves. It was at such ranges that machine guns were most useful with their nerveless carriages.

Among the difficult problems to be solved in future wars will be that of directing the fire of large numbers of partially trained men, who will probably act according to the instinct of undisiplined men to fire at the most visible target, without regard to the obligations of mutual support.

It will certainly be difficult to concentrate or distribute the fire of irregular troops for tactical purposes. A means of applying fire in such special cases would be available if machine gun detachments of auxiliary units were specially trained. A machine gun is a more difficult weapon to use than a rifle, and its ammunition consumption is an important consideration; the manoeuvring of machine guns requires special training in use of ground and cover. They are weapons of particular value for irregular troops, and some authorities rate one Maxim as equivalent for all purposes to 200 men.

There is no object in going into smaller details of fire training; they are based on principles which are common to all nations. One of the most striking developments of the last 50 years has been that of fire training; it has been less of a change for us than some others, for our traditions of rapid and accurate fire date back nearly 600 years; there is no sign of any finality in the improvement of weapons, though there may be in time a limit to the local value of numerical strength; the chief detriment to proficiency at the present time is perhaps the tendency to regard rifle shooting as a pastime, to be conducted under such conditions as will eliminate every element of difficulty or uncertainty, and enable a few experts to obtain assured return for money expended in new rifle barrels and special appliances unsuited to war.

Discussion

Brigadier-General C.J. Mackenzie, C.B.:
Almost every part of the instructive and valuable lecture we have heard affords matter for discussion. I would refer to one or two points. Colonel McMahon has told us that foreign armies are inclined to think little of the moral value of the bayonet. While it must be admitted that modern rifles render more remote than formerly the chances of opposing forces coming to close quarters, I venture to think that we should be wrong not to assign an important place to the moral, if not the material, value of the bayonet. If skill promotes courage in the use of the bullet, the same should apply to the bayonet. If a man is thoroughly trained in the use of the bayonet, he has more confidence and, hence, more inducement to go forward, and this aspect of the case has particular importance in relation to operations by night. Troops holding the skilfully constructed and concealed trenches of the present day may not readily vacate them under the influence of fire alone; the feeling that the attack makes progress and cannot be kept back must have great effect in shaking resolution, and in these circumstances the knowledge that the attack has bayonets can hardly fail to have a considerable moral effect.

It will be comforting for infantry officers to hear that new ammunition will to a great extent lessen the necessity
for judging distance. We have a weapon of precision in the modern rifle which is usually helpless in ranging for itself, and no attempt has been made to produce a rifle projectile which by the emission of smoke on impact, or similar means, affords any indication of the distance of the target fired at. The fire unit commander has now first to locate the enemy’s trench, no easy matter, then he has to point out this obscure target to his command, which is equally difficult, and finally may expend much ammunition by naming a range which, except in sandy or other special conditions of soil, he has no means of verifying, and which may be 200 yards out. Colonel McMahon has not gone into detail as to the possibilities of the new ammunition, but a point blank range for 1,000 yards would obviate all of the above-mentioned difficulties.

The question of how far definite orders can or should be issued for attack is a very debatable point. A superior commander is hardly justified in issuing a definite order as to the action to be taken by a subordinate at a particular place, unless he is in a position to appreciate the situation at that place as well as the officer to whom the order is issued. The reverse will probably be the case, and a definite order would, in such circumstances, be unadvisable; moreover, a superior commander will seldom have a sufficiently accurate knowledge of the terrain, &c., to be in a position to give such definite orders. Is it not preferable to train officers on correct principles and understanding of the necessities of mutual support, covering fire, and use of ground, and encourage them to use their own judgement and initiative? I consider under the conditions of modern fire better results will be obtained by such a system than by attempting too much direction or too detailed orders from superior commanders.

Brigadier-General F. Lloyd, C.B., D.S.O.:
One point which occurs to me demanding consideration is the extension of the attack. We have had described as a normal formation some two or three paces. If this is so, the last five years’ training we have had here is wrong. General Sir John French has frequently ordered and generally inculcated the idea that very much larger extensions will have to be adopted than that. It was only this last summer I asked him if he still adhered to the principle of ten to fifteen paces and he told me he was as strong as ever on it. If that is so, and we go back to the smaller extension, we shall have to alter many of our ideas. My own experience of service with a larger extension than that was that we had two companies of men completely wiped out. I do not think you could get anywhere near a strongly held fire position with such an extension as that suggested: it will have to be much greater.

I fully agree with my brother Brigadier that if we are to use the bayonet, and use it we are bound to, we ought to highly train the men to it. I think greater facilities should be given in the way of equipment. We have not half the equipment we require. Give us more dummy bayonets and more equipment and then we shall be able to do more. I fully agree with General Mackenzie in regard to the question of initiative. I cannot believe that you can give precise orders and tie the hands of commanding and company officers; you must leave much to their initiative and they must be trained up to it. It is our only chance of making a really fine and effective attack.

Colonel G.G.A. Egerton, C.B., Commandant, School of Musketry:
I think General Mackenzie was a little severe and General Lloyd also on the question whether definite orders should be given as suggested by Colonel McMahon. I think Colonel McMahon only intended to suggest that definite orders should be legislated for in battles of position, and that they pre-supposed a most careful preliminary reconnaissance which on many occasions will be possible and probable. Under these circumstances I agree entirely with Colonel McMahon, that if you can in any way organise your fire beforehand, particularly your covering fire, it will be extremely valuable.

