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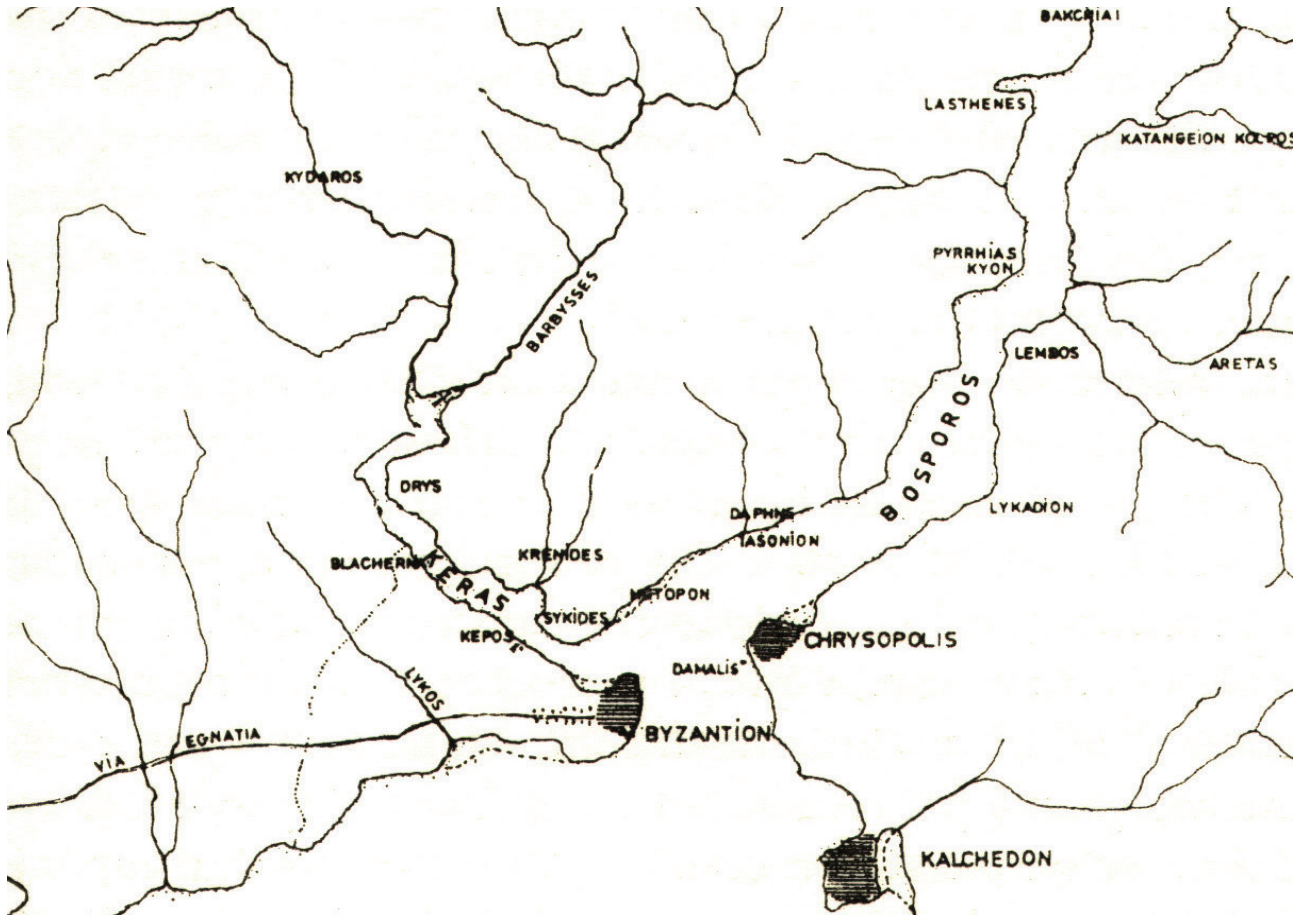
BYZANTIVM NUNC CONSTANTINOPOLIS.

Ex aere & Constantino Imperatore



01 PORTRAIT OF AN IMPERIAL CAPITAL





Istanbul is the only city in the world that stands astride two continents. It spreads across the southern end of the Bosphorus, the historic strait that connects the Black Sea, the Greek Pontus Euxinus, and the Sea of Marmara, known in antiquity as the Propontis, and thus separates Europe from Asia. The city is further divided on its European side by the Golden Horn, the Greek Chrysokeras, a scimitar-shaped inlet fed at its upper end by two streams known as the Sweet Waters of Europe, the Greek Cydaros and Barbyzes. The historian Procopius, writing in the mid-sixth century A.D., described the city as “surrounded by a garland of waters,”<sup>1</sup> an encomium that could still be applied to modern Istanbul despite the ravages of time.

