Surpassing Xerxes: The Advent of Ottoman Gunpowder Technology in the Fifteenth and Sixteenth Centuries

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Abstract

The purpose of this paper is to evaluate the advancement of Ottoman Turkish gunpowder technology in comparison to that of the West during the mid to late fifteenth and early sixteenth centuries, the early years and height of the Ottoman Empire. To achieve this, two seminal battles are examined, the Siege of Constantinople in 1453 and the Siege of Rhodes in 1522. By recounting military tactics and arsenals during these two conflicts, this paper shows that Ottoman gunpowder technology developed slowly at first, but was quickly adapted to the techniques they encountered as the empire expanded into Europe, eventually coming to rival European technology.

Introduction

Spring, 1453. Artillery surrounds the city of Constantinople, so precariously perched on the edge of Europe. An engineer surveys his work: a mighty bombard that can scarcely be moved by one hundred and fifty oxen. For the Ottoman besiegers, this is the means to reduce the city walls to rubble and remove the troublesome inhabitants of the city from their side once and for all. For the besieged Byzantines, this gun represents their doom, sapping their resolve before ever it makes a sound. Suddenly, a loud explosion fills the air. The bombard, along with its maker, the great engineer Orban, are no
Many modern historians believe this scenario to be factual, asserting that Orban was killed when his own gun exploded during the siege. The accuracy of this story is unsubstantiated, but the story still sheds light on a central issue in the history of the region. This anecdote serves to illustrate the magnificent inefficiency that characterized gunpowder technology in the early Ottoman Empire. At the Siege of Constantinople in April and May of 1453, the Ottomans presented an impressive spectacle, with their grand bombards and siege machines. But these guns, long since abandoned in Europe in favor of smaller and more efficient designs, only serve to highlight the lack of progress in gunpowder technology that seems to characterize not only the Ottomans, but the whole of the contemporary Islamic World. If it can be established that Ottoman technology lagged behind Europe at this time, then what was the trend going forward? By the sixteenth century, the Ottoman Empire, rising from the ashes of Byzantium, was the specter of Europe, and arguably more than a match for the European powers. How is it then, that the technology of this ‘gunpowder empire’ remained stagnant?

Was Ottoman gunpowder technology during the empire’s early years in the late fifteenth and early sixteenth centuries truly inferior to that of the European West? The Ottoman Turks were able to overcome European armies and holdouts throughout the Balkans and the eastern Mediterranean in the early years of their empire, culminating in iconic successes such as the fall of Constantinople in 1453 and the Siege of Rhodes in 1522. Keeping in mind obvious factors such as religious divides, leadership, and geography, this paper will examine the gunpowder technology of the Ottoman Turks at Constantinople in 1453 and Rhodes in 1522 to determine whether it really lagged behind that of Europe, or for how long, during its early years. In the end, the evidence suggests that while Ottoman gunpowder

254 Philippides and Hanak, The Siege and the Fall of Constantinople, 396.
technology was not initially the equal of that of Europe, it became more than a match over time as the Ottomans pushed farther into Europe, coming into contact with new technology.

**Historiographical Debate**

In truth, this is by no means a new question. In fact, a number of ideas on the subject are already widely disseminated, leaving little doubt as to the general scholarly consensus on the matter. The established, traditional view on Ottoman gunpowder technology is that it was simply imperfect. The underlying idea is that the Ottomans not only adopted gunpowder weapons comparatively late with regard to Europe, but also failed to set aside older and larger guns, such as those used at Constantinople, in favor of the smaller, more maneuverable European counterparts being developed.\(^{255}\) Those who argue for an Ottoman failure to reach Europe’s level of technological superiority in gunpowder technology explain it largely by logistics. Some, such as Geoffrey Parker, suggest that the Ottoman Empire failed to maintain the capacity for creating a surplus of artillery units, thus relying more on a smaller amount of large heavy artillery than a larger amount of smaller artillery, which would have been harder to maintain.\(^{256}\) This quality over quantity mindset would explain the tendency toward larger weapons. Many argue that this damaging tendency continued through to the seventeenth and eighteenth centuries.\(^{257}\)

There are many explanations for gunpowder’s failure to secure an early foothold. The initial reluctance of the Ottomans to embrace or advance gunpowder technology is often attributed to the fact that theirs was an Islamic empire. Some historians extend to the Ottomans an assumption of religious conservatism within Islamic empires that was hostile to new military innovations. Many Muslims felt that innovative European military technology existed in tension with Islam because


\(^{256}\) Ibid., 126.

