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"Locking up the Strait in the fifteenth century's Ottoman Mediterranean": The Bosporus' sea forts of Mehmet II (1452)

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Abstract

In the fifteenth century, the Mediterranean world was in turmoil. A new sultan, Mehmet II, had just inherited a vast empire stretching over two continents in the centre of which the ruins of the Byzantine Empire survived through the city of Constantinople. In order to seal his accession, he therefore undertook important preparations to conquer the "City guarded by God". Mehmet then ordered the construction, within 4 months, of an imposing fortress nicknamed *Boğazkesen* (the throat cutter). This *coup de force* is a testimony to the incredible military and economic power of this growing empire that masters a new war technology: artillery. The Ottomans, who were still novices in this field, had therefore had to adapt their fortifications to the use of firearms. Using local and foreign architects and engineers, the Ottoman fortifications built in the fifteenth and sixteenth centuries bear witness to an architectural experimentation that seems to testify, like the work carried out in Rhodes by Pierre d'Aubusson or in Methoni by the Venetians, to a real research in terms of offensive and defensive effectiveness. In this context, the fortifications of *Rumeli Hisarı* and *Anadolu Hisarı*, built on either side of the narrowest point of the Bosporus in 1451-1452, are characterized by the presence of large coastal batteries that operate together. They were to block access to Constantinople by the Black Sea, combining sinking and dismasting fire.

Keywords: Bosporus, fifteenth century defensive architecture, fortifications of the early artillery era, Ottoman fortifications.

1. Introduction

The spread of firearms modify the architectural conventions. From a structural point of view, the fortifications must guard against this new weapon, which during the following centuries, becomes more and more effective. Architects must also open shooting ranges and find sites to house heavy muzzle-loading weapons. Thus from the advent of Mehmet II, a new offensive architectural style was created with the construction in 1452 of *Rumeli Hisarı* and *Anadolu Hisarı*, two forts at sea established on either side of the narrowest point of the Bosporus. For the first time, fortifications totally integrate artillery in their structure, to fight against the on-board artillery of the war ships and this, 50 years before the French answers in Toulon (1515) or Le Havre (1517), 60 years before the construction of the *Megalos Kules* (1524) in Heraklyon by the Venetians, and 75 years before the forts at the sea of Henry VIII of England.

2. The Bosporus Strait

The Bosporus Strait connects the Black Sea to the Aegean Sea. It is part of the Turkish Strait System (TSS) which also includes the Marmara Sea and the Dardanelles Strait further south.

This inlet, which looks like a river with a winding course between two fairly high banks, is about 30 km long. It runs north/south from Istanbul to *Beykoz*, then follows a first bend to the northwest for about 4 km at *Sariyer*, before returning to its original orientation to the Black Sea (Fig. 1).

The southern mouth of the channel, almost 3500 m wide, receives to the west, a vast estuary 7 km long, called the Golden Horn, before gradually narrowing to 860 m, between *Rumeli Hisarı* and *Anadolu Hisarı*. The canal widens again to 1500 m and opens into a funnel towards the Black Sea.

To understand the hydrological characteristics of the Strait, we must consider it as a whole. The configuration of the two sea basins (Black Sea/Marmara Sea) connected by the strait has a strong asymmetry. Many rivers supply the Black Sea directly or indirectly. The latter then discharges its overflow towards the Mediterranean, by a very powerful surface current, generally from the Black Sea to the Marmara Sea. This force varies according to the width of the strait and the irregular shape of the coastline so that too much advance projects the flow towards the opposite shore at a very steep angle. The intensity of the current is also affected by fluctuations in winds blowing in the same trajectory as the channel, most often from north to south. Topographical and climatic constraints continuously impose powerful currents which, unlike the Dardanelles in calm weather, remain extremely fast. These physical characteristics dictate difficult conditions for navigation. Boats had to negotiate the routes according to the sudden changes in current orientation along the inlet, while the frequent fogs provided additional discomfort.

Due to its configuration, the Bosporus Strait was a major crossing point; first as an important maritime communication route between the Black Sea and the Aegean Sea, but also as an intercontinental transit route between Asia and Europe.