Colonel McMahon spoke of the Russian Regulations; I should like to mention that last week I met an officer who was through the Manchurian campaign from the Yalu to Mukden, and had opportunities of seeing more than even the attachés could. He told me that he had an interesting conversation with General Stackelberg, and that officer told him that he did not care much how the men shot, good or ill, so long as they produced a volume of fire on the definite area which he laid down.

There is one other point referred to by Colonel McMahon – eyesight. We have found lately that we get a good number of officers coming to Hythe who, according to Army Regulations, have normal eyesight, and can pass the medical examination with ease, yet whose sight is not good enough to direct fire at small bodies and difficult objects at ranges over 1,800 – 2,000 yards without glasses. If they provided themselves with glasses that disability would be removed. We have an extraordinary prejudice in our army against wearing glasses on parade, and I think that the question has become rather serious. An officer who possesses fair eyesight, but cannot distinguish clearly individuals at long range, should, I think, be compelled to provide themselves with glasses and to wear them on duty.

I desire to say how thoroughly I agree with Colonel McMahon that much more might be done at field practice by the demonstration of carefully thought-out and prepared practices before the whole unit, such demonstrations being both preceded and followed by conferences on the principles involved.

The Chairman:
Will some one say something about the question of scouting which has been raised in the lecture? Perhaps Colonel Henderson will?

Colonel D. Henderson, D.S.O.:
This is not merely a matter of technical scouting. I think the Lecturer meant sending men forward in battle reconnaissance. In my opinion it must be done by men in action and not by special men. It must be carried out under the direction of officers whose men are actually in action. I do not think that to send any special scouts forward when the Infantry are in action with the enemy will be either useful or desirable, and especially I do not see how mounted men can get in front of the Infantry to scout. It would very rarely be possible; but the Lecturer
may intend these mounted men to be employed under some special arrangement.

If Colonel McMahon would say something about the extension to two or three paces we should be glad. I should understand he meant the employment of an extension of two or three paces when the battle is actually under way and not in order to get over the ground. I cannot conceive what he means that in the beginning of an action the extension should not be more than three paces – that is for the movement forward before the actual fire fight begins.

The Chairman:
Some remarks on the subject of machine guns would be welcome.

Captain A. Bryant, 2nd Gloucestershire Regiment:
During the summer training the machine guns of the 5th Infantry Brigade were massed for purposes of organisation, so that the G.O.C. (General Officer Commanding) could send two or more guns to any point where required. I do not think any opportunity occurred for bringing the eight guns into action in battery.

The Chairman:
Before I ask Colonel McMahon to reply and give further information upon points which have been raised, I wish to say, that I consider this one of the most important lectures ever given here, because it is a lecture which concerns the very essence of the objects of our military training. All our efforts in training the army lead up to the infantry attack, the conduct of infantry fire, and how to get infantry forward, and I think there has seldom been a more important subject bought before our notice.

There has been some discussion as to distribution of orders, and the assignment of zones for the attack. I think that what Colonel McMahon is trying to impress upon us is the necessity for our not repressing but rather directing the initiative of our company officers. We are told that our officers lack initiative, but I deny this. Our company officers are as good as those of any other army and full of initiative. What is wanted is to direct that initiative into suitable channels and to give them general principles to work on, so that all of them, using their initiative, shall work on one set of general principles for the common good. We want to find a mean between formalism and “go as you please.” It seems to me that what is said about laying down sectors for the attack and certain lines of advance should not be taken too literally. It is what is desirable, but in many cases it cannot be done. You often do not know where the enemy is, and he was rarely seen in the last war, but where it can be done, it should be done.

In the matter of these extensions I think the opposed views are absolutely compatible. The preliminary extension must be wide, but the successive extended lines must follow one another in waves so as to build up a powerful firing line at decisive range.

One thing I should plead for is better means of teaching fire control, and one means of accomplishing this would be a larger supply of blank ammunition. In this respect we are terribly short. Some one once said there was nothing more “sham” than a sham fight, and I think there is really nothing more sham than that sort of silence which prevails at our operations. On foreign manœuvre fields you hear a great amount of noise, and at our last manœuvre battle we made a good deal, but it was because we had saved up our ammunition. In our manœuvres we too frequently hear only a “pop” here and a “pop” there, and it is not in the least like the noise of a battle. We want more. The French give a file of men in each section the full amount of war ammunition, and this file fire the whole time as they would on active service and at the same rate, and it gives some idea of what the rate of firing would be and what is usual in the attack in the way of expenditure of ammunition by the men.

Another of our great wants is more field firing ground. If we can get that we can practice fire control. Then about the musketry conference – there is a higher form of conference – the senior officers’ course at Hythe. What I learned there, not being a rifle soldier, was very great, and even an infantry soldier must benefit by it. The more officers attend these senior courses, which are so ably instructed by our Lecturer, the better it will be for the service.

