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# The Ottoman Gunpowder Empire and the Composite Bow

## **Abstract**

The Ottoman Empire is known today as a major Gunpowder Empire, famous for its prevalent use of this staple of modern warfare as early as the sixteenth century. However, when Ogier Ghiselin de Busbecq visited Constantinople from 1554 to 1562, gunpowder was not used by the Sipahi cavalry who stubbornly, it seems, insisted on continuing to use the composite bow that the Turks had been using for centuries. This continued, despite their fear of European cavalry who used “small muskets” against them on raids. Was this a good idea? Was the composite bow a match or contemporary handheld firearms? Were Turkish tactics incompatible with firearms to the point that the Ottomans would have lost their effectiveness on the battlefield? Could the Ottoman Empire even be considered a Gunpowder Empire with such a refusal?

## **Keywords**

Ottoman Empire, Gunpowder Empire, composite bow, Ogier Ghiselin de Busbecq

## The Ottoman Gunpowder Empire and the Composite Bow

Nathan Lanan

The Ottoman Empire is known today as a major Gunpowder Empire, famous for its prevalent use of this staple of modern warfare as early as the sixteenth century.<sup>1</sup> However, when Ogier Ghiselin de Busbecq visited Constantinople from 1554 to 1562, gunpowder was not used by the Sipahi cavalry who stubbornly, it seems, insisted on continuing to use the composite bow that the Turks had been using for centuries. This continued, despite their fear of European cavalry who used “small muskets” against them on raids. Was this a good idea? Was the composite bow a match for contemporary handheld firearms? Were Turkish tactics incompatible with firearms to the point that the Ottomans would have lost their effectiveness on the battlefield? Could the Ottoman Empire even be considered a Gunpowder Empire with such a refusal?

Busbecq says of the Turks that “no nation has shown less reluctance to adopt the useful inventions of others.”<sup>2</sup> This was proven by their use of gunpowder; Mehmed II Fatih famously used massive cannons to batter down the walls of Constantinople in 1453, when gunpowder weapons were just beginning to gain their potency.<sup>3</sup> Mehmed even equipped some of his Janissary infantry with primitive handguns, including early muskets and mortars<sup>4</sup> By Busbecq’s trips to Constantinople in the middle of the sixteenth century, the Ottoman military was equipped with the most firearms in Europe, their disciplined infantry and often foreign, mercenary artillerymen being best suited to gunpowder weapons. Indeed, until the turn of the seventeenth century, the Ottoman Empire was at the forefront of military technology.<sup>5</sup>

This makes it all the more shocking when Busbecq tells of a group Sipahis, landowning cavalymen, refusing firearms in his third letter home to his friend. He was in Constantinople at

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<sup>1</sup> Marshall G.S. Hodgson, *The Venture Of Islam Volume 3: The Gunpowder Empires and Modern Times* (Chicago: The University of Chicago Press, 1974), 99.

<sup>2</sup> Ogier Ghiselin de Busbecq, *The Turkish Letters*, trans. Edward Seymour Forster (Baton Rouge: Louisiana State University Press, 2008), 135.

<sup>3</sup> William H. McNeill, *The Age of Gunpowder Empires: 1450-1850* (Washington D.C.: American Historical Association: 1989), 33.

<sup>4</sup> Godfrey Goodwin, *The Janissaries* (London: Saqi Essentials, 2006), 69.

<sup>5</sup> McNeill, 33.

the time, performing his duty as the Austrian ambassador to the Ottoman Empire. As Busbecq observed, after a small band of Christians decimated a larger force of Turks by using muskets, Roostem Pasha ordered that 200 Sipahis should learn to use small muskets from horseback. This idea was quickly abandoned when, according to Busbecq, the muskets became unreliable and the soldiers were embarrassed by how dirty they became while using them. They went back to using more primitive composite bows instead. This is despite the fact that Busbecq quotes a Turkish messenger as wholly understanding the ability of the muskets to “harness fire” and rout the Muslim forces. One would think that, if the Ottomans understood the power of the musket, they would have forced the 200 Sipahis to take care of their weaponry and continue learning to use the muskets regardless of their own thoughts and worries. Busbecq’s story suggests that there was more to the matter.<sup>6</sup>

