

## SCIENCE OF SIEGE WARFARE IN INDIA DURING THE GREAT MUTINY: 1857-58

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Siege warfare could be defined as the art of capturing forts as well as the techniques involved in defending fortified strongholds. The history of siege warfare from ancient times onwards is a continuous dialectics between developments of offensive weapons for destroying fortifications, which in turn resulted in the innovative modifications of fortress architecture. The East India Company's (hereafter EIC) Army deployed in India imported the new techniques of scientific siege warfare which emerged in south and west Europe during the early modern era. By making a case study of two sieges conducted by the EIC's Army during the Great Mutiny, this paper attempts to show that British success was due to the systematic use of firepower and associated technologies in a scientific manner. Cavalry played a marginal role in siege operations. The central components in siege operations were the military engineers with sappers and miners and then the artillery branch. In scientific siege warfare picks and shovels played an equally important role like the mortars and howitzers. The rebels unlike the EIC lacked an engineering branch and a corps of sappers and miners. The British infantry had a technical edge over the rebels in the sphere of hand held firearms. Both in Delhi and Lucknow, shortages of guns forced the rebels to rely on inefficient traditional guns. In the final analysis, superior hardware and the technical skill in using them properly enabled the EIC to overwhelm the numerically superior rebels.

**Key words:** Bastion, Colin Campbell, Delhi, Delhi Field Force (DFF), East India Company (EIC), Engineers, Howitzer, Lucknow, Mortar, Parallel, Sappers and Miners.

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### INTRODUCTION

Siege warfare could be defined as the art of capturing forts as well as the techniques involved in defending fortified strongholds. The history of siege warfare from ancient times onwards is a continuous dialectics between developments of offensive weapons for destroying fortifications which in turn resulted in the innovative modifications of fortress architecture. The East India Company's (hereafter EIC) Army deployed in India imported the new techniques of scientific siege warfare which emerged in south and west Europe during the early modern era. By making a case study of two sieges conducted by the EIC's Army during the Great Mutiny, this paper attempts to show that British success was due to the systematic use of firepower and associated technologies in a scientific manner.

### THEORY OF SCIENTIFIC SIEGE WARFARE IN EARLY MODERN EUROPE: 1450-1750

Gunpowder artillery made the vertical walled stone castles of the Middle Ages obsolete.<sup>1</sup> In response, innovations in fortress architecture occurred. West and South Europe experienced an 'Artillery-Fortress Revolution' in the early modern age. A new style of fortress (known as *trace italienne* or *alla moderna*) was created in Italy during the late fifteenth and sixteenth century. This new design of fortress architecture then spread to West Europe. The new system of fortification which emerged in West Europe in order to resist bombardment had to trade height for the star shaped sloping design. The principle was that the sloping rampart was better suited to absorb the impact of cannon balls.<sup>2</sup>

The medieval square and round towers left 'dead zones' in which the besiegers found shelter from the defending fire. The new architectural style comprised of angular bastion (arrowhead shaped artillery tower) which stood forward of the walls and dominated the ditch or moat and served as a fire platform for both cannon and firearms. The most suitable design proved to have four faces. The two faces formed a wedge that pointed out so as to present a glancing surface to enemy fire. The bastion was built of stone or brick, backed and filled with rammed earth. It was a solid structure which provided a cannon platform for the defenders and against which the attackers' shots made the least possible impression. Raised gun platforms known as cavaliers were constructed on the ramparts and the bastions. From the cavaliers, the defenders used cannon and firearms to sweep the ditch and the stretches of wall between the bastions.

Thus, the bastion eliminated the 'dead zones'. The bastion fortress was a scientific construction which meant that the design was arrived at by mathematical calculation of how best to minimize the wall area that the attackers' shot could strike and to maximize the area of open ground outside it that defending fire could sweep.<sup>3</sup>

Further modifications occurred with the passage of time. The slope of earth from the ditch to the masonry was known as the scarp. And the space opposite of the scarp across the ditch was known as counter-scarp. Constructing these two slopes resulted in deepening and widening of the ditch which became known as the moat or the fosse. Water filled ditches was preferred compared to the drier ones because the former impeded the digging of mines by the besiegers. On the inside of the masonry wall there was another bank of earth, of which the slope was known as talus. At the top of it was the ramp or walk with a banquette of fire step from which the soldiers could fire their muskets over the parapet. There was a position halfway down the scarp from which the musketeers operated behind a low wall known as the cordon. On the far side of the ditch the earth rose in the counter-scarp at the top of which was another rampart walk, firestep and parapet. This was known as the covered way. From this parapet towards the besieging force was a gentle slope known as the glacis. Fire from the inner parapet was directed to graze the slope of the glacis.<sup>4</sup> The sixteenth century witnessed the emergence of ravelins (flankless pointed artillery platforms) which were built along the walls between the towers. Casemates with steeply angled firing ports in the towers and in the sides of the ravelins created zones of defensive cross-fire.<sup>5</sup>