\(^{257}\) Ibid., 126-8.
it did not exist at the time of Prophet Muhammad. \(^{258}\) Alternatively, the failure of very early firearms to compete with the archaic efficiency of bows and crossbows has been put forth as a factor in the late introduction of gunpowder. \(^{259}\) An analysis of military tactics common throughout the Islamic World reveals that in many cases, warfare was unsuited for the introduction and adoption of early firearms. Swift-moving, mobile cavalry strategies were generally held aloft as the standard for Muslim militaries. \(^{260}\) European armies were shifting away from feudal cavalry styles to Early Modern infantry tactics. Most interestingly, the lack of early development in gunpowder technology is also traced to insufficiently prescient leadership so common in Europe, characterized by men such as Henry V of England, Ferdinand of Aragon, Philip the Bold, and Louis XI of France, all of whom recognized the early potential of gunpowder technology and did much to further develop it. \(^{261}\)

Where Parker and many of those who argue against Ottoman gunpowder prowess emphasize the delayed advent of the technology and the failure to adapt to European technological norms, others insist that the traditionalists are wrong and that the Ottomans did, in fact, come to match the Europeans in gunpowder technology, at least for a time during the height of the Ottoman Empire. Gábor Ágoston champions this argument, rejecting assertions of Ottoman technological inferiority where artillery is concerned and combatting the assertion that the

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\(^{260}\) Stephen Christensen, "European-Ottoman Military Acculturation in the Late Middle Ages," in *War and Peace in the Middle Ages*, ed. B.P. McGuire (Copenhagen, Denmark: C. A. Reitzels Forlag, 1987), 234.

Ottomans tended toward large artillery pieces.\textsuperscript{262} In fact, he attributes the apparent inaccuracies of opposing arguments to three central problems: one, a failure to comprehend the complex terminology of Ottoman artillery, two, a failure to directly compare European and Ottoman guns, and three, the failure to take advantage of the Ottoman archives, which contain technical descriptions of individual pieces of artillery.\textsuperscript{263} The implications of Ágoston’s work suggest that the Ottomans did not, after all, merely favor large artillery such as bombards, but that they also incorporated numerous smaller guns in their arsenals. In fact, he argues that such large artillery comprised no more than ten percent of the Ottoman artillery train at any given siege, a figure applying even to early sieges in the fifteenth century.\textsuperscript{264}

The two points of view are not, in the end, mutually exclusive. Is it possible that while traditional scholars are partially right, that in the mid-fifteenth century Ottoman guns were no match for those of Europe, but that as time progressed, so too did Ottoman technology, thus shifting the argument toward the other side? The purpose of this paper is to document the trends in Ottoman gunpowder during the early years of the empire, utilizing the empire’s bookends of the Sieges of Constantinople and Rhodes to arrive at a conclusion. In truth, the evidence marshaled suggests that, with relevance only to this period of Ottoman history, Ágoston’s argument is substantiated. Specifically, it seems that while the Ottomans continued to utilize the outmoded bombard to great effect at Constantinople, by 1522 the power of the Ottoman arsenal had expanded dramatically, presenting more than a match for the European artillery wielded by the Knights Hospitaller. While many scholars who align themselves with the conservative narrative point to Ottoman failures later in the sixteenth and seventeenth centuries for support, it seems that during the golden age of the empire, the level of Ottoman gunpowder technology had risen to European standards.

\textsuperscript{262} Gábor Ágoston, Guns for the Sultan: Military Power and the Weapons Industry in the Ottoman Empire (Cambridge: Cambridge University Press, 2005), 61,93.

\textsuperscript{263} Ágoston, Guns for the Sultan, 62.