The basic requirement for the use of each weapon was creating them; if either weapon was too expensive or time-consuming to make, or not durable enough to withstand multiple conflicts, it could be a detriment to the cavalry. The process of making a bow was incredibly time-consuming and required the best materials available. For the highest quality bows, glue that was made either from tendons or a combination of the ears or hide of cattle and skin from the roof of the mouth of a Danube sturgeon, had to be cooked. The most common wood used as the base of the bow was maple because of its ability to accept the glue. Excellent bowyers knew exactly where and when to find the best trees to use to obtain this wood. Horn that is appropriate for the bow must be smooth and free of imperfections and the pieces for the top and bottom limbs of the bow must be identical. The bow is covered on the opposite side by sinew. Assembling the bow is a rigorous multi-step process in which the bow is repeatedly heated and cooled while the bowyer applies glue in many different layers, adding in the horn and sinew at various points in the years-long procedure. The final steps include reflexing the bow to the point that it resembles a pretzel and applying sinew so that the bow will tend to return to that shape, and then stringing the bow and going through a final shaping process to increase its efficiency. All told, making a high-quality bow that would be powerful, efficient and durable could take anywhere from five to ten years including several periods during which the bowyer leaves the

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<sup>6</sup> De Busbecq, 122-125.

bow to dry.<sup>7</sup>

Compared to such a lengthy and complicated process, firearms of the time might seem simple. Two different firing mechanisms existed during the mid-sixteenth century: the matchlock and the wheellock. The matchlock which had been around for over a hundred years by the time of Busbecq was still the most reliable method of firing a gun. It consisted of relatively fewer pieces than the composite bow, and featured a simpler construction. The firing mechanism consisted of two simple lever mechanisms. The first was a trigger made of a long metal bar that was on the outside of the gun. When squeezed toward the gun, the trigger forced the other end of the lever, which was inside of the gun, down. When the lever was lowered, it twisted an arm on the outside of the gun, which held a smouldering string, into a pan of gunpowder. The powder burned through a hole in the barrel and ignited the powder behind the projectile, forcing it out of the front of the barrel. There were very few main parts: a trigger that screwed into a lever that was braced against a spring and forced down on a pin attached to the arm holding the string. All of these were, all of which were attached to a metal assembly on the outside of the gun that also held the priming pan for the gunpowder and a cap to cover the priming pan before it was ready to fire. All of these parts could be fashioned more easily than the natural components of the composite bow.<sup>8</sup>

The other, significantly more complicated firing mechanism was the wheellock, which was inspired by German clockworks. This worked by winding a spring tightly (using a separate key) that was attached to a wheel<sup>9</sup>. The spring had to be wound just the right amount or it would either snap or not work properly. The wheel was serrated and a piece of pyrite rested on top of it, near the priming pan. When the trigger was pulled it released the spring and caused the wheel to spin rapidly and grind against the pyrite, sending sparks into the priming pan, which was opened by the pull of the trigger. This mechanism required far more moving parts than the matchlock, and needed a trained specialist to make, making it more expensive than the matchlock. Both matchlock and wheellock guns consisted of metal barrels attached to wooden stocks. The barrel consisted of just a metal tube, capped at one end, with a hole on the right side

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<sup>7</sup> Paul E. Klopsteg, *Turkish Archery and the Composite Bow* (Evanston: self-published, 1947), 36-53.

<sup>8</sup> William Reid, *Arms Through the Ages* (New York: Harper & Row, 1976), 59-61.

<sup>9</sup> Robert L. O'Connell, *Soul of the Sword* (New York: The Free Press, 2002), 121.

which lined up with the priming pan on the firing mechanism. The wooden stock held all of the pieces together and required little work but to shape it, carving out areas for the inner workings of the firing mechanism, and affix it to the barrel and mechanism.<sup>10</sup>

Considering only the ease of construction and the value of the work in composite bows, matchlock guns and wheellock guns, it would seem that the best weapon with which to equip the Ottoman cavalry would be the matchlock gun. The composite bow is time consuming to create and very expensive due to the amount of specialization required in its construction; furthermore its design disallowed any repairs, should the bow be damaged. The wheellock gun was also very complicated and required a great deal of specialization and little margin of error in its design, which made it too expensive to construct and repair. The matchlock was the least complex in its construction and had the simplest parts, thus making it both the cheapest to produce and the easiest to repair.