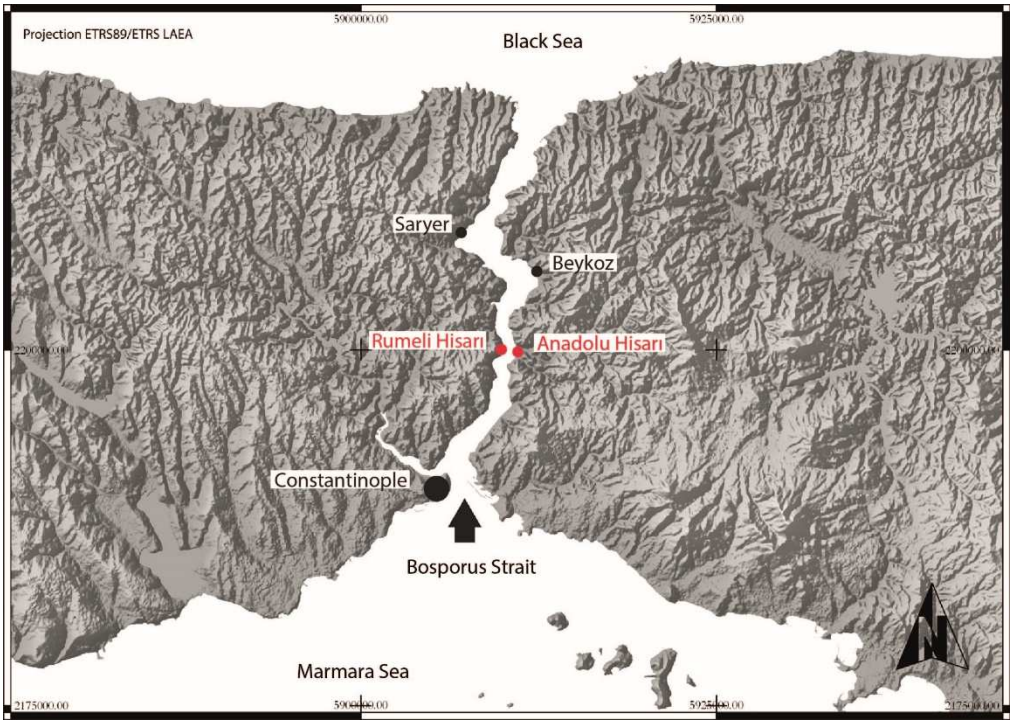

Fig. 1. Bosporus Strait (Vincent Ory, 2019).

The Ottomans settled permanently on the eastern coast of the Bosporus during the fourteenth century. In 1394, Bayezid I *Yıldırım*, undertook the siege of Constantinople. More or less before the outbreak of hostilities, he ordered the construction of the *Gözluce Hisarı* fortress at the mouth of the Göksü River on the eastern bank of the Bosporus, 10 km north of Istanbul. The latter was to secure the intercontinental transit route that would allow its troops to cross the strait and maintain communication with Ottoman forces operating on the European coast. Bayezid, like his successors, did not have a sufficiently efficient fleet to ensure and perpetuate the crossing of the strait.

Mehmet II enlarged *Gözluce Hisarı* in 1452, and in the same year, on the European side of the Bosphorus, launched the construction of the imposing Rumeli Hisarı fortress opposite the first one. They had to prevent any supply of the city by Christian ships in the Black Sea, and to do so had been considerably provided with artillery.

However, the system does not seem to have had, at least initially, the expected effectiveness. On November 10th, 1452, the garrison of *Rumeli Hisarı* opened fire on two Venetian galleys from the Pontic region, which managed to pass. Undoubtedly, the novelty of this system explained this first failure, and perhaps it was necessary to make some adjustments before Antonio Erizzio's ship was sunk on November 26th of the same year.

The two forts at sea finally had an economic interest. By blocking the strait, the Sultan had also taken control of the only seaway leading to the Black Sea and its riches. All types of ships, whether commercial, military or private, and of any nationality, foreign or even Turkish, had to pay a tax that was an important source of income for the empire.

When in 1484, the Black Sea became an "Ottoman Sea", the fortresses lost their military importance and were converted into prisons.