\textsuperscript{264} Ibid., 93.
The West and its Standards

Recognizable gunpowder weapons are believed to have become common in Europe in the 1320s and 30s. Western European entities such as France and Burgundy, long embroiled in conflicts on all sides, began to develop the most advanced military technology which was swiftly revolutionizing siege warfare. DeVries argues that the main distinction between European and Turkish guns was the new tendency in Europe toward smaller guns by the mid fifteenth century. Bombards were almost completely obsolete in Europe, with many being set aside or given as diplomatic gifts to less advanced kingdoms. While the Ottomans also developed smaller guns, the European versions facilitated more efficient reloading and aiming, rivaling the great bombards despite the difference in size. This capability might be traced to the introduction of corned powder around 1410, which could not be used by larger weapons. While the high standards in the development of European gunpowder are clear, the inability of the Turks to adapt to these standards remains in doubt.

The Turks and the Initial Adoption of Gunpowder Technology

The Ottomans were but a single entity within a wider group of peoples: the Turks. These peoples may have appeared on the borders of the Abbasid Caliphate in the ninth century, and Islam soon became the predominant religion held by these newcomers. The weakened state of the Caliphate, along with threats to orthodox Sunni Islam from the Shia Fatimid leaders of Egypt, allowed one group of Turks, the Seljuks, to rise to prominence in Iran and serve the Caliph in Baghdad as a new fighting force. In this capacity, the Turks first reached Anatolia and the

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265 Ágoston, Guns for the Sultan, 15-16.
269 Ibid., 9-10.
Byzantine Empire, raiding in the name of Islam. In 1071, the Byzantine Empire suffered one of the worst defeats in its history at the hands of the Seljuks at Manzikert, an event which subsequently allowed for Turkish incursion into former Byzantine lands.\textsuperscript{270} Settling on former Byzantine lands, the Seljuks in Anatolia called their empire \textit{Rum}, the Turkish variation of ‘Rome,’ a legacy that would be carried on by the Ottomans.\textsuperscript{271} With the coming of the Mongols in the thirteenth century, the Seljuks ceased to exist as a viable political force and, by the mid fourteenth century, were replaced by various smaller Turkish states in Anatolia, one of which would go on to form the Ottoman Empire.\textsuperscript{272} In a few short decades, the small principality founded by Osman expanded at the expense of both Byzantines and fellow Turks, eventually encompassing much of western Anatolia and former Byzantine lands in the Balkans. As they swiftly fought their way into Christian lands, the Ottomans were seen by the Europeans as the successors of older enemies from the East, succeeding where kings like Xerxes of Persia had failed in subjugating Europe.\textsuperscript{273}

The Ottomans were establishing their empire around the time that gunpowder was becoming a recognized and effective force in warfare. The Mongols are recognized as having contributed to the spread of extremely primitive gunpowder weapons throughout the Islamic world, but the use of such technology in a way reminiscent of later trends, such as recognizable cannons and firearms, would not become common in the Middle East and the Islamic world until the late fourteenth century, while in Europe they are believed to have become common in the 1320s and 30s.\textsuperscript{274} Early examples of the utilization of gunpowder weapons by the Ottomans in the 1380s roughly coincide with the rest of the Islamic world, but

\textsuperscript{271} McCarthy, \textit{The Ottoman Turks}, 21.
\textsuperscript{272} Ibid., 30-32.
\textsuperscript{273} Michael Ducas, \textit{The Siege of Constantinople 1453: Seven Contemporary Accounts} (Amsterdam: A. M. Hakkert, 1972), 86.
\textsuperscript{274} Ágoston, \textit{Guns for the Sultan}, 15-16.
the Ottomans adapted quickly. Ágoston suggests that the possibility exists that gunpowder technology spread to the Ottomans from the east, but states that it is more likely that it was acquired through warfare in the Balkans, which allowed the Ottomans to integrate European warfare techniques for the first time. This solidifies the assertion that the Ottomans were slow to adopt gunpowder initially but readily adapted to European trends, perhaps for reasons similar to those supplied by Cook and Christensen, namely that Middle Eastern military tactics were not easily adapted to gunpowder weapons. Taken together, these ideas suggest that the Ottomans only adopted gunpowder weapons and artillery as a significant military technology when they were confronted with the strategic need to do so. From this point, the Ottomans display an impressive ability not only to adapt their tactics to artillery style warfare, but also to adapt artillery style warfare to their tactics. One such instance is the adoption of the wagon fortress technique from the Hungarians in the early fifteenth century. This involved chaining the wheels of war wagons together to form a defensive wooden barrier and defending it with ranged weaponry that included handguns. This tactic was not entirely dissimilar from Central Asian traditions from which Ottoman warfare evolved. This tactic later spread to the Mughals and the Safavids, Islam’s other ‘gunpowder empires,’ providing insight into the ability of these empires to adapt to gunpowder technology while modifying it in turn.