In late seventeenth century, Sebastien le Pestre de Vauban (1633-1707), the French military engineer made skilful use of the bastion and enfilading fire. Vauban placed the main burden of defence of the fortresses on artillery.<sup>6</sup> For Vauban, the trace or outline of the fort was to be polygonal, or octagonal, quadrangular or even triangular. He emphasized greater use of detached exterior defences. He gradually introduced certain modifications. The curtains (section of wall or rampart between the towers or bastions) were lengthened and instead of bastions, small works or towers at the angles were constructed which were covered by detached bastions constructed in the ditch. Next, the curtain was modified in shape to make increased use of cannon in defence, and the towers along with the detached bastions were increased in size.<sup>7</sup>

Vauban was also concerned with how to capture an artillery fortress. He came up with trenches that moved forward by successive parallels and zigzag

approach in order to minimize exposure to the forts' artillery.<sup>8</sup> The trenches of the besiegers could not take the shortest possible line to the fort. They needed to zigzag every few dozen yards to prevent the fort's artillery from enfilading them and firing down their length.<sup>9</sup> Vauban's system of attack was as follows. The assailants gathered their men and stores beyond the range of the fort's cannons. At this point the sappers started digging a trench that moved slowly towards the fort. After this had progressed to some distance, a deep trench paralleling the point of future attack was flung out at right angles to the trench of approach. This was known as first parallel and filled with men and materials. From it the trench of approach moved forward again, zigzagging as it approached the fort. After it had advanced to a certain distance, the second parallel was constructed and the trench moved forward once more, until a third and final parallel was constructed to a short distance from the foot of the glacis of the enemy fort. The trench was pushed ahead still further, the sappers timing their approach so as to reach the foot of the glacis just as the third parallel was occupied by the troops. The dangerous task of advancing up the glacis while exposed to the fire of the fort's defenders was accomplished with the aid of temporary structures called *cavaliers de tranches* which were high earthworks provided with a parapet from which the besiegers fired at the defenders of the fort. Further, the defenders of the fort were subjected to ricochet bombardment or by sending up grenadiers to take the position by assault under cover of a protecting fire from the *cavaliers de tranches*. Once the enemy's covered way was seized, siege batteries were erected and an attempt was made to breach the fort's main defence.<sup>10</sup> The guns were shielded by wickerwork gabions filled with earth to absorb the impact of the heavy shots.<sup>11</sup> Vauban invented the principle of ricochet fire where the propelling charge was reduced so that after striking the target area the ball would rebound and would be a peril to the men and machines nearby.<sup>12</sup>

Vauban's Dutch counterpart Menno von Coehorn (1641-1704) made use of high trajectory fire with explosive bombs to attack the forts. In the 1690s, the Dutch started to use lighter howitzers known as mortars.<sup>13</sup> The fire plan of the attackers was to concentrate adequate amount of heavy artillery in order to batter the bastions into rubble and to fill the ditch with this rubble and then launch an infantry assault over the filled ditch against the fort.<sup>14</sup> In response, the defenders further elaborated their defence network. Behind the breach, the defenders of a fort constructed a defensive trench known as *retirata*, a retrenchment or a half moon. From it and also from the windows of the houses overlooking the breach,

the defenders were posted with firearms to fire point blank at the assaulting columns crossing the breach. In order to take a fortress by storm, thousands of pioneers were required to fill the gabions, dig redoubts, and for construction of firing platforms and trenches.<sup>15</sup>

Now let us turn the focus to the two famous sieges conducted in India by the EIC during 1857 and 1858 respectively to see how far the British implemented the science of siege warfare as developed in early modern Europe. We can also assess how far the 'rebels', many of whom were deserters from the EIC's Bengal Army, had been able to learn the scientific siege techniques which their white masters once taught them.

### **THE SIEGE OF DELHI: JUNE–SEPTEMBER 1857**

In Delhi, three Indian infantry regiments were stationed and they mutinied.<sup>16</sup> About 2,000 Sikh soldiers also joined them.<sup>17</sup> On 8 June 1857, the Delhi Field Force (henceforth DFF) under Major-General Henry Barnard the Crimean veteran occupied the ridge in front of Delhi.<sup>18</sup> On the western side of Delhi, there were outlying spurs of the Aravalli Mountains, which represented a low ridge that disappeared at its intersection with river Jamuna 2 miles from the fort. Outside the city were present a cluster of old buildings, covered with thick brushwood and occasional clumps of forest trees.<sup>19</sup> The operation of the DFF lasted from 8 June 1857 till 20 September of that year.<sup>20</sup> The DFF had two tasks: first to guard the ridge and defend itself from the rebels and secondly to build up strength gradually for assaulting Delhi. From time to time, while the DFF got reinforcements from Punjab, the rebels inside Delhi got reinforcements from the region mainly east of the city.