The next important factor was the training and equipment required to fire each weapon. Busbecq described the Turks' training in the use of the composite bow. He said that they began training as early as seven or eight years old and continued for up to twelve years in order to build up accuracy. The power in the bow required its user to build strength in his arms in order to pull the string back far enough to fire, something which took years of experience to control. Also, in order to fire, the archer needed a thumb ring for his right thumb as the thumb held the string while the other fingers braced it and the tremendous power of the bow would injure the thumb if it was not protected.<sup>11</sup> This ring was normally made of horn but could also be made out of bone or ivory. A Turkish archer might have also used a *siper*, a device that was strapped to the left hand in order to guide the arrow. Unlike in Western archery, the arrow was held on the right side of the bow and Turkish bows, though smaller, typically had a longer draw length than Western bows. The *siper* guided the arrow so that a shorter arrow could be used with a bow of longer draw length without the bow interfering with the path of the arrow. The *siper* allowed the arrow to come up to three inches inside of the bow and yet still be guided along the outside of the bow, putting more power into the shot<sup>12</sup>. Ammunition for a bow was simple. While the arrows

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<sup>10</sup> Reid, 90-96.

<sup>11</sup> De Busbecq, 133-135.

<sup>12</sup> Klopsteg, 59-68.

used by Turkish archers were highly specialized, they had major advantages over the shot used by firearms: arrows could be reused and required only the power of the bow to take flight.<sup>13</sup>

Guns in the middle of the sixteenth century, whether matchlock or wheellock, were single shot. They required the shot (usually made of iron which was strong enough to pierce armor) and the powder (in a very specific amount) to be loaded into the gun separately and then rammed in with a ramrod. While on foot, with larger guns, this task was much simpler than while on the back of a moving horse with only one available hand and constant movement. A matchlock lit the powder via a smouldering string that could not be openly burning because it would deteriorate too quickly, but could also not go out. If the gun needed to be ready to fire, the string was always lit. Once the gun was loaded, the soldier had to first move the cap protecting the priming pan by hand and then pull the trigger to fire the gun. There were many variables. The string could go out, or the powder could spill from the priming pan. The matchlock, additionally, was not one hundred percent reliable. The burning string also prevented it from being holstered for fear of burning one's clothes, and made it more difficult to use from horseback; the air moving at high speeds around it could blow it out. The wheellock solved these problems, though it had problems of its own. There was no open flame to extinguish, so the soldiers could use it in the rain or on horseback. The lack of flame also allowed it to be holstered, so gun makers shortened the barrels for ease of holstering, which also made them easier to use on horseback. The wheellock, however, required a key to be wound, meaning that if a soldier lost his key, he could not fire the gun, and there was still a chance that the sparks would not ignite the powder, causing a misfire.

While both guns and composite bows were difficult to use, bows required more training, but required less materials to use. While an upstart might not be able to pull the bow or aim perfectly, he would only require a thumb ring and a *siper* to fire arrows that he could re-use later. While it would take some time to learn to load a gun, the amount of materials required would be greater as the powder and shot can only be used once. Bows, at the time, were more reliable than guns; one shot was fired for every arrow that was put on the string until the string broke, while a gun might misfire if it was in good repair.

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<sup>13</sup> Ibid., 74.

The next important aspect of the weapons was their respective effectiveness as weapons. The first of these qualities was range. While at a closed shooting range, famous Turkish archers could reach distances in excess of 900 yards, with some lesser archers reaching 625 yards.<sup>14</sup> Although not every shot reached these remarkable distances, this shows the impressive distance these bows could fire. Matchlocks, in stark contrast, were effective to a hundred yards at best; smaller wheellocks were at even more of a disadvantage.<sup>15</sup> This low range was due to the poor aerodynamics of the shot, a simple iron ball, and the inefficient early design of the gun which allowed much of the energy from the powder to escape without affecting the ball. The composite bow, with maximum ranges at least six times those of the musket, was a long-range weapon.