The Ottomans failed to develop gunpowder technology independently of Europe and thus experienced a delay in the rise of gunpowder technology. It has been established that once this technology was forced upon the Ottomans out of the necessity of conflict, which forced them to adapt in order to combat the Europeans effectively in the Balkans, they were able to utilize it ingeniously and even apply it to their traditional tactics. The extent to which this ability applied is in question,

275 Ibid., 17.
276 Ibid., 17.
277 Cook, *The Hundred Years War*, 66; Christensen, “European-Ottoman Military Acculturation in the Late Middle Ages,” 234.
however, as is whether or not the Ottomans were capable of catching up to European standards of gunpowder technology.

**Constantinople: Gunpowder at the Rise and Fall of Empires**

To explore the extent of Ottoman military technology around the middle of the fifteenth century, this paper applies the lens of the siege and fall of Constantinople. This was a seminal point not only in the history of two empires, but also in that of Europe and the Middle East generally. It has also come to be known as one of the best examples of early artillery power.

One cannot truly understand the story of the Ottomans without first understanding the history of the Byzantines. Although the terms are used in this paper, the words ‘Byzantium’ and ‘Byzantine’ are in many ways anachronisms, because the entity they represent, in its own view, were not Byzantine, but Roman. Byzantium was the Eastern Roman Empire, and after the fall of the Western Roman Empire, traditionally dated to 476 CE, the Greek-speaking lands to the east remained in Roman hands. The empire’s lands radiated outward from the resplendent capital of Constantinople. Founded by Constantine I ‘the Great’ in 324 CE as a new Christian capital for the ever-changing Roman Empire, Constantinople’s position was one of the most advantageous of any city. It lay at a crossroads of world trade, an intersection between East and West, and its strategic location on the easternmost flank of Europe made the city both economically and militarily significant.\(^{279}\) The magnificence of the city dwindled after events in the thirteenth and fourteenth centuries, such as the Fourth Crusade’s infamous sacking of the city in 1204, but even in 1453 the city, a shadow of its former self more than one thousand years after its founding, was still looked to as the eastern bulwark of Christianity against Islam.\(^{280}\) By 1453, Constantinople had been surrounded by the Ottoman-held land for decades. The city was one of only a few remaining bastions of the ailing empire.

\(^{279}\) Crowley, *Constantinople*, 16.

\(^{280}\) Ibid., 27-28, 15-16.
Geography and Fortifications of the Queen of Cities

In the Spring of 1453, Sultan Mehmet II resolved to attempt the impossible: the capture of the city that had defied Islam for eight hundred years. Constantinople was thought to be impregnable. Positioned on a large promontory in Thrace, the city was surrounded on three sides by the sea. To the north, the Golden Horn separated the Latin city of Galata, or Pera, from the city proper. According to Leonard of Chios, a Greek Catholic bishop who served the Papacy in Byzantium and was an eyewitness to the siege, a great chain was used to block off the Golden Horn and its harbors from the Bosporus Strait, across which lay the vast expanse of Asia.\(^{281}\) To the south lay the Sea of Marmara. Sea walls surrounded the northern, southern, and eastern flanks of the city, but it was against the land walls that the Sultan would direct the power of his artillery. Throughout its history, only from the west did Constantinople face land-based sieges. Fortunately, this fact was compensated for by one of the greatest fortifications in the West, the Theodosian Walls. Originally constructed under Emperor Theodosius II (r. 408-450) around 413 CE, the walls complemented the pre-existing Constantinian Wall.\(^{282}\) An earthquake in 447 CE necessitated the renovation and improvement of the fortifications, and the finished product was legendary.\(^ {283}\) Philippides describes the walls as being between five and seven kilometers in length, although estimates vary. Ninety-six towers lined the length of the inner walls.\(^{284}\) The fortifications consisted of three defensive layers. The outermost layer was the fosse, a brick-lined moat twenty meters wide and seven meters deep, which had to be overcome in order for attackers to assail the walls behind it. Behind that lay the walls themselves: a smaller outer wall, nine meters high and one to two meters thick, and behind it, the last defense of the ‘City of the World’s Desire,’ stood the inner wall of Theodosius’s