#### **Guarding the Ridge: July-August 1857**

During the first five weeks, the DFF suffered several attacks from the rebels. Not only the rebel attacks were defeated, but the DFF also erected various batteries. During the first four weeks, the officers of the DFF debated whether the city could be captured by assault by means of escalade and blowing in the gates. But, this plan was postponed due to the high risks involved.<sup>21</sup> The DFF's defensive zone extended from the picket at Metcalfe's House near the river on the left, along the ridge facing the north side of Delhi till the *Sabzimandi* suburb at the right of the British position. Here, the ridge ended at a distance of 1,500 yards from the city.<sup>22</sup>

The *Bādshāhī* Army (rebels) repeatedly launched attacks to dislodge the DFF from the ridge. The British response was to check the rebels by heavy gunfire from the batteries stationed at the ridge and then to launch counter-attacks. However, when the DFF's counter-attacking party comprising of infantry, cavalry and light artillery pursued the rebels near the city, the guns mounted on the walls of Delhi Fort caused rampage among the former. The net result was an *impasse* till the end of August. Let us analyze some of these engagements in detail.

On 9 July, the *Bādshāhī* Army attacked the DFF and the latter suffered 200 killed. The *Bādshāhī* Army suffered 500 casualties.<sup>23</sup> Another attack by the *Bādshāhī* Army occurred on 14 July. As the British gunfire from the ridge failed to deter the personnel of the *Bādshāhī* Army, a column under Brigadier Showers comprising of 6 horse artillery guns, 1<sup>st</sup> Fusiliers, Punjab Rifles, and a few sowars from the Guides Cavalry and Hodson's Horse moved forward and pursued the rebels towards the city. When the DFF's detachment neared the city walls, the rebel guns inside the city opened up with anti-personnel grape at a range of 1,100 yards. Then, Showers' troops retreated back to the ridge. The DFF suffered 208 casualties. The *Bādshāhī* Army suffered about 1,000 casualties.<sup>24</sup> On the dawn of 12 August 1857, the DFF with 1,150 men and 6 guns attacked on its left the rebels' advanced post where the latter had brought guns and started annoying the Metcalfe Pickets. In the ensuing encounter, the rebels lost 4 guns (one a 6-pounder and another a 24-pounder howitzer) and 30 artillery horses. Many rebel gunners were bayoneted.<sup>25</sup> About a massive rebel attack launched on 12 August 1857, the British intelligence report stated: 'On the morning of the 12<sup>th</sup> the Mutineers attempted to annoy our camp at Delhi by a discharge of rockets. After firing about 70 outside the walls of the city.... During the night several unsuccessful attacks were made on our picket at Metcalfe's Stables.'<sup>26</sup> On 25 August, an insurgent force of 3,000 attacked the DFF and suffered 10% casualties.<sup>27</sup> On 27 August at daytime, about 50 rebel sowars advanced within 50 yards of the Salked's Battery. They were repulsed by men armed with Minie rifle. As a result, the DFF suffered only 12 casualties in this attack.<sup>28</sup>

Besides fending off rebel attacks, the DFF constructed several earthworks and batteries for defending itself and to harass the rebels. After Barnard's death, Archdale Wilson took command. The DFF occupied the 'Sammy's House', a small temple to the right of Hindu Rao's house and the Crow's Nest, a high pinnacle of rock in the same direction. Picked marksmen of the 68<sup>th</sup> Rifles were placed in these defensive positions and not a rebel dared to expose himself. The

rebels carried on musketry fire all along the day and night but were astonished by the long range of Enfield rifles used by their opponents.<sup>29</sup> During August, the DFF concentrated on the collection of materials for the engineer park and the sappers and pioneers practiced in the construction of experimental batteries.<sup>30</sup> The DFF had 110 engineers under Lieutenant-Colonel Baird Smith.<sup>31</sup> Baird Smith had about 100 Indian sappers who were engaged in making trenches, breast-works, repairing the batteries, and finally constructing gabions and fascines from brushwood.<sup>32</sup> On 22 August, the DFF shifted towards offensive operations. On 27 August, a battery for 6 light guns was constructed to sweep the ground between the Sami House, the Shah Bastion and the Kabul Gate. This battery was built on a rocky position and carts brought the necessary earth.<sup>33</sup>

Despite enjoying numerical superiority, the rebels not only failed to dislodge the DFF from the ridge but also suffered greater casualties than their opponents in each of the encounters. This is because of the DFF's use of combined arms tactics involving infantry and cavalry with organic artillery support, superiority in constructing field embankments and availability of better hand held firearms. In contrast, the rebel command lacked the skill to successfully launch combined arms forces. To give an example on 27 August rebel cavalry attacked without support from their infantry and artillery. On 5 September, the siege train with heavy guns and mortars, which was fitted out at Ferozepur Arsenal reached the camp of DFF. Then, the DFF prepared for bombarding the city.<sup>34</sup>

### **The Assault of the Delhi City: 4-20 September 1857**

#### *The Bombardment*

Ironically, the British engineers modernized the defensive structures of Delhi after Lord Lake captured the city from the Marathas in 1803.<sup>35</sup> And the rebels took advantage of this. The eastern side of the city rested on river Jamuna which functioned as a wet ditch. The rest three sides of the city required protection. Delhi was protected by 7 miles of wall 40 feet in height with 10 massive gates and numerous gun emplacements. A ditch 30 feet wide and 35 feet deep surrounded the wall. The wall was surmounted by a parapet 8 feet high and 3 feet thick with embrasures for musket fire. And there were gun emplacements at the circular bastions with 9 to 12 guns each. The bastions projected from the curtain wall at close intervals.<sup>36</sup> In total, the rebels mounted 114 pieces of heavy artillery on the walls of Delhi.<sup>37</sup>