The Lecturer:
General Mackenzie has shown clearly the importance of the bayonet; it is, I believe, the almost universal opinion that bayonet training has become more necessary than ever, but that, I suggest, is due to the loss of its moral effect consequent upon the introduction of the magazine rifle. There is no longer panic when a charge is threatened, the defence is more stubborn, and the bayonet or bomb must be actually used before resistance is finally overcome. Bayonet fighting is, however, very local in its effect, it depends on numbers and close formations, and is no longer a great decisive agent like converging fire, surprise, or overwhelming volume of fire. It is interesting to note how the Russians are meeting the difficulty of the assault. They, like the Germans, have abolished the fire position (about 300 yards from the enemy) whence the assault was prepared, and now continue their advance to within 50 yards before ceasing fire and making a rush with the bayonet. They have introduced an intermediate formation, between close and extended formation, called by the translator “Open order.” In this new formation of serried ranks, they deliver another form of charge in quick time from a distance of 200 or 300 yards, firing during actual movement.

It does not seem probable that the new ammunition will remove the necessity for training in judging distance; it will be less important for the rank and file, but always most necessary for officers and non-commissioned officers. I should have liked to refer more fully to the decisive range limit of rifle fire in connection with the new ammunition. This limit may now, I suppose, be regarded as coincident with that of normal vision in respect of low service targets. The new ammunition may give a “dangerous zone” up to 1,000 yards, sufficiently deep to discount normal error in sighting, but unless the eyesight can be strengthened, it seems that the improvement in weapons has gone beyond the point at which we can derive the greatest advantage from them, for few men can see low service targets beyond 800 yards. Under these circumstances the
increased importance of fire control and collective fire training need hardly be pointed out.

My remarks on normal extension abroad, and the necessity for regulating fire fronts and extension with reference to those of the enemy, have been taken as suggesting the adoption of a maximum extension for all purposes. That was not my intention. Where superiority of fire is a necessary preliminary to movement, it cannot in any ordinary circumstances be obtained with a line extended to 15 paces. Such an extension will favour the employment of converging fire or envelopment when frontage is available, but on a cramped frontage it can scarcely be regarded as a firing formation. A succession of widely extended lines will cross a fire-swept zone quickly and with little vulnerability, but they cannot obtain superiority of fire till a close formation is adopted within decisive range. Under modern conditions of group fighting, there should be increased opportunities for wide extension and envelopment; it would, of course, be very unwise not to take advantage of ample frontage when it exists.

In peace manoeuvres there is no volume of fire, and the umpires can form little idea as to the relative development of fire effect by opposing sides on equal frontages. The proposal to allot fire areas or sectors to companies in position fighting has been severely criticised as tending to formalism, but it will be found that the Japanese practise attack with strictly defined frontage and they are not opponents of decentralisation. The regulations of France and Germany prescribe much more definite methods for distribution of fire than those which I have suggested, and the same point may be made with regard to battlefield reconnaissance. All these nations depurate formalism, but they retain a reasonable prescription for the organisation of a fire-fight in case such organisation may be possible.

The brigade mounted scouts, which seem to me to be necessary, would not be employed in reconnaissance, except with advanced guards and outpost companies. They might be used as escort for machine guns when massed or detached to a distance; the system of attaching men from mounted corps to infantry outpost companies has never been popular with either branch and dependence on strangers for security is never satisfactory.

The massing of machine guns for training purposes has been carried out by some brigades this year; we advocate this course at Hythe, because it provides a means for better supervision, and affords opportunities for certain forms of training which cannot be obtained by detached sections. The proposed musketry conferences would deal with the more advanced theories and practise of fire direction in a way that cannot be adopted when explaining or criticising practices on the range. In France such conferences are held before a unit goes to the field firing area, and again after return from it. As the result, a programme of field practices is prepared, so that each smaller unit may illustrate a theory, or fire an experimental series, for the benefit of all. The greatest benefit is thus obtained for the ammunition expended; there is explanation and discussion beforehand, careful tabulation of results, criticism and discussion afterwards. Results are recorded for subsequent reference.

All this helps junior officers and non-commissioned officers to grasp the principles of fire direction. It is evident that these cannot be correctly learned by only reading books. Hythe experience shows that some misread the books and think that fire should always be concentrated. The resulting tendency is always to fire on the most visible target without regard to tactical conditions. If the principle of distribution for neutralizing and covering fire, and concentration for decisive effect were prescribed to govern selection of targets, there would be less difficulty in carrying out the direction of the training manual to select targets for tactical considerations and not merely for visibility.

On the motion of the Chairman a hearty vote of thanks was accorded to Colonel McMahon for the lecture delivered.
Frederick Von Oppen was Colt’s agent in London, and copies of many of the letters he sent to the parent company in the USA survive in an archive in the NRA Museum at Bisley. They are owned by Jim Hallam and have been transcribed by Richard Milner (see Volume 4, No 5, page 41). They are being published sequentially in this journal.