3. *Rumeli Hisarı* and *Anadolu Hisarı* : a dam on the Bosporus

While there does not seem to be any document preserved in the Ottoman archives that would allow us to date the construction of *Rumeli Hisarı* and the expansion of *Anadolu Hisarı* with any precision, the many testimonies and chronicles from the time Constantinople was taken provide valuable information (Déroche, Vatin, 2016). Thus it was possible to determine that the erection of the first one began in mid-spring 1452 and was completed in August of the same year.

Rumeli Hisarı was designed by Mehmet II, assisted by the architect Müslihiddin and a monk converted to Islam.

The context of this fortification campaign was clearly explained by Kritoboulos. The fortresses would, in fact, be advantageous for various reasons and would serve as a powerful support point for the siege of Constantinople that Mehmet was about to undertake. Their foundation thus appears as the prologue to the fall of the Byzantine Empire. Therefore, they had first to isolate the city of Black Sea by the Bosporus by sinking any ship that tried to force the strait.

But if the primary purpose of these forts at sea had been to stifle Constantinople, cut off from the pontic supply, it is nevertheless certain that they were also intended to ensure communication between Europe and Asia, so that the West could not prevent Ottoman troops from crossing it, as had been the case several times before.

The fortress of *Rumeli Hisarı*[1], in Europe, occupies the steep slope of the foothills of two hills overlooking the Bosporus, between which a small valley slopes gently to the sea. The irregularity of the relief imposed an irregular polygonal plane running from north to south over a length of about 250 m and a maximum width of 130 m. The complex is dominated by three autonomous master towers, occupying the peaks of the two hills and the centre of the valley at its contact with the sea. A fourth, smaller "master" tower controls the southeast corner. They interrupted the entire enclosure, and

flanked by thirteen towers of various plans. Access to the fortress was through three doors in the curtains, respectively to the west, north and northeast, as well as through two potterns, systematically flanked by a tower. Independently of the *corps de place*, a coastal battery or *hisar peçe*, wrongly named barbican by Albert Gabriel because of its wall pierced by a door placed in front of the *northeast* access, doubled the eastern enclosure along the shore. This one, now partially destroyed, had many shooting gates built at the level of the sea so that the shooting trajectories were perpendicular to the coastline.

The fortress of *Anadolu Hisarı*[2], in Asia, is characterized by a large square tower doubled to the south by a roughly quadrangular enclosure flanked by four towers. Built in the 1390s, it occupies the top of a reef overlooking the mouth of the Göksü River. In 1452, Mehmet II added a polygonal enclosure flanked by three circular towers to the alluvial plain that had formed around the original site. Only the northeast quarter, with two doors, does not appear to have been washed by the water, while the western curtains had many shooting gates. The latter, arranged slightly above sea level, covered the strait at an angle of about 115°. The fortress' largest dimensions were 70 m, from *north to south*, and 80 m from east to west.

4. Armament and action principle of forts

It is difficult to know exactly the composition and layout of the armaments, particularly artillery, when the fortresses are completed. The chronicles, despite their large number, because of this event considered by his contemporaries as exceptionally remarkable, are rarely so detailed.

Kritoboulos, one of the most singular eyewitnesses for his work dedicated to Mehmet II, reported that the site and programme had been chosen so that the structure had the widest possible width along the coast to place guns covering the sea. Then, he explained that at its completion *Rumeli Hisarı* was equipped with all kinds of weapons, and defensive equipment. It was mainly equipped with "stone and catapult throwing machines" of all sizes –the largest, facing the sea, were massed on the ground along the entire length of the wall along the shoreline– suggesting that the order included both powder and mechanical artillery.

Doukas claimed that bronze cannons threw stones of more than 600 pounds (about 294 kg) and had been installed in the *Halil Paşa kulesi*, while Nicolò Barbaro wrote that the fortress was firmly defended on the sea side by a very large number of bombards established on the coast and the ramparts.

Tursun Bey, finally, was the only one to speak clearly of an advanced work on the water, pierced by twenty firing gates, in which very high-calibre pieces had been placed. He added that this device had also been built on the side of the "new fort located on the opposite bank" –*Anadolu Hisarı*– without however providing more details.

On the other hand, Evliyâ Çelebi (1611-1682) gives figures and the type of artillery. Thus in *Rumeli Hisarı* it counted 105 pieces among which there were *balyemez* and *şayka* on the waterfront. But we do not know in what proportion they arm the coastline. Nor does it provide any indication of Anadolu Hisarı's ordonance.