The outworks were limited to one crown work at the Ajmir Gate and martello towers which mounted a single gun at such points which required additional flanking fire to that given by the guns stationed on the bastions themselves. The bastions were generally small mounting 3 guns in each face, 2 in each flank and 1 in the embrasure at the salient. They were provided with masonry parapets about 12 feet in thickness and had a relief of about 16 feet above the plane of the site. The curtain consisted of a simple masonry wall or rampart, 16 feet in height, 11 feet thick at the top and 15 feet at the bottom. The main wall (8 feet in height and 3 feet in thickness) had a parapet loop holed for musketry. The whole of the land front was covered by a berm whose width varied between 16 to 30 feet and had a scarp wall 8 feet high.<sup>38</sup> Exterior to this was the dry ditch. The counter-scarp was an earthen slope which was easy to descend. The glacis was a very short one which extended only 50 to 60 yards from the counter-scarp.<sup>39</sup> The rebel garrison numbered roughly 30,000 men.<sup>40</sup> On 2 September 1857, the effective strength of the DFF amounted to 9,091 men.<sup>41</sup>

Before the assault, Alexander Taylor made surveys in order to make maps of Delhi for the DFF.<sup>42</sup> The attack, he rightly noted, could only be made on the northern side of the city along the Mori, Kashmir and Water Bastions and the curtain walls connecting them. These connecting curtain walls were mainly parapets, wide enough only for the musketeers to fire from them. The rebels, asserts historian John Kaye, could have strengthened the defence by pulling down the adjacent buildings and on their ruins creating a rampart, from which they could have poured fire from heavy guns continuously. This neglect on part of the rebel leadership enabled the DFF to concentrate on the curtain a fire which was sufficient enough to crush the defenders' fire and effect breaches through which infantry assaults were launched against the town. The Chief Engineer's plan was to crush the defenders' guns at the Mori Bastion located at the northwest of Delhi city. Then, an advance was to be made to the extreme left, which was covered by the river, and from this position an assault against the city was planned.<sup>43</sup>

Between 4 to 7 September, the British siege tactics was to establish more gun batteries for undertaking offensive action against the fortifications of the city.<sup>44</sup> On 8 September, the DFF captured Qudasia Bāgh (which was only 320 yards from the city wall) and Ludlow Castle. The British fortified Ludlow Castle and constructed a battery there.<sup>45</sup> Under the cover of artillery fire, the infantry was pushed forward to get possession of the ground near the wall of Delhi.<sup>46</sup> Next, the artillery in larger number was pushed closer to the wall.<sup>47</sup> On 7 September,

**Table 1. Nature and Number of the Siege Guns at the disposal of the Delhi Field Force**

| Description of Ordnance | In Position or Park | Siege Train from Ferozepur | Total |
|-------------------------|---------------------|----------------------------|-------|
| 24-pounders             | 5                   | 6                          | 11    |
| 18-pounders             | 11                  | 8                          | 19    |
| 10-inch howitzers       | 11                  | 2                          | 13    |
| 8-inch howitzers        | 2                   | 4                          | 6     |
| 10-inch mortars         | 2                   | 4                          | 6     |
| 8-inch mortars          | 6                   | 4                          | 10    |
| 5.5-inch mortars        | 12                  | 4                          | 16    |
| Total                   | 49                  | 32                         | 81    |

Source: Col. H.M. Vibart (ed), "Journal of the Siege Operations against the Mutineers at Delhi in 1857," *Papers on Subjects connected with the Duties of the Corps of Royal Engineers*, 23 (1897) 126.

the construction of the siege batteries started and they were ready by 12. Then, the final bombardment started.

The Sami House Battery was constructed and given the task of covering the right flank of British line and creating the impression that the attack would be delivered along the Mori Bastion. The *Number 1* Siege Battery with five 18-pounder guns and one 8-inch howitzer was given the task of destroying the Mori Bastion located at a distance of 700 yards. This would prevent flanking fire by the rebels on the advancing assault columns of the DFF. At the round tower between Mori Bastion and Kabul Gate, the *Bādshāhī* Army had a 12-pounder iron gun. The guns at the Mori Bastion consisted of two 24-pounder iron guns, two 18-pounder iron guns, one 12-pounder iron gun, one 6-pounder brass gun, two 10-inch mortars and one 8-inch mortar. The *Number 2* Breaching Battery with nine 24-pounder guns and two 18-pounder guns and seven 8-inch howitzers was ordered to destroy the Kashmir Bastion and breach the wall near the Kashmir Gate. The gunners were ordered to destroy 200 yards of parapets on either side of the breach in order to deny the rebel infantry any cover. The *Number 3* Breaching Battery with six 18 pounder guns and twelve 5.5-inch Coehorn mortars was sited 200 yards from the wall with the objective of making a breach near the Water Bastion. Near the Water Bastion, the *Bādshāhī* Army had one 32-pounder iron gun, two 24-pounder iron guns, one 12-pounder iron gun, one 10-inch mortar, three 8-inch mortars and one 5.5-inch mortar. Finally, the *Number 4* Battery with four 10-inch and six 8-inch mortars was brought into anti-personnel

action. They were to fire over the curtain wall and in the neighbouring localities in order to prevent the rebels from taking shelter behind the wall.<sup>48</sup>