Another important quality was rate of fire. In order to fire a matchlock, the following steps had to be taken: pour powder into muzzle (made easier by the use of bandoliers of pre-measured powder flasks), place ball into muzzle, remove ramrod, use ramrod to pack ball and powder tightly, replace ramrod, level gun, pour additional powder into priming pan (being sure to keep the burning string away from the powder; a wheellock had the additional step of winding the wheel with a key to just the right tension) and pull the trigger.<sup>16</sup> Firing a single-shot gun is a time-consuming process. A composite bow, on the other hand, required only the following steps: retrieve an arrow, place it against the right side of the bow simultaneously with pushing the nock against the bow string, hold the arrow in place with the left hand and the tension of the bow string, grip the string (utilizing the thumb grip that requires the thumb ring), pull and release.<sup>17</sup> Either process, with practice, can be accelerated, though there are only six steps to firing a bow versus eight or nine steps to firing a gun. The steps to firing a bow could also be performed more as many of the steps to firing a gun involved precise placement of exact amounts of powder and safe conduct with said powder. The steps to firing a bow involve less minute placement and the bow is less of a threat until the last two steps. A composite bow was capable of a much higher rate of fire than a gun.

The next weapon quality was accuracy. On a closed shooting range, at a much shorter

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<sup>14</sup> Ibid., 25-32.

<sup>15</sup> R.G. Grant, *Weapon: A Visual History of Arms and Armor* (London: DK, 2006), 150-151.

<sup>16</sup> O'Connell, 120-121; R.G. Grant, *Warrior: A Visual History of the Fighting Man* (London: DK, 2007), 132.

<sup>17</sup> Klopsteg, 91-105.



distance than their maximum range (10 yards), Turkish archers were deadly accurate. According to Busbecq, they could surround a target the size of a Thaler (large German coin) with five or six arrows so that all of them were touching the outside of the target but none broke the border. Busbecq also said that an archer could “pierce a man’s eye or any other part that is vulnerable” in the stress of battle.<sup>18</sup> Busbecq later described the Turks practicing the “Parthian shot,” in which they galloped by a target and, once past it, quickly turned in their saddle and fired an arrow into the target.<sup>19</sup> So, even on the back of a moving horse, facing backwards, the composite bow can be very accurate in practiced hands. Guns of the time were not as accurate. As the ball had to be smaller than the bore of the barrel, it could bounce around inside of the barrel, causing it to fly off course upon exiting the barrel. The very shape of the ball increased drag so that its path could very easily be disrupted by air resistance during its flight. Factors such as these meant that it was very difficult to duplicate a shot; even an experienced soldier was likely to make an errant shot. Because of this, composite bows were more accurate than firearms.

Perhaps the most crucial quality of a weapon in battle was power. The draw weight of a composite bow tended to be around 65 pounds, though the bows that Busbecq handled were apparently heavier.<sup>20</sup> This meant that, when an arrow was launched from the bow, 65 pounds of force or more were focused directly on the tip of the arrow. While this is powerful, a gun could cause more damage. Gunpowder gave more force to the projectile which, rather than being a clean point or sharp blade like an arrow, was a blunt ball. So while an arrow would cut into a soldier, causing him to bleed and making him lose some of his battle lust, a gunshot would tear a gaping wound that caused incredible pain and was very difficult to heal. A gun shot was normally immediately crippling and nearly always fatal.<sup>21</sup> Guns had the potential to be more lethal than composite bows.

One final weapon quality was solely a gun’s advantage over a bow: psychology. Guns of the mid-sixteenth century were incredibly loud and sprayed smoke and fire with each shot. Compared to a silent bow that soldiers had seen for thousands of years, a gun was absolutely terrifying. While the gunner could miss due to the gun’s low accuracy and range, he would still

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<sup>18</sup> De Busbecq, 133.

<sup>19</sup> Ibid., 137.

<sup>20</sup> De Busbecq, 133; Klopsteg, 40.

<sup>21</sup> O’Connell 120.

succeed in defeating his opponent by taking away his heart for battle. “If battle constituted hell on earth, then why not fire and brimstone?”<sup>22</sup>

More important than the qualities of an individual weapon was the way it was used on the battlefield. Turkish tactics were exemplified at the battle of Mohacz in 1526. Suleyman had 70,000 to 200,000 lightly armored troops (accounts differ) against 30,000 elite, noble, Hungarian cavalry.<sup>23</sup> The Hungarian cavalry was heavily armored so that they could slam like a wrecking ball into Suleyman’s troops and carve their way to the Sultan himself. They were so strong and invulnerable that none of Suleyman’s lightly armored men could stop them. So, Suleyman did not try to stop them. He arrayed his army into three groups with himself at the rear where he could survey the entire battle. When the Hungarians charged, the Turks’ front ranks parted and let them through, an age-old steppe fighting technique. When the Hungarians barreled into the middle of Suleyman’s army, the front Ottoman ranks turned and fired into their rear. The Hungarians pushed to the point that they almost killed Suleyman, but the Janissaries rescued him. Surrounded and pelted by arrows, the Hungarians broke and retreated. Using their superior range and speed, the Turks pursued and destroyed many Hungarian soldiers. Turkish tactics relied on avoiding direct hand to hand combat and releasing arrow after arrow into the enemy. This was why the Parthian shot was ingrained into a young archer’s training; the shot was designed to shoot while avoiding the enemy. In this way, the enemy would be weakened enough that, should a charge be necessary, the enemy would suffer far greater losses than the Turks.<sup>24</sup>