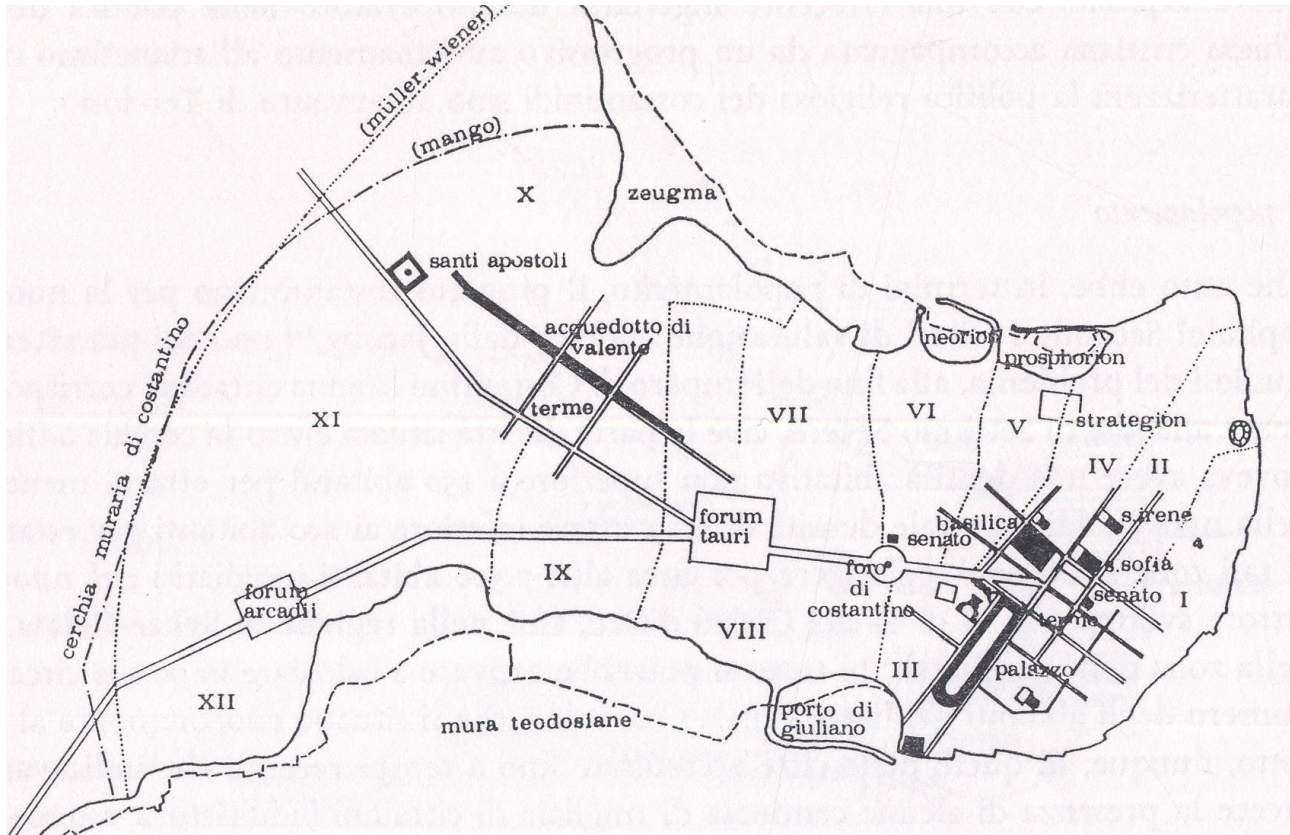
## ANCIENT BYZANTION

Humans have lived in the area now known as İstanbul since at least the Neolithic. The earliest known settlement dates from 6700 BC, discovered in 2008, during the construction works of the Yenikapı subway station and the Marmaray tunnel at the historic peninsula on the European side. The first human settlement on the Anatolian side, the Fikirtepe mound, is from the Copper Age period, with artifacts dating from 5500 to 3500 BC. In nearby Kadıköy (Chalcedon) a port settlement dating back to the Phoenicians has been discovered. Cape Moda in Chalcedon was the first location which the Greek settlers from Megara chose to colonize in 685 BC, prior to colonizing Byzantion on the European side of the Bosphorus under the command of King Byzas in 667 BC. Byzantion was established on the site of an ancient port settlement named Lygos, founded by Thracian tribes between the 13th and 11th centuries BC, along with the neighbouring Semistra, of which Plinius had mentioned in his historical accounts. Only a few walls and substructures belonging to Lygos have survived to date, near the Seraglio Point (Turkish: Sarayburnu), where the famous Topkapı Palace now stands. During the period of Byzantion, the Acropolis used to stand where the Topkapı Palace stands today. After siding with Pescennius Niger against the victorious Septimius Severus the city was besieged by Rome and suffered extensive damage in AD 196. Byzantium was rebuilt by the Roman Emperor Septimius Severus and quickly regained its previous prosperity, being temporarily renamed as Augusta Antonina by the emperor, in honor of his son.

## BYZANTIUM

Byzantine Constantinople was built on a roughly triangular peninsula that forms the southeastern most extension of Europe. The Byzantine city was bounded on the north by the Golden Horn, on the south by the Marmara, and on the west by the land walls built in A.D. 447 by Theodosius II in the final expansion of late Roman Constantinople, which was later enclosed by defense walls on its seaward sides as well.