282 Philippides, The Siege and the Fall of Constantinople in 1453, 297.
283 Ibid., 302.
fortifications. The inner wall averaged between fifteen and twenty meters tall and 4.5 to six meters wide. Together these two walls were lined with 192 towers and comprised part of a defense system consisting of five zones. These impressive fortifications, however, were designed for and suited to an age before the advent of gunpowder.

**The Leaders and Logistics of Conquest**

Leadership on both sides of the struggle surrounding the fall of Byzantium can be characterized as effective. The Ottomans were led by their Sultan, Mehmet II, a young man of insurmountable vigor with a cruel streak that made him an inexorable conqueror. Mehmet’s skilled leadership and military insight led him to recognize the value of gunpowder weapons and to learn how to apply them effectively in battle. The Byzantine Emperor, Constantine XI, was an older man, but one of fortitude and wisdom who recognized the precarious placement of his city. Neither man would back down from what they considered to be their destinies. To help to lead his forces, Constantine secured the aid of a Genoese soldier, Giovanni Giustiniani Longo, who would lead the Byzantine and Latin defenders and do his utmost to protect the Emperor’s city and render the Ottoman siege machines useless. The numbers present during the Siege of Constantinople are difficult to determine due to conflicting accounts. Giacomo Tedaldi, an Italian soldier and eyewitness, suggests a total number of about 200,000 combatants altogether at the siege. His estimate of more than forty thousand for the number of defenders, however, seems inflated. The Emperor’s friend and ally, George Sphrantzes, estimates that there were about eight thousand defenders, composed of Greeks and Latins both, which would place the Turkish numbers around 190,000. The ability of the defenses to withstand traditional medieval tactics would theoretically counteract any numerical advantage the Ottomans had if not for the

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285 Ibid., 308-309; Crowley, *Constantinople*, 17.
286 Philippides and Hanak, *The Siege and the Fall of Constantinople in 1453*, 308.
287 Crowley, *Constantinople*, 82.
intervention of gunpowder. As for the number of artillery weapons present at the siege, estimates vary. The Byzantines certainly possessed some strength in firepower, consisting mostly of medium-sized guns with a smaller number of large bombards. It is believed that economic and fiscal difficulties impeded Byzantine advancement and investment within the sphere of gunpowder technology. Eyewitness Leonard of Chios describes extensive utilization of guns among the defenders, but cites a shortage of powder and shot as crippling such efforts. Tedaldi describes several large cannons and a large number of smaller guns such as culverins. Leonard of Chios emphasizes the presence of two massive bombards, one of which burst early in the siege. The other, he describes as being used to lethal effect against the city. Modern scholarly assertions seem to support these claims. Saul S. Friedman places the number of large cannons, such as bombards at fourteen and the number of smaller weapons at about forty. The larger guns were truly gargantuan in size: Philippides estimates a length between twenty and 26.6 feet for the largest bombard, and a circumference of six to eight feet. The presence of so many smaller pieces of weaponry presents a challenge to the idea that European gunpowder had surpassed Ottoman technology by developing smaller guns still capable of mounting successful sieges. The capability of the smaller artillery is thus called into question. To discern whether these smaller guns were capable enough to play a large role during the battle, an understanding of the role of gunpowder in the siege is necessary.