The following letters cover the period May 1869 until September 1870. The anticipated positive response of the British government to Colt’s metallic cartridge revolver, appears to have turned out to be a polite refusal in favour of the Adams revolver. The correspondence now concentrates itself on advertising placed in a variety of publications, and competition with Adams is a developing theme. Technical matters concerning the functioning of the revolvers and the conversion to breech loaders are touched upon; marketing Europe and the Middle East remain important and there are references to other developments of the time: Chassepot, Montigny mitrailleuse and Gatling. In the context of the current issue of the journal, there is also an interesting reference to the frustration at not being able to get hold of an example of the new Martini Henry rifle. The outbreak of the Franco-Prussian war in July 1870 inevitably involved the company in seeking contracts to supply weapons - to France. It is noteworthy that muzzleloading revolvers; effectively standard in the American Civil War which ended only five years earlier, are by this time considered virtually unsaleable.

No.534
Colt’s Patent FireArms Manufacturing Co.
Office & Depot, 14 Pall Mall, S.W.
London,

May 5th 1869

Gentlemen,
Confirming my respects of 28th ult. I now beg to send you enclosed this Agency’s detailed account of cash for April and the monthly balance sheet dated 1st inst. By this mail I send you seven patent specifications; please credit us in payment for the same and for three sent before, during April with 9/6d, as per enclosed vouchers.

In the “Times” of 30th ult, I marked a report on trials to show that caps in large quantities are not explosive material, and may be forwarded without danger by rail or otherwise.

By this mail I send you the “Overland Mail” of April 30th containing our advertisement, report on trial; Daw v Eley; a notice relating to the Enfield Factory and a statement to the effect that the Chassepot Rifle is to be converted for metallic cartridges.

We now have been as good as promised a notice in the “Times” on the metallic cartridge revolvers, however, more time may still elapse before it appears, when the other papers will take up the matter.

I send you today the “Army and Navy Gazette” of 17th ult in which our new pistols are spoken of. An unfortunate
efflatoun pasha called. in a few weeks he requires from 3 to 400 more navy pistols. this government have not yet decided on a breechloader. he has lately travelled much on the continent on business, so he was at berlin and vienna, where he says, the gatling gun is not in favour; also that the prussian government have adopted a montigny mitrailleur with the rifling gun, bore, bullets of the gatling gun; that is ti say a mixture of both.

we shall send you invoice and debit you with the amount of the iron when the same is paid for and shipping charges have come to hand. it will be consigned care of messrs collins & co and paid to new york.

enclosed please find two letters which i send under same cover to save postage.

yours very respectfully
f. von oppen
agent for colt's p.f.a. mfg., co.

no.544
colt's patent firearms manufacturing co.
office & depot, 14 pall mall, s.w.

july 6th 1869

gentlemen,
in my last to you of 3rd inst i omitted triplicate of bill of lading of the iron, which bill of l. i now enclose, also copy of the report made may 6th '69 by the superintendent of the royal small arms factory, enfield, upon colt's new metallic cartridge pistols "which report is considered very favourable to the principle" of the new pistol to the invention.

we shall send you this specification by next mail.

yours very respectfully
f. von oppen
agent for colt's p.f.a. mfg., co.

no.542
colt's patent firearms manufacturing co.
office & depot, 14 pall mall, s.w.

june 26th 1869

gentlemen,

i beg to confirm my respects of 19th inst. the iron you ordered may 11th is ready and will go forward, we are informed, per "france" (ss) on the 30th inst. i enclose copy of mr. marshall's invoice amounting to £394.12.4 or £2.17.6 more than stated in my letter of may 29th, mr. marshall having sent 275 lb in excess.

by last mail, two days ago, i sent you one patent specification no.3733. by this mail i send you copy of the "star" of 25th inst, and of the "advertizer" of 23rd inst, containing notice on the metallic cartridge pistols. the latter paper is kept in almost every public house, coffee house, inn, tavern and hotel of great britain. – i also send you today's "army & navy gazette" containing article on: breechloading rifles, from which it appears, that the english gov't., mean to adopt a sword bayonet with sawback for the henry and martini rifle.

i mention this, because i had set great store upon this paragraph in the "army & navy gazette" an authority in military matters which paragraph i meant to have copied in many other papers.

however, i mean to have ere long another article in the same paper, and the promised paragraph in the "times" will be an authority to other papers and be copied by them without difficulty.

nothing further to report today, it be then that we are now busy canvassing for orders all our london connections and showing to them our new pistols.

no news as yet from the war office.

by this mail i send you also a knife blade plated with nickel, just now received from mr. j. b. thomson, who write to us that: no articles plated with nickel alone have ever been introduced in trade, that last week a new patent for electroplating with nickel was published no. 3117 of october 10th '68, by which specification he sees that the patentee has had no experience in the matter. – we shall send you this specification by next mail.
No.555  
Colt’s Patent Firearms Manufacturing Co.  
Office & Depot, 14 Pall Mall, S.W.  
London,  
September 7th 1869  

Gentlemen,  
Confirming my respects of 31st ult. I now beg to send you enclosed this Agency’s statement of arms for the three weeks ending 3rd inst; the monthly balance sheet dated 1st inst and the detailed account of cash for August.  
I likewise send by this mail two patent specifications No’s 88 and 3981, the latter being the one for the metallic cartridge pistols, and enclose paragraph of the “Pall Mall Gazette” of 3rd inst, relative to an experimental trial by the English Government to ascertain the comparative merit of the Gatling and Montigny gun. The 5 sample Enfield Rifles safely reached us; one of them has been handed over to the party anxious to have the same, and who promised soon to communicate with us on their subject.  
We sold today 80 Navy pistols, to go forward next week; Efflatoun Pasha has not yet been able to ship those he ordered; we hope he will do so soon. Several minor orders are likewise on hand awaiting shipment. It is difficult to procure a Henry Martini or Tersen Rifle. Messrs Eley even have not been able to obtain any one of the former on loan.  