Each battery was protected by sandbags and fascines made of dry brushwood. On 7 September, while the right section of the battery blazed at Mori Bastion, the 24-pounders on the left section under Major Kaye directed their attention towards the Kashmir Bastion. This firing continued both during night and day till the noon of 10 September.<sup>49</sup> In the morning of 11 September, due to the firing from Number 3 Breaching Battery, the curtain and stones on the Kashmir Bastion started collapsing. When the rebel cannons (one 24-pounder, two 18-pounders, one 12-pounder, one 6-pounder, two 10-inch howitzers, two 10-inch mortars and four 8-inch mortars) stationed at the Kashmir Bastion tried to reply, they were silenced by counter-battery fire.<sup>50</sup> By 13 September, the breaches were considered practicable and the infantry assault was delivered on the morning of 14 September.<sup>51</sup> The garrison continued to fire rockets from one of their martello towers and maintained musketry fire from the city's wall.<sup>52</sup>

### *Urban Warfare*

The infantry for assaulting the city was organized in five columns. The *First Column* was ordered to storm the breach near the Kashmir Bastion and to escalate the face of the bastion. The *Second Column* was ordered to storm the breach in the Water Bastion. The objective of the *Third Column* was to blow open the Kashmir Gate and then assault it. The *Fourth Column* was to assault the suburb of Kishanganj and enter the Lahore Gate.<sup>53</sup> The *Fifth Column* functioned as a reserve. The *Bādshāhī* Army tried to defend the streets by stationing 35 pieces (12- & 9-pounder guns, 24-pounder howitzers and 10-inch mortars).<sup>54</sup> By 13 September, the strength of the *Bādshāhī* Army fell to 10,000 men due to continuous casualties and desertions.<sup>55</sup> On 14 September, during the day of the assault, the riflemen advanced to cover the heads of the columns by skirmishing.<sup>56</sup> On 14 September, the *Bādshāhī* Army continued to pour grape and round shot from the Lahore Gate.<sup>57</sup> The DFF's assault on 14 September resulted in 1,175 casualties among its personnel.<sup>58</sup> On 15 September, several mortars were placed within the city to shell the town and the palace. The magazine was stormed by HM's 61<sup>st</sup>, Wilde's Punjabis and the Baluchis. The rebels evacuated Kishanganj leaving behind 5 guns.<sup>59</sup> On 19 September, a party of British troops rushed from Kabul Gate and captured the Burn Bastion. On the same day, General Bakht Khan, the rebel military commander evacuated Delhi through the Lahore Gate. On 20 September, the *Bādshāh* was captured.<sup>60</sup>

Between 7 and 20 September, the rebel forces suffered 1,500 killed.<sup>61</sup> Between 15 to 20 September, during the mopping up operation, the DFF's casualties numbered only 177.<sup>62</sup> In the DFF, rather than infantry and cavalry, artillery and the engineering branch suffered the greatest number of casualties (in percentage terms). The total casualties of the engineers came to about 17.8% of their total strength. The total casualties of the artillery branch were 26% of their strength.<sup>63</sup> From the casualty figures, one could argue that the artillery and the engineers played the most important role in siege warfare. After the fall of Delhi, the British concentrated on rebel held Lucknow.

### **THE SIEGE OF LUCKNOW: MARCH 1858**

The Siege of Lucknow involved roughly three phases: the defence of the Residency by the British against the rebels, Colin Campbells' (Commander-in-Chief of British-India) incursion into Lucknow in November 1857 and then the final storming of Lucknow by Sir Colin in March 1858. Here, we will concentrate on the third and final campaign which finally resulted in recapture of the city for the EIC.

#### **The Assault of the City**

The city of Lucknow situated on the right bank of river Gomti from east to west, was 5 miles in length and its extreme width at the west side was 1.5 miles. The city gradually tapered to the eastern side where its width was less than a mile. There were two bridges: one Iron Bridge and another Masonry Bridge over Gomti. A canal enclosed the city from east and south side. The city could be approached from the west side but even this region was intersected with numerous ravines. There were certain important strong points inside the city. The Kaiser Bagh (Royal Garden) about 400 yards square contained several tombs and buildings. The Machhi Bhawan was a ruined ancient fort which commanded the Masonry Bridge situated on its southern side.<sup>64</sup> The Imambarah and a range of buildings stretched from the Kaiser Bagh eastwards towards the canal. On the east side of the city beyond the canal was the Martinere building and the eastern suburb was known as Dilkhusa House.<sup>65</sup>