The Siege of Constantinople

The Siege of Constantinople began on April 5, 1453, as the Ottoman armies of

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292 Leonard of Chios, The Siege of Constantinople, 16.
294 Philippides and Hanak, The Siege and the Fall of Constantinople in 1453, 418.
Sultan Mehmet II surrounded the land walls of the city. The Turkish fleet took up its position around the Constantinopolitan promontory, forcing the city’s Christian defenders to combat the enemy on both land and sea. Slowly, the Turkish guns were brought to the siege camps. The great guns of the renowned gunsmith Orban were positioned at various key placements along the wall. At Constantinople, it was these guns that were most brought to bear against their Byzantine enemies. One of the Orban’s guns was placed near the Caligaria Gate at Blachernae, a second at a joint between two walls, and another at the Gate of the Spring. The largest of the guns was trained on the Gate of St. Romanus. The bombardment that ensued sapped the strength and morale of the city. Crowley describes the failure of the bombards to work quickly, citing inefficient aiming and a slow rate of fire. This reveals the impact of the Ottomans’ lack of corned powder technology, which may have been the force behind moving Europe toward smaller, more efficient guns. According to the firsthand account of Giacomo Tedaldi, the guns typically launched about 120 shots a day, continuing unabated for days on end. Despite their weaknesses, the guns wrought havoc upon the Byzantine fortifications, so that crisis was only averted due to the efforts of Constantine and Giustiniani to repair the damage swiftly. In late April, the Bactatinian Tower collapsed as a result of the bombardment’s concentration on a single target, bringing down part of the wall with it. Delays and a lack of ingenuity on the part of the Ottoman command soldiery kept the breach from compromising the city, and sufficient repairs were made to the area to sustain it through the siege. Following an ingenious strategic maneuver in which Mehmet moved his ships overland, thus circumventing the great chain blocking access to the Golden Horn, conflict erupted on the water. In order to alleviate the threat of enemy ships, the Ottomans developed cannons that closely resembled the

295 Crowley, Constantinople, 112.
296 Ibid., 118.
297 Tedaldi, The Siege of Constantinople, 3.
299 Crowley, Constantinople, 143-44.
later mortar. The siege continued in cycles of bombardment, attack, and repair, interrupted by eventful periods such as the naval maneuvers. Finally, on May 27, the most intense bombardment yet was leveled against the Byzantines, enlarging the damages to the wall in the hopes of creating an opportunity for an assault. The process of repairing the walls became more difficult. Two days later, on May 29, 1453, the Ottomans breached the city of Constantinople. The assault came quickly, hammering the ragged defenses. In the fray, Giovanni Giustinianhi, who, together with the Emperor was the guiding light of the defense, was wounded and withdrew to seek medical attention. Panic broke out amongst the soldiers, who fled or were massacred by the oncoming Turks. Emperor Constantine XI, 88th Emperor of the Byzantine Empire, fell in the chaos of the city’s sack. The Byzantine Empire had fallen. In its place arose the Ottoman Empire. Turkish and Muslim Istanbul replaced the Greek and Christian Constantinople. The symbolic and political ramifications of the siege are many, as are the implications for the level of development in Ottoman gunpowder.

**Analysis**

Constantinople provides a scintillating glimpse into the development of Ottoman warfare and stands out as the pinnacle of Ottoman technology as of the mid-fifteenth century. Many historians believe the heavy bombards constructed by Western experts such as Orban played an invaluable role in the course of the conflict, allowing the Turks not only to inflict immense damage upon the impressive but antiquated fortifications and eventually breach the city, but also to sap the morale of the defenders and keep the city under constant bombardment, ideas that are supported by available firsthand accounts. Despite the presence of smaller guns at the siege, they appear to have been incapable of impacting the battle, which suggests that they were not capable of equaling the force of a bombard in the way

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300 Ibid., 158.
301 Ibid., 88.
that smaller, more advanced forms of guns in Europe were able to. Another point to make is that European specialists such as Orban crafted many of the great gunpowder weapons used at Constantinople. Indeed, foreign experts represented a major source for the influx of technology into Ottoman military spheres, a process Ágoston calls military acculturation.\footnote{Ágoston, \textit{Guns for the Sultan}, 42-43.}  At this early stage, military acculturation reveals a way that the Ottomans acquired gunpowder technology, but suggests that it was not yet as advanced as that of Europe. With the capture of Constantinople, however, the Ottoman Empire was invigorated and with its glory years ahead, there was still time to match Western technology.