The tactics of Western cavalry armed with guns were similar, though different in purpose. Some of the earliest maneuvers included waiting for a charge, then firing a volley into the attacking forces and countercharging. A variation included retreating in order to reload and returning to fire another volley. Another maneuver was guarding the flanks of the army with pistol-armed cavalry who would advance to within a hundred paces of the enemy and fire volleys, retreating to reload as they went until they were safely within their own forces. When two forces, both of which were armed with pistols, met, they would skirmish each other.<sup>25</sup>

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<sup>22</sup> Ibid., 120-121.

<sup>23</sup> Colonel G.T. Denison, *A History of Cavalry* (London: MacMillan and Co., 1913), 202; R.G. Grant, *Battle: A Visual Journey Through 5,000 Years of Combat* (London: DK, 2005), 132.

<sup>24</sup> Ibid., 202.

<sup>25</sup> Ibid., 199-200.

Another maneuver was called the caracole and it involved harassing enemy infantry with pistols while the cavalry attempted to reload on a moving horse.<sup>26</sup> Unlike Turkish tactics, which were designed to tire and weaken the enemy, Western tactics centered around delaying the enemy until the cavalry could mount a more effective charge. The idea of chivalry was still strong and glorious charges were still popular. Pistols were adopted to make the slaughter of a charge easier; if the enemy was already in disorder from the fear of the guns and broken up due to gaps in the line, friendly cavalry could mount a charge more easily.

If the Turks in Busbecq's story had adopted the pistol immediately, their tactics would have needed to change rapidly. Turkish cavalry tactics centered around the bow. Its greater rate of fire and range allowed the cavalry to stay well out of harm's way while they slowly tired and destroyed the enemy. Pistols were more suited to Western tactics. Their higher power and lower range and accuracy meant that they needed to be used in a volley to be truly effective. They were more cumbersome to reload on a moving horse, meaning that the rider would have to stop to reload the gun. Had the Turks adopted the gun, they would have had one shot from a very short range while they were luring their enemy into chasing them. While that one shot would certainly kill an enemy if it struck him, that one shot might not reach the enemy due to the gun's unreliability in firing and accuracy. Being at 100 yards rather than the previous 600 yards, the Turks would either struggle to reload while their fast horses galloped away causing them to spill more gunpowder than they used, or they would have to stop, while the enemy caught up, in order to reload their pistols. The Turks could carry multiple pistols, but in order to carry as many pistols as they could arrows, it would cost the Empire an atrocious amount of money. So, in order to adopt the more powerful guns as their main weapons, the Turkish cavalry would have needed to change their battlefield tactics entirely to western tactics. After having trained with the bow since they were seven, most, if not all, Turkish cavalymen would find this very difficult, and discipline would be lacking. So, for these 200 men, it seems that keeping their bows and arrows was the better choice for the moment.

This brings up the question of social acceptance of the gun. Gunpowder weapons were very dirty; the powder could spill, smoke billowed out of the gun every time it was fired, and the

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<sup>26</sup> O'Connell, 121.

gunner required so many different components in order to fire the gun that it could be difficult to keep them in order. According to Busbecq, this contributed greatly to the Sipahis' refusal to adopt the guns. Busbecq emphasized, multiple times, the pride that the Turks took in their cleanliness, and that the guns destroyed it. "Their hands [were] all begrimed with soot, their uniforms [were] dirty, and their clumsy powder-boxes and pouches [were] hanging down, so that they were a laughingstock to their comrades." Dirty and humiliated, the Sipahis could not accept a weapon that went against their sensibilities.<sup>27</sup>