By February 1858, there were 24 rebel regular infantry regiments within the city.<sup>66</sup> The rebels constructed a three tier defence of the city. They placed a battery of 3 guns at Hazrat Ganj. This was their outer line of defence which ran

along the Char Bagh Bridge located about 3,000 yards to the west of the Dilkhusa Bridge. The second line of defence ran along the Imambarah, Mess House and the Moti Mahal. The third or the inner line of defence ran along the Kaiser Bagh. In total, the rebels had 100 guns. All the streets within the city were barricaded and all the principal buildings were loop holed and their entrances blocked. Many houses inside the city were protected with mud walls and parapets occasionally mounting guns. The rebels in front of La Martiniere building dug numerous trenches.<sup>67</sup> The rebel strategy was to concentrate their guns once the principal axis of British advance became certain. Further, they decided to defend the outer line for some time and then fall back inside the centre of the city and take advantage of the narrow streets and dense urban growth which would reduce mobility and maneuverability of British heavy artillery.<sup>68</sup>

The Siege of Lucknow started on 2 March 1858, when Colin Campbell encamped on the east side of Dilkhusa Park on the right bank of Gomti. Next day, Campbell established his headquarter in the gardens at Bibipur.<sup>69</sup> Brigadier R. Napier commanding the Engineer Brigade had exact knowledge about the rebel strong points inside the city thanks to the excellent survey of the city done previously by Lieutenant Moorsoom of HM's 52<sup>nd</sup> Regiment and collection of intelligence data by the spies attached with Major-General James Outram. Two Indian collaborators Kanogi Lal and Puran maintained a network of Indian spies. Lal and Puran passed up the information about the location and nature of the rebels' defensive position to Captain Orr and Captain Weston, attached to the Intelligence Department of Outram. Napier decided that it was better to advance from the eastern side of the city by battering rebel fortifications with heavy guns. An attempt to enter into the city through the crowded and densely built western side would result in the EIC's troops getting involved in heavy hand to hand struggle inside the narrow streets filled with apartments, where the firepower of the British heavy guns could not be used properly. Campbells' force deployed the guns of both the Naval Brigade and the Artillery Park. The Naval Brigade possessed 6 8-inch guns, 8 24-pounders and 2 8-inch howitzers. The Artillery Park possessed 8 24-pounders, 8 18-pounders, 4 10-inch howitzers, 6 8-inch howitzers and 43 mortars. The mortars were used for vertical fire in order to kill the rebel personnel who took shelter inside the defensive enclosures.<sup>70</sup>

After taking up a position in the Dilkhusa Park, direct fire was brought on the rebel fortifications in the rear of the canal. The rebel fortifications on the left bank of Gomti were also enfiladed. This resulted in the collapse of the rebels'

outer defence line. Then, the British captured the Bank's House and decided to reduce the strongpoint named Begum's Palace. The buildings adjoining the Begum's Palace extended upto the Kaiser Bagh.<sup>71</sup>

The interval between the arrival of the Engineer Park at Alam Bagh and the beginning of attack was spent in preparing a large supply of gabions and fascines and perfecting cask bridges and practicing in rapid construction of batteries, field powder magazines, etc by the pioneers and the sappers under the direction of the engineers. A battery consisting of 6 guns was placed in front of the Dilkhusa House to neutralize the rebel guns posted at their outer line of defence and to check the rebel plan of advancing guns on the northern angle of La Martiniere. Two bridges of casks of 135 feet in length each were constructed by 5 March with the aid of the sappers and miners above the Gomti below the Dilkhusa House.<sup>72</sup> On 6 March, Outram's division comprising of 7,000 men crossed to the left bank of Dilkhusa and encamped on the Fyzabad Road. On 7 March, it was supplied with the following ordnance: four 24-pounders, four 18-pounders, four 8-inch howitzers, five 10-inch mortars, and ten 8-inch mortars. The rebels attacked Outram's force but were repulsed.<sup>73</sup> On 8 March, a battery of 10 guns was constructed at Kokrail Bridge to command the rebel position at Race Stand. On 9 March, Outram occupied the left bank till the Badshah Bagh. The Martiniere was captured on the afternoon of 9 March with little loss.<sup>74</sup>

During the morning of 9 March, Lieutenant Lang with 200 Mazbi sappers were employed in making a road through the rebels' first line of defence. In the afternoon of 9 March, the rebels abandoned their outermost line of defence which was occupied by General Lugard's Division. In the morning of 10 March, a battery comprising of four 24-pounders, two 8-inch howitzers and five 8-inch mortars was constructed on the left of Badshah Bagh and engaged in counter-battery fire against the rebel guns between the Badshah Bagh and Kaiser Bagh and then shelled Bank's House. The latter was then occupied quickly.<sup>75</sup> Then, a battery of 4 guns and 8 mortars was constructed near Bank's House to shell the Begum's Palace. In addition, one 8-inch gun and one 8-inch howitzer of the Naval Brigade and six 5.5-inch mortars were directed to fire against the Begum's Palace and the bastion in front of the Hazrat Ganj. Roadways for guns were made through the Badshah Bagh and Dilaram House. During the night, a battery comprising two 24-pounders and two 8-inch howitzers and 5 mortars was erected in front of Badshah Bagh and opened fire at Kaiser Bagh. Due to shelling throughout the night, two breaches were made on the wall of the Begum's Palace and its interior

was then shelled. This fortified centre was taken by an infantry assault at 3.30 PM 11 September. On the morning of 11 March, the European Barracks and Kudum Rusul were also occupied. As a result, the rebels' second line of defence which ran along the Begum's Palace and Bank's House was pierced. A battery comprising two 24-pounders was opened on the north side of the Iron Bridge to subdue the enemy's fire from the opposite side of the bridge and to command the Stone Bridge.<sup>76</sup>