In addition to this limited written information, there is a document of exceptional significance because it is probably the first representation of the Bosphorus fortifications. Preserved at the Biblioteca Trivulziana in Milan, in the codex 64, Babinger believes that it was made by a Venetian spy around 1453 (Babinger, 1955, p. 190). There is clearly large artillery facing the sea perpendicular to the coastline. Unfortunately, the annotations do not provide any further details.

he information provided by the written sources is therefore limited as regards the composition of the ordinance, but supplemented with the architectural study, it makes it possible to glimpse the fire plans (Fig. 2).

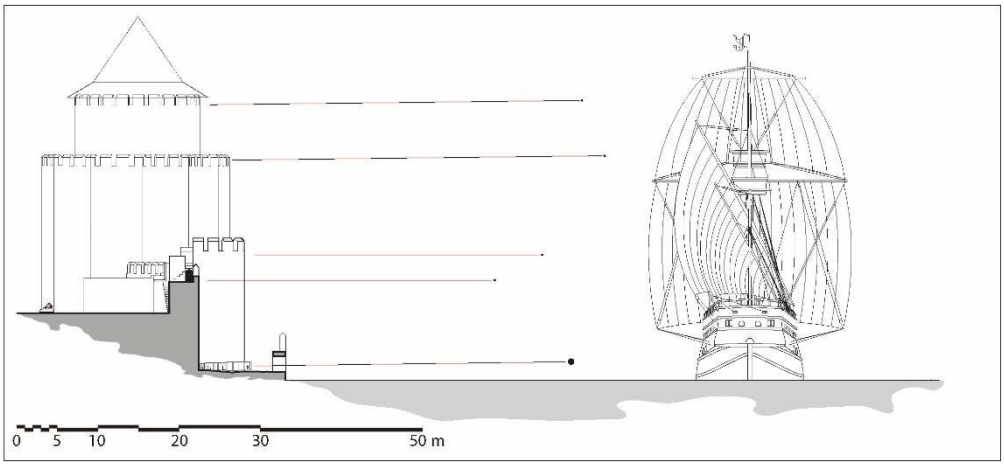

Fig. 2. Theoretical distribution of fire levels on the *Rumeli Hisarı* seafront (Vincent Ory, 2019).

It is therefore possible to suggest that the maritime front, which constitutes the offensive element of these fortresses, was the most heavily armed. A first shot of fire, at sea level, was armed with bronze cannons –probably of the *balyemez* and *şayka* type– firing 600 pound (about 294 kg) cannonballs on the southern portion and of a smaller calibre in the north. If the offensive character, at *Anadolu Hisarı*, seemed to be limited to this low battery, that of *Rumeli Hisarı* was doubled by a second shot of fire, apparently ensured by box bombards arranged at nearly 13 m above sea level. The latter was itself supported by an intermediate position established at an altitude of about 15 and 17 m on the top terraces of the towers in the middle of the curtain wall. According to Kritoboulos, mechanical or kinetic artillery was also used to crown the enclosures and towers. A third level of fire was allowed by the terrace crowning the *Kuçuk Zağanos Paşa kulesi* and probably by light artillery on the main terrace of *Halil Paşa Kulesi* which culminate respectively at 22,70 m and 26 m. A fourth plan was guaranteed by box bombards installed on the north curtain wall at mid-slope, which stood at 31,50 m, and by light artillery on the summit terrace of the *Halil Paşa Kulesi*. Finally, close defence was also provided by light artillery placed on the towers and probably by mechanical and powder handguns.

If the location of *Anadolu Hisarı* had probably been dictated by two geographical parameters that would meet its supposed roles of securing the intercontinental transhipment point and protecting the mouth of the Göksü River, the choice made for the construction of *Rumeli Hisarı* would appear to be defined by other requirements. Also, as Kritoboulos and Tursun Bey testify, particular attention has been paid to the characteristics of the currents. Mehmet II would have visited the canal with specialists to determine the areas that would present the greatest difficulties for navigation.