**Rhodes: Gunpowder at the Fall of the Holy Order**

Over the next six decades the Ottoman Empire swiftly took shape, consolidating control over its eastern lands and eventually, by the sixteenth century, coming to threaten the powers of Europe. By the end of the reign of Suleiman the Magnificent, who ruled from 1520 to 1566, the empire stretched from Egypt and the Hedjaz in the south to Hungary in the north.\footnote{McCarthy, \textit{The Ottoman Turks}, 95-99.} The Ottomans under the House of Osmanli had established the region’s only great Islamic empire. As ever, the Christian West looked on with suspicion as the Turkish threat grew, using whatever means lay at their disposal to curb the power of the Turks. One particularly troublesome thorn in the side of Istanbul was a small island that lay dangerously close to the Ottoman heartlands. The island of Rhodes was the last outpost of the Knights of the Order of the Hospital of St. John, the Hospitaller Knights. Founded by the Blessed Gerard before 1113 CE, the Hospitallers formed a monastic military order that was and is a legacy of the Crusades. Answerable to the Pope in Rome, by 1522 the Knights had weathered four hundred years of turbulent holy war. The loss of Acre in 1291 forced the order to seek a new headquarters, and
they chose the small but strategically positioned Greek island of Rhodes in 1307.\textsuperscript{305} By 1522, the island and its dependencies composed one of the last sovereign Christian entities in the Eastern Mediterranean.\textsuperscript{306}

**Geography and Defenses of Rhodes**

The location of Rhodes reveals much about its significance to the Ottomans. Positioned off of the southern coast of Asia Minor, the island lay in the middle of the Eastern Mediterranean, making it an ideal location from which to launch raids on Ottoman sea lanes and providing a stepping stone into the Ottoman heartlands for any army. The Knights had fortified the island well over the course of their two hundred year presence, however. By 1522, Rhodes had a thoroughly advanced defense system. The ramparts of Rhodes were interspersed with bastions and towers, with ditches and ravelins before them to cover any weak spots in the bastions' angles.\textsuperscript{307} After the Siege of 1480, Grandmaster d'Aubusson initiated a series of renovations to the defenses in preparation for another Turkish attack. The ultimate aim was to keep the Turks away from walls while also making the walls more resistant to artillery bombardment. To achieve this, the moat was widened and *tenailles*, additional defensive-works that lay before the main fortifications and were made of packed earth, were constructed, providing increased protection from gunpowder weapons.\textsuperscript{308} Despite its smaller-scale defenses and significance, when compared to Constantinople Rhodes provided a much more advanced set of fortifications against which Ottoman firepower would be set.

**Leaders and Logistics in 1522**

Much like the situation at Constantinople, the leadership at Rhodes was highly effective on both sides. Indeed, Suleiman the Magnificent, who is widely

\textsuperscript{307} Brockman, *The Two Sieges of Rhodes*, 52.
\textsuperscript{308} Smith and DeVries, *Rhodes Besieged*, 75.
regarded as the one of the greatest of the Sultans, led the Ottomans. At Rhodes Suleiman was a young man, much like Mehmet at Constantinople decades before. During his strong leadership, the Ottoman Empire experienced what is often regarded as a golden age. The Hospitaller Grandmaster in 1522 was Philippe Villiers de L’Isle Adam, a man of great tenacity, courage, and faith who understood how best to use Rhodes’s defenses as well as Suleiman knew how to assault them. Estimates for the Turkish numbers during the siege vary wildly. Eyewitness Jacques de Bourbon claims that the initial fleet consisted of about two hundred ships. After the initial arrival of the fleet several dozen other ships arrived, bringing the estimated number to about 250 vessels. Some historians argue that the origin of the ships is more significant. Suleiman combined his Turkish and Syrian fleets, which left other parts of his empire disproportionately unprotected, reflecting the importance affixed to this campaign. Eyewitnesses generally place the number of Ottomans on the field at about 165,000 to 200,000, but many modern historians believe this to reflect the massive numbers of enemies rather than a specific number. L’Isle Adam’s figures for his own men reveal that he had a mere 16,000, many of which were likely untrained in soldiery.