On 12 March, six 8-inch mortars and five 10-inch mortars were directed to fire at the buildings between the Badshah Bagh and the Kaiser Bagh. The rebels continued to fire muskets from the Imambarah.<sup>77</sup> In response, on the morning of 13, a battery comprising one 8-inch and one 24-pounder gun were placed only 70 yards away from the Imambarah. Later four 5.5-inch mortars, eighteen 8-inch mortars, nine 10-inch mortars, four 24-pounders, two 10-inch howitzers, three 24-pounders, one 8-inch howitzer from the Badshah Bagh and one 8-inch howitzer, and three 24-pounders from the Iron Bridge were directed to fire at the buildings between the Imambarah and the Kaiser Bagh. During the night of 13 and 14 March, the technique of bombardment of the Imambarah was as follows: two discharges of round shot were followed by the shell and then grape. The shots were designed to disable rebel guns and fortifications and the grape for killing the rebel military personnel. On 14 March, the breaches at the Imambarah were widened which was then captured by launching an infantry assault.<sup>78</sup> A party of 100 Sikhs formed the storming party followed by sappers with powder bags and 32 men of the 23<sup>rd</sup> Company with scaling ladders, crow bars, axes etc. They were supported by 200 infantry followed again by 50 sappers with ladders and tools.<sup>79</sup> Close cooperation between infantry, sappers and pioneers characterized Campbell's operation.

By 15 March, the EIC's forces captured the Chuttaer Manzil and the Kaiser Bagh. On that day, the duty of the engineers was to check the fire in the city and to destroy the gunpowder which was left behind by the rebels.<sup>80</sup> On the morning of 16<sup>th</sup>, Outram crossed the Gomti by the bridge of casks and occupied the Residency, Iron Bridge, Machhi Bhawan and the Stone Bridge. Six 8-inch mortars at the Imambarah and five 10-inch mortars at the Residency maintained bombardment of the enemy's position inside the city throughout the night till the morning of 17 March. From this time onwards, small pockets of rebel troops had to be dislodged from the suburbs. What followed then was small unit cleaning operations against the rebels scattered in penny packets across the various parts

of the city.<sup>81</sup> On 19 March, Outram occupied the Musa Bagh and inflicted 500 casualties on the rebels besides capturing 12 guns. By 21 March, Lucknow was totally cleared of the rebels.<sup>82</sup>

### **Techniques of Urban Combat**

Campbell developed a sophisticated doctrine for destroying the rebel strong points inside the city. When medium artillery breached the rebel held fortified buildings, the rebels attempted to reply with musketry in order to prevent the sappers from enlarging the breaches for smooth advance of the EIC's infantry assault. However, the rebel musketeers were dislodged by grape fire from the British guns.<sup>83</sup> The EIC's cavalry proved to be vulnerable in street fighting. But, then the situation was saved by artillery. Captain G. Allgood the Assistant Quartermaster-General describes one such scenario during Campbells' November (1857) campaign in Lucknow:

The moment was critical, for our advance guard (partly composed of cavalry) was jammed up in the narrow street which would scarcely admit of artillery and infantry passing. It was, moreover, expected every minute that a direct fire would be opened on us down the lane up which we were advancing. A troop of horse artillery was on the advance guard. The Commander-in-Chief at once turned a 12-pounder howitzer to sweep the lane, and set a party of sappers to work to loop-hole the houses facing towards the Secundra Bāgh, and the gun was run out to an opening leading towards the bagh. The cavalry adroitly got into the side lanes and allowed the infantry and guns to pass. The heavy guns and infantry were ordered up with all haste to the front.<sup>84</sup>

A typical British advance involving cooperation between the artillery branch, sappers and miners under the engineers and the infantry as made in the environs of *Begum Kothi* on 12 March 1858 is described by Lieutenant-Colonel Lennox in the following words:

A heavy fire of shells was kept up on the buildings to be attacked, while the Engineers were employed in forming openings through the walls: holes were at first made by blasts in the walls, or by charges under them; these charges were small for fear of bringing down the upper parts of the walls, the removal of rubbish from which would have caused additional labour and loss of time. When once holes were made through the walls, they were enlarged into practicable openings by means of crowbars, pickaxes, etc. Small parties were then moved through and secured the newly gained ground. The windows of the prominent adjacent buildings were provided with sand-bags, and the parapets and other walls loopholed; and from these positions our riflemen kept down the fire of the enemy.<sup>85</sup>