The navigation conditions between *Rumeli Hisarı* and *Anadolu Hisarı* are complicated due to a relatively strong current. Regardless of the wind direction, the flow invariably evolves from the Black Sea to the Marmara Sea. In most cases, it remains in the centre of the channel, but the arrangement of the points and curves on both sides of the channel is such that, in some places, the water is sometimes pushed towards the opposite coast with violence. Thus, when encountering the Asian coast at Kalinca, the current's trajectory gradually moves towards the European coast and passes near *Kayalar Burnu* where *Rumeli Hisarı* is located at a speed of 5 to 6 knots.

In this context, ships heading down to Constantinople were exposed to extremely dangerous currents, so that "ships were thrown and

broken against the reefs if sailors did not provide care and experience". Ships sailing towards the Black Sea also had to deal with headwinds

Thus, in the fifteenth century, naves and galleys encountered difficulties in navigating the strait. Although the latter could row their way in, their shallow freeboard and shallow draught made them unstable in bad weather and adverse conditions. The 1,20 m high waves were an almost insurmountable obstacle that could capsize them. In addition, since the cruising speed of propulsion by oars was about three knots during the day, halved at night, the galleys had great difficulty maintaining a velocity that would allow them to cross the passage. The rigged ships had to follow particular trajectories to benefit from the counter-currents and sail up the strait.

The point chosen for the establishment of *Rumeli Hisarı* was therefore partly determined by the unfavourable navigation conditions there and by the distribution of surface currents whose main flow ran along the European coast. The addition of maritime batteries to the narrowest part of the channel therefore only increased the risk of shipwrecks, both for naves and galleys. The chronicles mentioned above, as well as the architectural analysis of the fortresses, suggest, in theory, the composition of the coastal batteries. Thus, *Rumeli Hisarı* was probably equipped with 16 giant bombards and 4 smaller ones, while *Anadolu Hisarı* had 9, probably of the same categories. Two of these unusual pieces, which were part of *Rumeli Hisarı*'s arsenal, are on display in front of the site, while a third is in the War Museum at İstanbul. They provide a glimpse of the type of weapon used. Weighing nearly fifteen tons, they fired 630 mm diameter stone balls weighing about 285 kg. Their maximum range, in comparison with the Dardanelles' guns, was supposed to be close to 1200 m, while their effective range was certainly lower. However, even with a 50% reduction in the latter, European and Asian fire crossed in the middle of the channel since the strait is not

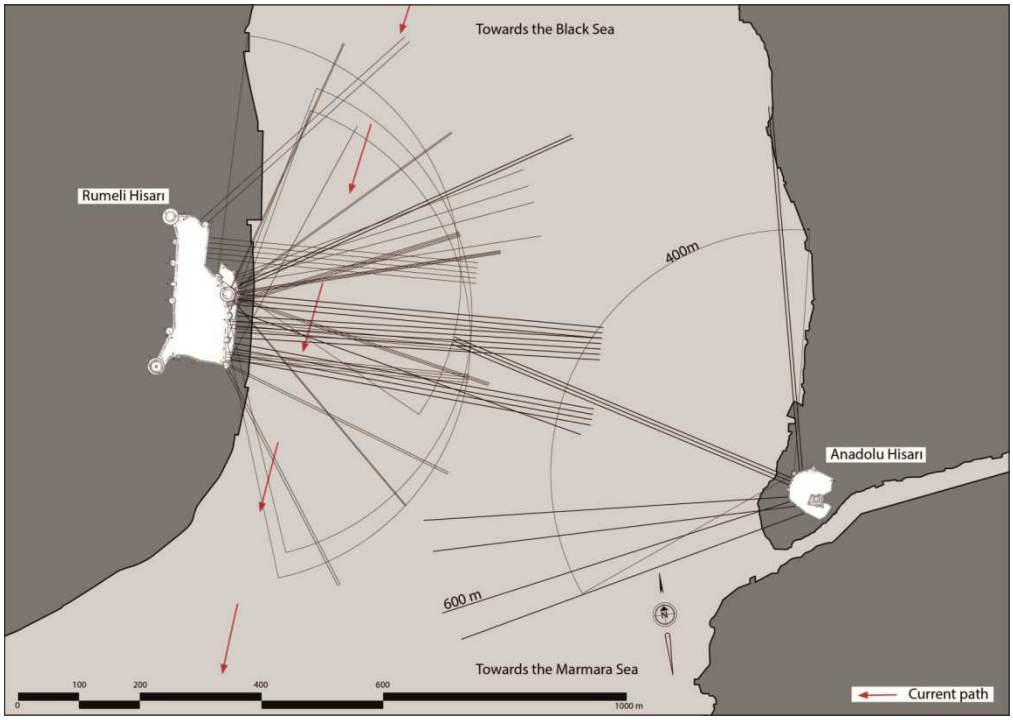

Fig. 3. Theoretical fire plans of the fortresses of Rumeli Hisarı and Andolu Hisarı (Vincent Ory, 2019).