I remain Gentlemen,  
Yours very respectfully  
F. Von Oppen  
Agent for Colt’s P.F.A. Mfg., Co.

No.569  
Colt’s Patent Firearms Manufacturing Co.  
Office & Depot, 14 Pall Mall, S.W.  
London,  
December 4th 1869  

Gentlemen,  
Since writing to you on the 27th ult, your telegram of 1st inst and favour of 19th ult reached us. Not being able to obtain the information required in your message, I telegraphed to General Franklin that you wanted to know if he had received three telegrams from you. As I have not received any reply I presume he has telegraphed to you direct.  
The “Adams” revolver and cartridges have been ordered and will be forwarded to you as quickly as possible.  
I shall endeavour to obtain the information respecting the order supposed to have been given to the Birmingham Small Arms Co, for Russian Muskets, but from enquiry I have made, do not think they have received one. Enclosed please find invoice of one ton Government iron forwarded by ss “City of Brooklyn” on the 2nd inst, amounting with the freight etc, to £25.8.7 which amount please credit this Agency.  

I am,  
Gentlemen,  
Your obedient Servant,  
J. Lawrence

No.556  
Colt’s Patent Firearms Manufacturing Co.  
Office & Depot, 14 Pall Mall, S.W.  
London,  
September 14th 1869  

Gentlemen,  
Since addressing you on the 7th inst. your favour of the 1st inst reached us, contents of which are carefully noted. We took great pains to obtain a favourable notice on the metallic cartridge pistols in the “Pall Mall Gazette”; all we succeeded in doing was to prevent the Editor from inserting a damaging article already in type and paid for to their military reporter who is a friend of Colonel Boxer and in favour of the Government pattern Adams revolver.  
Mr. Sheldon’s subscription to the “Illustrated L. News” has been stopped; there only was 1/- to pay for No’s 15555 & 56. I shall endeavour to obtain information on the Remington Rifles purchased by Egypt. Several months ago Efflatoun Pasha told me that one of the Remington Company, probably Mr. Remington himself, was in Egypt, that the Minister of War was in favour of his rifles and felt vexed with Efflatoun Pasha for recommending other breechloaders to his Government. If 63/- were paid the Remington Co for their Rifles they will have had a heavy outlay in commissions.  

Enclosed please find this Agency’s statement of arms for the week ending 13th inst during which we delivered 93 arms sold. The 81 arms received were returned to us from Bombay. Please send us 50 metallic cartridge cylinders for converting old model pocket pistols.  

Yours very respectfully  
F. Von Oppen  
Agent for Colt’s P.F.A. Mfg., Co.

No.576  
Colt’s Patent Firearms Manufacturing Co.  
Office & Depot, 14 Pall Mall, S.W.  
London,  
January 8th 1870  

Gentlemen,  
I beg to confirm my respects of 1st inst. Enclosed I hand you copy of an order for 250 Navy metallic cartridge cylinders, which please send us at your earliest convenience. If you cannot send them at once, kindly state when we may expect them. Please credit us with £2.2.7 in payment of patent specifications and postage for the three months ending 31st ult., as per enclosed invoice.
I likewise enclose this Agency’s monthly balance sheet dated 31st ult and the detailed account for the month of December last. Referring to the latter I beg to say that, all advertisements have been stopped, and that we have paid this month through petty cash many tradesmen bills for small amounts.

We have not yet been able to procure the charges on the Adams’s revolver with ammunition sent you, and have written today again to Liverpool about it.

We are at present busy taking stock preparatory to making out the balance sheet for last year.

Mr. Norris, connected with the Remington Co., has taken out an injunction, I understand, against the manufacture of the new Berdan Rifle by the Birmingham Small Arms Co., Mr. Norris owning patents covering, it appears, several points of the gun in question. Efflatoun Pasha purchased through Mr. Norris three .50 bore Gatling guns with carriages complete at 6,600 francs each, but though these guns were on hand in Europe difficulties for the supply of their ammunition.....

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Page copied at an angle and this last few words are cut off.

Yours very respectfully
F. Von Oppen
Agent for Colt’s P.F.A. Mfg., Co.

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**2 untitled pages, without letter heading or date. Written in J. Lawrence’s hand.**

Copy

220 Colt’s new patent Navy size cylinders and rings precisely the same as pistol sent to our London House to fit accurately in every point as the one in Revolver sent.

30 as above but with this exception that the point of the small spring which regulates the ring in its fixing or ejecting position be left full in its projection above the ring and not bevelled as in pattern sent.

These I require for such of the Revolvers that I have to convert which vary in the width of the underpart of the Body, please obtain these at once. Full particulars being given in attached letter, further remarks are unnecessary remarks.

I would suggest (presuming that you have a sample chamber from America) to get a practical man and see if this American chamber will fit the Revolver just sent no doubt it will.