The Sipahis also found the gun to be a cowardly weapon. Bows required great strength to fire and years of practice to aim properly. Guns, on the other hand, required only that a soldier place powder and ball into the gun and pull the trigger. They did not require nearly the same amount of effort on the part of a soldier in order to kill. The Sipahis saw this to be unfair and disgraceful because they had sacrificed years of their lives training for the capability to kill while someone with a gun needed to merely pull a trigger to be capable of the same. According to Busbecq, the Pashas commanding the Sipahis did not realize this. A messenger bearing the news of the Sipahis' defeat told them "did I not tell you that our men were overcome by the might of muskets? It was fire that routed us, not the valour of our foes." The Sipahis could not bring themselves to use such a shameful weapon.<sup>28</sup>

Another possible reason for refusing the firearm could come from class differences. The Janissaries who made up the vast majority of Ottoman gunpowder-using troops were slaves recruited from Christian families in captured territories who were indoctrinated into the service of the Sultan.<sup>29</sup> The Sipahis were landholders and volunteered year after year.<sup>30</sup> Due to firearms technology at the time, only infantry like the Janissaries could be equipped with handheld firearms when Mehmed first began using gunpowder weapons, so over the hundred years that followed between the siege of Constantinople and Busbecq's stays in the city, the firearm became exclusively a weapon of the slave class. For this reason, the Sipahis would have looked down upon the firearm as a weapon fit only for a slave and unworthy for a landholder. It would have been shameful and it would have made the Sipahis appear to be of a lower status if they

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<sup>27</sup> De Busbecq, 124.

<sup>28</sup> Ibid., 122-123.

<sup>29</sup> Goodwin, 32; McNeill, 34.

<sup>30</sup> Goodwin, 65; McNeill, 34

were to use firearms.

Guns could not be used effectively from horseback until the time of Busbecq, during the reign of Suleyman. For centuries, the Ottoman Empire had been expanding, and saw its greatest expansion during Suleyman's reign.<sup>31</sup> Much of this expansion had been westward, towards the Europeans, whose cavalry used guns; cavalry that had been defeated time after time by Ottoman bows. To the Sipahis, who had killed many of these gun wielding Westerners, the gun must have appeared weak, because, had the gun been a superior weapon, the Sipahis would have been dead and the Westerners victorious. So, psychologically, the composite bow and Ottoman tactics were better than guns and Western tactics to the Sipahis, regardless of the strengths and weaknesses each entailed. Conversely, when Ottoman expansion slowed after Suleyman's reign, Western warfare would have been more appealing to Ottoman soldiers who were now no longer the victors of every conflict. This could be a possible reason why the Sipahis did eventually switch to using firearms.<sup>32</sup>

When Ogier Ghiselin de Busbecq said in his letters "no nation has shown less reluctance to adopt the useful inventions of others," he was correct. The Ottoman Empire in Busbecq's time had adopted many great things from other cultures, most notably gunpowder weapons. It is very important to note, however, that Busbecq said "useful inventions." While gunpowder was *useful* to artillerymen and hand guns were *useful* to infantry like the Janissaries, guns were not *useful* to the Sipahis. While they could be less costly and time consuming to make and required less training to fire, guns lacked the rate of fire, range, and accuracy of bows. When on the battlefield, the only quality of guns that was better than that of bows was lethality. These aspects were fine for a Western style of warfare, but Ottoman tactics were incompatible with guns for these very reasons; without the ability to quickly move and send projectile after projectile into the enemy to weaken him, the Turks would have needed to change their tactics completely which would have derailed their expansion efforts.

At the same time, guns were incompatible with the social standing of the Sipahis. Guns were dirty and they humiliated the clean Sipahis. They were an unfair weapon that required much less skill and dedication to use effectively than a bow. They were the weapon of the

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<sup>31</sup> De Busbecq, xxii.

<sup>32</sup> Grant, *Battle*, 130.

enslaved Janissaries, a class below the landholding Sipahis. And they were the inferior weapon of the Westerners that the Turks had been defeating for over a century. Nevertheless, the Ottoman Empire, despite the refusal of the Sipahis to use firearms, remained a Gunpowder Empire. From the time of Mehmed II, the Turks had used gunpowder to expand their empire through artillery and infantry. They adopted the technology when it was still considered a novelty to other nations and remained at the forefront of its use until the seventeenth century. It was the Ottomans' ability to use this useful invention effectively, not an overzealous utilization of sheer power, which marked them as a Gunpowder Empire.