more than 830 m wide at this point. The absence of a trunnion and the presence of attachment rings suggest that these bombards were placed on fixed mounts, so the angle of fire was not adjustable. In addition, the size and weight of the projectile resulted in an extremely slow firing rate, so that after the first firing, however destructive it may have been, these weapons could not be recharged quickly. Consequently, the garrison had to prepare them and wait for the target to pass in front of the gun to make a salvo. The importance of the calibre and the enormous crushing power of the stone balls thrown by the main battery bombards indicate that its role was clearly the firing to sink.

The provision to *Rumeli Hisarı* of three additional fire plans on the waterfront curtains and on the terraces of the *Halil Paşa Kulesi* was certainly intended to destroy the rigging of naves, galleys and other sailing ships. They should therefore promote the use of scrap metal. The ordinances installed on the enclosure probably favoured direct fire, perpendicular to the axis of the walls, while the towers allowed the radiant fire to cover a larger area. There is no element to determine the characteristics of the gun supports and therefore their manoeuvrability, except on the north enclosure at mid-slope where the provisions suggest the use of fixed supports placed directly on the ground.

Powder artillery appears to have been supported by mechanical artillery, referred to as catapults, also positioned on towers and curtains. The maritime fronts of *Rumeli Hisarı* and *Anadolu Hisarı* were thus equipped with devices that allowed parabolic or vertical firing.

The layout of the two fortresses and the configuration of the coastal batteries suggest that the two fortifications acted in a complementary manner to control the strait by crossing their fires. They combined the use of giant stone-throwing bombards for sinking fire with lighter pieces on three superposed levels for dismasting fire (Fig. 3).

5. Conclusion

In conclusion, it can be said that these forts at sea are characteristic of this period of architectural renewal linked to the massive use of artillery, where the increase in the effective range of weapons now makes it possible to block and control previously uncontrollable traffic routes from the coast. With *Anadolu Hisarı* and *Rumeli Hisarı* built in 1451, Mehmet Fatih introduced the concept of “double sea forts”, which he would perfect 10 years later on the Dardanelles. These forts were designed from the beginning by two to operate in a coupled manner and increase the risk of sinking for the enemy by combining the sinking fire, and dismasting fire in areas where the sailing conditions were already dangerous and complicated.

It is therefore necessary to specify that the fortress of *Rumeli Hisarı*, whose plan may seem illogical because of its location straddling a valley, must be approached as an element of protection for the coastal battery. It is the latter that must be established on the narrowest portion of the strait. The monumental complex that dominates it is totally devoted to its defence.

In addition, the Ottomans appear to have been pioneers in this field by using principles that other nations seem to have used half a century later. Thus the arrangement of batteries established on either side of a waterway was taken over by King Manuel I of Portugal to control access to Lisbon by sea with the construction of the Belem tower on the bank of the Tagus between 1514 and 1519. The principle was taken up ten years later by the architects of Francis I of France when he built the Château d’If in front of Marseille in 1529.

The forts at *Rumeli Hisarı* and *Anadolu Hisarı* seem to illustrate that under the reigns of Mehmet the Conqueror and Süleymân the Magnificent, the Ottomans actively participated in the evolution of military architecture to adapt it to the use of artillery, as did European powers such as the kingdoms of France, Spain or the city-states of Italy.

Notes

[1] For a description of Rumeli Hisarı see: Gabriel, 1943, pp. 29-75; Ayverdi, 1989, pp. 626-660).

[2] For a description of Anadolu Hisarı see: Gabriel, 1943, pp. 9-28; Ayverdi, 1966, pp. 501-506; 1989, pp. 617-624.

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