We hand you complete copy of our correspondents remarks to show you how particular he is in the matter.

A guarantee will have to accompany invoice that they will all fit the pattern pistol sent subject to the examination of a practical hand who will try every ring and cylinder and if not perfect in fitting & action to be rejected.

**Remarks received from our Correspondent.**

Wrote to you in Sept last concerning a Contract. I expected to enter into for the conversion of Colt’s original Revolvers to their present new patent in which is used their new metallic central fire cartridges.

The matter is now confirmed through the number is considerably less than I anticipated having through ignorance over estimated their stock in hand, but better few than none.

I now most earnestly beg you will give the execution of this order your most careful & prompt attention as I have received this favour through the influence of Gentlemen who have long patronized me and rely upon my character & ability as a tradesman, and in case of unsatisfactory issue, I must inevitably fall into disgrace and become a considerable looser. I send a Revolver as a sample by this mail having precisely the kind of Cylinder and ring in it that I require. My object in sending the complete weapon is that you may try or cause to be tried every Cylinder & Ring in it and if not perfect both in fitting & action be rejected. To this end I would crave your patience while I suggest a few of the most essential points.

First,

that the cylinder fit well, (that is to say without shaking) on the centre pin.

Second,

that when the cylinder with ring attached is put on the Revolver, the barrel properly placed and the bolt which connects and holds the Barrel to the Body is driven carefully home, that their [sic] is no shaking backwards and forwards or opening between the cylinder and Barrel or Body.

Thirdly,

that the ring in its reversing motion from the firing or ejecting position be correct and when in either position be held firmly by the regulation centre spring between the two fixed checks, which you will observe on the Ring, and Lastly that the chambers or holes in the cylinders be free from Rings holes or flaws, arising from bad metal, tools or any other cause, as if defective the consequence will be that after the cartridges are exploded the metal case expands, takes the form of such hole rings and other defects & wedges thereby rendering the ejector ineffective.

The hole or chambers must be smooth and perfect and the cartridges must fit most correctly and with moderate tightness, as if otherwise the action of firing on the one hand or shaking or jerking consequent of riding on the other, (as the weapon I have to convert are for our mounted Troopers) will in either case be moved forward, causing either a misfire or lockfast, which would be highly annoying and bring the weapon into disrepute. You will not I am sure think the remarks out of place or unnecessary as all of them are important items.

They will have to be made subject to the test of a practical man.
No.601  
Colt’s Patent FireArms Manufacturing Co.  
Office & Depot, 14 Pall Mall, S.W. London,  
May 26th 1870

Gentlemen,

Since addressing you on the 21st your favour of May 12th reached me enclosing another from Genl. Franklin, contents of both of which are carefully noted. For the kindly feelings expressed there in for me I beg (you) to accept my best thanks, and I shall follow the advice you have given me.

The invoices with bills of lading etc, for the 53 cases ex “City of Antwerp”, which left on the 22nd inst per “Memphis” for Alexandria, have been forwarded to Efflatoun Pasha, who is just now out of town, but who, his secretaries, will doubtless send us a cheque for the amount £3458 in a few days.

The landing certificate for these cases cannot be made out till five weeks hence, on the return of the “City of Antwerp”. By this mail I send you patent specifications, No’s 2904; 2970; 3003.

Mr. John Marshall of Wednesbury recently called. He stated that the Birmingham Small Arms Co., have not yet begun the manufacture of arms for the Russian Govt., and that trade had been very dull with him of late.

Mr. Caesar likewise called; he leaves today for the Continent; he stated he had not been able to sell any more of the pistols he has on hand.

I remain, Gentlemen,  
Yours very respectfully  
F. Von Oppen  
Agent for Colt’s P.F.A. Mfg., Co.

No.607  
Colt’s Patent FireArms Manufacturing Co.  
Office & Depot, 14 Pall Mall, S.W.  
London,  
July 2nd 1870

Gentlemen,

Confirming my respects of 25th ult. I now beg to send you enclosed the statement of arms for the four weeks ending 1st inst and the detailed account of cash for the month of June.

By this mail I send you four patent specifications, No’s 3162; 3171; 175; 3258.

We should be very glad soon to receive the shells for the Navy pistol metallic cartridge cylinders; we are much pressed for them. We are now communicating either through their agents here, through correspondents of ours abroad, or direct with all Governments likely to purchase the 5,000 Berdan Rifles, offering at the same time 2,000 of the Navy pistols on hand as a bargain, and Gatling guns to non European Governments. Few Govts., in Europe are likely to purchase the Berdan guns, perhaps Greece, Roumania, Servia, Montenegro; scarcely Holland, Portugal. – More chance appears to exist with Morocco, Tunis, Muscat (Egypt does not want them) also with the Orange Free State and the Transvaal Republic.

We ascertained that the Govts., of the Cape, South Australia, Victoria, N. S. Wales, Queensland and New Zealand either are already provided with similar arms or have already made arrangements for their supply under the advice of the English Government. –We shall offer them through proper channels to China, Japan, Siam, Persia.

We have not yet done anything with the Central and South American States, but generally find that American Consuls are obliging and willing to assist us in offering arms to Governments.