Occasionally Campbell's soldiers ascended the roofs of the buildings and shot at the fleeing rebels.<sup>86</sup>

**SIEGE WARFARE OF THE GREAT MUTINY COMPARED AND CONTRASTED  
WITH SIEGE WARFARE OUTSIDE INDIA**

The 24-pounder as a siege piece was used during the American War of Independence.<sup>87</sup> In October 1854, at Sevastopol, the Russian battery at the Malakoff Tower had 18 guns (most are 56-pounders and the rest 32-pounders). The range of the 56-pounder was 3,200 yards.<sup>88</sup> The British Chapman's Battery had 24-pounders, 8-inch Lancasters and 10-inch mortars. The Gordon's Battery besides these types of guns also had 7 32-pounders. Each Lancaster weighted 95 cwt. and was capable of firing a 68-pounder shot. The Lancaster could also sink a war ship.<sup>89</sup> Colonel George Cadogan describes the awesome Lancaster in his own words: 'It is constructed on a new principle for heavy ordnance. Its peculiarity consists in the bore being oval; the ball, or rather shell, is near 18-inches in length, of conical shape, and contains an exploding charge of 12 lbs. of powder. Its range is pretty accurate at 3,600 yards, rather over two miles!'<sup>90</sup> In the sieges of Great Mutiny, the British used the 24-pounders but not the heavier versions.

In 1863, during the Siege of Vicksburg, the Confederate's entrenched camp was 4 miles in length and 2 miles in breadth, and its outer line of works extended for 7 miles. It is to be noted that the walls of Delhi also extended for 7 miles. Campbell in Lucknow had to cover the city whose extent was about 5 miles. Grant's lines were twice as long as that of the Confederates. Moreover, he had to prepare his rear against attack because Johnston was concentrating a powerful army in the neighbourhood of Canton. A line of circumvallation was dug and one of contravallation was also constructed. The latter line was held by Sherman with 30,000 men. In late June 1863, Grant's army near Vicksburg numbered 71,141 men and 248 guns. On 4 July 1863, the 31,000 strong Confederate garrison at Vicksburg surrendered.<sup>91</sup> In comparison, the DFF's strength never exceeded 10,000 personnel. According to George W. Forrest, from 30 May till 20 September 1857, the DFF's casualties numbered 3,500.<sup>92</sup> Frederick Roberts gave a higher figure of casualties. During the assault of the city, the DFF (exclusive of the Jhind and Kashmir Contingents) suffered 3,385 casualties. Thus, we see that heavier and larger numbers of siege guns were used in Crimea and in the American Civil War compared to the Great Mutiny. And the number of combatants deployed both by the besiegers and the besieged during the sieges of

the Great Mutiny were much less than the sieges in Crimea and in the New World. Cadogan a British staff officer who fought in the Crimean War noted that trained gunners were required for proper elevation of the barrel, putting the exact charge and proper length of fuze. The engineers deserve credit, writes Cadogan, for constructing the trenches in an efficient manner which provided good cover to the British infantry and the gunners.<sup>93</sup> The rebels lacked trained gunners and engineers.

### CONCLUSION

Unlike Delhi, Lucknow had no fort for the British to occupy. During the Siege of Lucknow, the chief obstacles were the series of fortified strongholds inside the densely packed city. Cavalry played a marginal role in siege operations. The central components in siege operations were the military engineers with sappers and miners and then the artillery branch. The sappers and miners played a very important role in preparing fire platforms, artificial covers for the guns and gunners, making roads and bridges for the movement of heavy artillery. So, it could be argued that in scientific siege warfare picks and shovels played equally important role as the mortars and howitzers. The rebels unlike the EIC lacked an engineering branch and a dedicated corps of sappers and miners. Besides shots from the artillery, sniping with muskets and especially rifles proved to be the principal killer during close quarter combat. The British infantry had a definite technical edge over the rebels in the sphere of hand held firearms. The Bengal infantry deserters had smoothbore Brown Bess muskets. And the rest of the rebel infantry was equipped with matchlocks. Even the Brown Bess muskets were inferior in accuracy and range than the Minie and the Enfields in the hands of the Tommies. During the Siege of Lucknow the basic British tactic was to use medium artillery to blast the static rebel strong points and then to occupy them by launching an infantry assault. Compared to Lucknow, in Delhi, the rebels were lucky to possess guns captured from the British magazine. Both in Delhi and Lucknow, shortages of guns forced the rebels to rely on inefficient traditional guns. Hence, the rebels were forced to use rockets, a traditional weapon of pre-colonial India. The rockets were not as lethal and accurate as the guns, mortars and howitzers. As regards information warfare, the British had a definite edge. While Indian spies in British employment roamed through rebel position and reported the tactical information to the British high command, the rebels were not only lax regarding their military plans and deployment but remained in dark about the intentions and strength of

the British plans. In the final analysis, superior hardware and the technical skill in using them properly enabled the EIC to overwhelm the numerically superior rebels.

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