Bourbon describes seventy-four pieces of larger artillery along with a great number of smaller guns, sakers, and passevolans, both of which were smaller guns commonly used in Europe, along with an untold amount of handguns. The larger guns consisted of cannon perriers, bombards of various sizes, basilisks, double cannons, and mortars, along with the less clearly defined ‘pieces of iron and bronze.’ Robert Douglas Smith and Kelly DeVries suggest that the larger and smaller pieces of artillery were mixed at the batteries. This wide arrange of artillery types already presents a change from the bombard-centric artillery of Constantinople. The artillery power of the Knights, not inconsiderable, was made up partially of weapons from Europe and partially of guns cast by the knights themselves,

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310 Ibid., 95-99.
providing an excellent case study of Ottoman and European guns in use against each other. Some guns had origins in France or the Holy Roman Empire, while the Hospitallers cast others following European technological norms. Smith and DeVries argue that the guns used by the Knights within the city were very similar to those being used against them. Like the Ottomans, the Hospitallers had at their disposal cannon perriers, basilisk guns, and many smaller artillery pieces. Some of these guns were cast as early as the 1470s and 80s, but many were also made later, with origins in the first two decades of the sixteenth century. The efficiency of the Ottoman war machine with this technology may be observed in the siege.

**The Siege of Rhodes**

The Siege of Rhodes began on June 26, 1522. After the arrival of the fleet, the Ottomans dug a series of trenches around the city to enable their gunners to be protected while being as close as possible to the city walls. From here and from higher ground, the Turks began an artillery barrage on the city. The Hospitallers returned fire on the batteries to devastating effect, but not enough to permanently cripple them due to Ottoman repairs during the night. Eventually, significant breaches were made in the walls at the bastions of Spain, England, Provence, and Italy, a testament to Ottoman artillery skill when one considers the extent of the fortifications. Military engineers within the city swiftly repaired these, however. The Ottomans then turned to mines to supplement their artillery power. On September 4, sappers greatly damaged the wall around the bastion of England. For the first time the Turks assaulted the wall, although they were held back by the Knights. On September 24, the largest attack yet was made possible due to the damage wrought by artillery fire and mines. The Turks penetrated into the city, but were again pushed back by the valor of the defenders and the fire of Hospitaller guns. Ottoman assaults on the walls continued to fail through November. By the

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312 Ibid., 133-166.
313 Ibid., 104.
end of the month, both sides were stretched thin. The breaches in the defenses were becoming large, especially at key junctures such as the Tower of Spain. The Knights were reduced to defending the breaches with their last strength. In December, Suleiman agreed to terms proposed by the Hospitaller Grandmaster, and the last of the Knights of St. John withdrew from the eastern Mediterranean.$^{314}$

**Analysis**

Unlike the course of events at Constantinople seventy years earlier, at the Siege of Rhodes the Ottoman Empire was able to bring to bear the full glory of their arsenal, the legacy of seven decades of empire-building and technological diffusion. At Rhodes, a variety of gunpowder weapons, both large and small, were used to great effect, breaching walls that, unlike the fortifications of Theodosius, were designed to withstand fire from enemy artillery. What is more, the guns used by the Turks here are believed to be of the same sort used by the Hospitaller Knights within the city, which themselves were examples of contemporary European gunsmithing.$^{315}$ The fact that there are similar guns of Turkish origin suggests that the Turks were not so far behind European technology as previously thought, if at all.

**Conclusion**

Ottoman gunpowder technology is often considered to have lagged behind that of Europe, in that it failed to progress to the smaller variety of guns that became prominent in the West. This gap did exist. The Ottomans developed gunpowder technology only after coming into contact with European styles of warfare that made it a necessity. By 1453, great bombards were produced that could inspire fear in the Sultan’s enemies and breach what were once the greatest fortifications in the world. Even these lagged behind Europe’s own developments, which featured smaller guns and corned powder. By 1522, however, at the height of

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$^{315}$ Ibid., 104.
the empire, Suleiman the Magnificent was able to field a vast assortment of artillery weapons, ranging in size and age and more than matching the enemies’ European firepower. The Turkish preference for larger guns such as bombards remained, but this was clearly not at the expense of smaller guns more similar to those of Europe. It seems that at least for a time during the golden age of the Turks, Ottoman gunpowder technology was a match for that of Europe. The idea that a non-Western culture was capable of adopting Western technology so quickly and effectively is an uncommon one that may be mirrored in other places and other times, a question that bears further examination. The Ottoman Empire was a centerpiece of the historical narrative of the East versus the West, but the truth is not that simple. Cultures are fluid and often inclusive, incorporating what avails them, be it ideas or technologies. As the Ottoman adoption of gunpowder reveals, the ideas of East and West are ideological concepts, but need not be ideological barriers.