We never fail to send out Drct. Gatlings pamphlets to any Government, Authority or party of influence whenever our so doing is likely to benefit the sale of the gun.

I have not yet learnt whether or not his paper will appear in the U.S. Journal; as soon as a decision has been arrived at I will doubtless be informed.

Yours very respectfully  
F. Von Oppen  
Agent for Colt’s P.F.A. Mfg., Co.

No.612  
Colt’s Patent FireArms Manufacturing Co.  
Office & Depot, 14 Pall Mall, S.W.  
London,  
August 4th 1870

Gentlemen,

Since addressing you on the 30th ult your favour of July 21st reached me, contents of which are carefully noted. I have written today to Mr. Robeson asking him to transmit to the Government of Morocco our offer of all the arms which you have ready for sale, and offering him a commission of 5%.

The circumstance of your being able to turn out 200 additional muskets a day ought greatly facilitate the sale of the 5,000. – We approached the Govt., of Morocco before through two other channels. Having been informed that there are at present in England agents sent by other European Governments to purchase arms, we communicated with all Embassies, Military Attaches, or other agents offering our arms on hand and to manufacture on short notice more thereof it needful.

By next mail we will send you the “Army & Navy Gazette” and the “Broad Arrow” of 6th inst containing our altered advertisement of arms for sale. The latter paper will likewise contain more on the Gatling gun.

In the “Times” of today you will find a long article speaking of the Gatling gun, also of the Adams’s revolver used with explosive bullets. Long ere now I meant to have trials made with explosive bullets shot from Colt’s revolvers, but Gentlemen did not like to ram home such missiles by ramrod.

The article written by Doctr. Gatling on the invention of his gun for the Royal U.S. Inst., Journal will appear in the next number of that periodical, we are informed.

The “Graphic” a high class, at least a popular, illustrated paper here will give an illustration and description of the
Mr. Lawrence will be kept well informed where a letter to London should business make it appear desirable. I have not thought it against your interest to accompany fully posted up with all concerning your business here, and as everything is in order here, and Mr. Lawrence wish I should accompany them, thinking I can be of use, have not as yet heard from him. They have pressed their for 200 guns from Turkey, on the subject of which they to learn what Mr. Broadwell is doing with the contract forthcoming English trial with these weapons, and also interested Governments to send Officers to assist at the see whether they can effect sales of Gatling guns, to the Hague, Karlsruhe, perhaps Vienna and France, to Doctor Gatling arrives. They wish to go to Brussels, for the Continent, expecting to be back by the time in order to save you the cost of an answer by cable. 

accept your silence as your consent to begin the repairs, allowing ample time of this letter reaching you, we may receive no answer from you thereto within two days, you: Repairs of House £ ----- (so much) and we should executed without further delay, and we should telegraph should be pressed by Mrs. Roe to have these repairs £350, or perhaps less.

than was at first expected. The Surveyor thinks this will sewers, these repairs will amount to somewhat more admitting obnoxious gasses into the same from the House, holds from you stipulates, this should be done during the first two months after April 1st. She however, did not wish it to be done then – during the season, which, being over now, makes her insist it should be done without further delay. She has paid her first quarters rent £62.10.0.

We, immediately we came in possession of the House, applied to a surveyor recommended us by the Crown to have a specification drawn up of what work is required. Probably owing to the Surveyor being very occupied with work more profitable to him it took us much time and trouble to get this specification, which I then had to return twice, because he had put down therein more that the terms of the lease required us to do. – Hence a great delay. At present this specification confines itself to the absolutely unavoidable, and the bills of quantities are being made out for six respectable builders, who will after receipt of these documents send in their tenders, the lowest of which will then be accepted, if otherwise found satisfactory, and a copy thereof sent you.

The tenders will be opened in the presence of the Surveyor and myself. Owing to the system of drainage and ventilation of this House having of late become defective and admitting obnoxious gasses into the same from the sewers, these repairs will amount to somewhat more than was at first expected. The Surveyor thinks this will amount in all, as far as he can say at present, to about £350, or perhaps less.

My object in writing to you now is, that in case we should be pressed by Mrs. Roe to have these repairs executed without further delay, and we should telegraph you: Repairs of House £ ----- (so much) and we should receive no answer from you thereto within two days, allowing ample time of this letter reaching you, we may accept your silence as your consent to begin the repairs, in order to save you the cost of an answer by cable.

Mr. Talbot and General Love are leaving this evening for the Continent, expecting to be back by the time Doctor Gatling arrives. They wish to go to Brussels, the Hague, Karlsruhe, perhaps Vienna and France, to see whether they can effect sales of Gatling guns, to interested Governments to send Officers to assist at the forth coming English trial with these weapons, and also to learn what Mr. Broadwell is doing with the contract for 200 guns from Turkey, on the subject of which they have not as yet heard from him. They have pressed their wish I should accompany them, thinking I can be of use, and as everything is in order here, and Mr. Lawrence fully posted up with all concerning your business here, I have not thought it against your interest to accompany them, at their expense of course, but shall at once return to London should business make it appear desirable. Mr. Lawrence will be kept well informed where a letter or telegram will at any time reach one, he will open all letters that come from you to me and write or telegraph you whenever the occasion calls for it.

I of course will endeavour to dispose of any small arms you have in stock, while on the Continent, and see whether there is an opening for business.

In ten days I hope to be back here.

I remain,
Yours very respectfully
F. Von Oppen
Agent for Colt’s P.F.A. Mfg., Co.

______________________________
No.619 Colt’s Patent FireArms Manufacturing Co.
Office & Depot, 14 Pall Mall, S.W.
London,
September 24th 1870

Gentlemen,
Since addressing you on the 17th I have your favour of 9th inst and expect hourly your answer to my telegram of yesterday. I meant to have written more frequently of late, but expecting every day to sign a contract I postponed writing to inform you of a sale.

France means for the present to fight on, and I have full reason to believe I will have sold within about one week all your Russian, Springfield and Enfield Rifles. I would have done so ere now had they been in England; I am here in direct communication with three bonafide agents sent over by French Departments for the purchase of arms, which agents have approved of the pattern; the money is voted in France and will shortly be here; other lots of breechloading arms which were ready in England have been paid for and shipped.

As to revolvers the agents have instructions to purchase metallic cartridge pistols only, if possible double action; our pistols therefore stand but a very small chance of being taken by the French, the agents and Committees having in most cases returned to us the samples submitted to them.

Two days ago we sent you two pat. specifications No’s 144; & 160, also the “Revire Militaire Francaise” for September...................remainder of letter is missing

______________________________
No.620 Colt’s Patent FireArms Manufacturing Co.
Office & Depot, 14 Pall Mall, S.W.
London,
September 27th 1870

Gentlemen,

Confirming my respects of 24th inst I telegraphed you yesterday advising you to send all your Rifles – no pistols – with one million Berdan cartridges over to Liverpool, this being, according to all we have experienced, your only chance of selling them at present
in France. The arms being in America hitherto invariably frightened the purchaser, uncertain when the war will end, and give a deciding advantage to holders of arms in Europe, especially in England and Belgium, all the more as Chassepot’s, Snider’s and Remington’s are almost exclusively asked for, though other patterns are taken in default of those mentioned. Your sending the arms to Liverpool, keeping samples in Hartford, would not prevent your selling them over there should an opportunity offer. I know very well, you may incur(sic) the expense of sending the arms over here without thereby selling them, but this according to the present resolve of the French to carry on the war to the knife seems unlikely, on the other hand we might obtain a higher price for the arms here ready for immediate delivery than if on other side, requiring a comparatively long time ere they could be got into France.

Single action powder and ball pistols, also revolving Rifles seem now nearly unsalable in Europe; they seen, and are considered here unsafe merchandize. It is doubtfull (sic) whether it is not advisable to clear your stock of Navy pistols even at a very moderate profit. Remington pistols have been glutting the market here at 24 and 25 shillings apiece for the last five years without that any considerable amount of them has been sold. Perhaps the Russian Government might find it a good investment to take all your Navy pistols at a bargain for the Cossacks or other troops.

I of course only speak as my European experience has though me to think, and you may have many non European Customers for powder and ball pistols of whom I do not know.

The greatest objection buyers made to the Russian Muskets was that I could not promise to ship together with them, and at once, one million Berdan cartridges; their price was also objected to; this uncertainty about one million cartridges being ready for immediate shipment in one case may have prevented their sale and must be my excuse for having sent you several telegrams on the subject.

Ere advising you by telegram to send the Rifles to Liverpool, to facilitate their sale, I asked Mr. Talbott’s opinion on the subject and he also thought it best to send them over here.

In yesterday’s “Times” I marked a notice referring to the intention of the English Government to introduce Mitrailleuse into their service.

Yours very respectfully
F. Von Oppen
Agent for Colt’s P.F.A. Mfg., Co.

Continuation of Letter No.621 (First part missing)

Colt’s Patent FireArms Manufacturing Co.
Office & Depot, 14 Pall Mall, S.W.
London,

September 29th 1870

Gentlemen,
A notice in today’s “Times”, which I enclose will also show you that the exportation of War Material from England to France is not likely to be interfered with in future by the Government of this country.

I hesitated the less to invite you by telegram to send the arms with ammunition to Liverpool, Rifles, not the pistols, as the French make difficulties to buy the arms ere they see them also because there is reason to believe that the war cannot end soon; because it is certain the Germans will not make peace unless acquiring thereby Alsace and German Lorraine, and that the French will not cede these provinces as long as they have strength and power to fight on.

I enclose note from Mr. Talbott.
We sent over to you parcel containing 50 copies of Dctr. Gatling’s lecture on machine guns.

I would telegraph to you again that I cannot sell your Rifles unless sent over here with one million Berdan cartridges, but think it likely you may have reasons of which I know nothing to prevent your doing so.

The Committee examined today the mechanical construction & parts of the Gatling gun and according to General Love seemed highly pleased, & want to know how soon fifty of them could be supplied.

Yours very respectfully
F. Von Oppen
Agent for Colt’s P.F.A. Mfg., Co.

p.s. We sent you just now the following telegram: “Name earliest day you can deliver fifty Gatlings forty five calibre Russian model also four sixty five calibre for England. Early delivery essential. Also.......remainder missing.