The periphery of the defense circuit was more than 20 kilometers, measuring 5.3 kilometers along the sea walls of the Golden Horn, 7 kilometers along the Theodosian Walls, and 20 kilometers along the Marmara sea walls. The area enclosed by the Byzantine walls includes seven hills, six of them rising from the ridge that parallels the Golden Horn and the other forming two peaks in the southwestern sector of the city above the Marmara. The French antiquarian Pierre Gilles (Petrus Gyllius), writing in the mid-sixteenth century, used these seven hills as landmarks in his pioneering study of the topography of the Byzantine city. He identified the First Hill as the eminence at the tip of the Constantinopolitan peninsula, numbered the next five hills in succession along the Golden Horn ridge, and referred to the twin-peaked hill to the southwest above the Marmara as the Seventh Hill.



The original periphery of the peninsula was originally smaller. Its current size is due to the filling in of the bays and Byzantine harbors on both the Golden Horn and the Marmara as well as the shallows outside the sea walls. As Cyril Mango has shown, there were originally two shallow but deeply indented bays, one on the Golden Horn between Third and Fourth Hills, and the other due south on the Marmara, about a kilometer inside the Theodosian walls. An isthmus about a kilometer wide separated the inner ends of the two bays were eventually filled in, probably beginning with the founding of Constantinople by Constantine the Great in A.D. 330.

A stream known as Lykos, now canalized beneath the streets of İstanbul, entered the city from the west and flowed in the valley that separates the Seventh Hill from the Fifth and Sixth Hills, finally emptying into the bay that indented the Marmara shore before it was

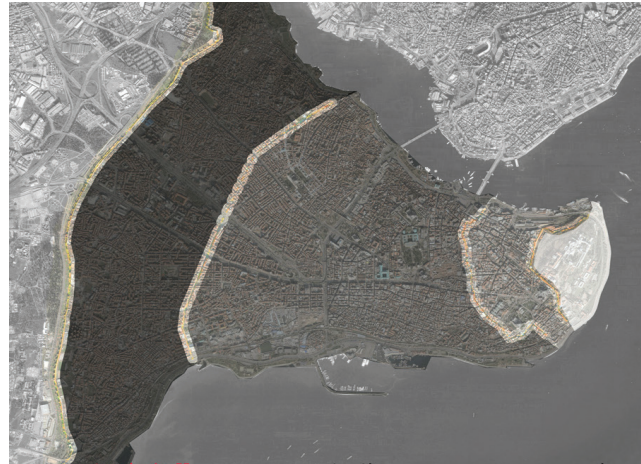
filled in beginning in the late Roman era.

The city was originally known to the Greeks as Byzantion, whose Latin form, Byzantium, is now more widely used. Byzantium was named for its legendary founder, Byzas the Megarian, who is supposed to have established a Greek colony here c. 660 B.C. The Megarians had seventeen years earlier established a colony at Chalcedon, today's Kadıköy, on the Asian shore of the Marmara just beyond the mouth of the Bosphorus.

According to tradition, before Byzas set out on his expedition, he consulted the Delphic oracle, who advised him to settle "opposite the land of the blind." The meaning of this, according to Herodotus, quoting the Persian general Megabazas, was that "the men of Chalcedon must have been blind at the time, for if they had any eyes, they would not have chosen an inferior site when a much finer one [that of Byzantium] lay ready to hand."

The original site of Byzantium was on the First Hill, where the waters of the Bosphorus and the Golden Horn merge and flow into the Marmara. Byzantium was laid out with its acropolis, or upper city, on the steep-sided summit of the First Hill and with its lower town extending along the shores of the Marmara and the Golden Horn. One of the advantages offered by this site, compared with that of Chalcedon, was its greater defensibility, for the steep hill at the confluence of the Bosphorus and the Golden Horn was protected by the sea on all sides except to the west, where a defense wall could be erected. Another advantage was that the Golden Horn provided a superb natural harbor, shielded from storms by the heights that enclosed it on all sides except where it opens into the Bosphorus, and there the cape known in antiquity as the Promontorium Bosphorium curves around to protect the inner port. This promontory also acts as a barrier to divert the shoals of mackerel that swim down the Bosphorus from the Black Sea, forcing them into the port and creating an abundant fishery that became one of the principal sources of income for the people of Byzantium. Other important sources of income were the tolls and harbor fees paid by the ships that passed through the strait, for Byzantium controlled the Bosphorus from the beginning of its history, and this was the principal reason for its subsequent rise to greatness. Gilles, after describing the topography of the ancient city, wrote that "the Bosphorus is the first creator of Byzantium, greater and more important than Byzas."

After siding with Pescennius Niger against the victorious Septimius Severus, the city was besieged by Roman forces and suffered extensive damage in 196 AD. Byzantium was rebuilt by Septimius Severus, now emperor, and quickly regained its previous prosperity. It was bound to Perinthos during the period of Septimius Severus. The location of Byzantium attracted Roman Emperor Constantine I who, in 330 AD, refounded it as an imperial residence inspired by Rome itself. (See Nova Roma.) After his death the city was called Constantinople (Konstantinoupolis) ("city of Constantine"). It remained the capital of the Eastern Roman Empire, which is called the Byzantine Empire by modern historians.



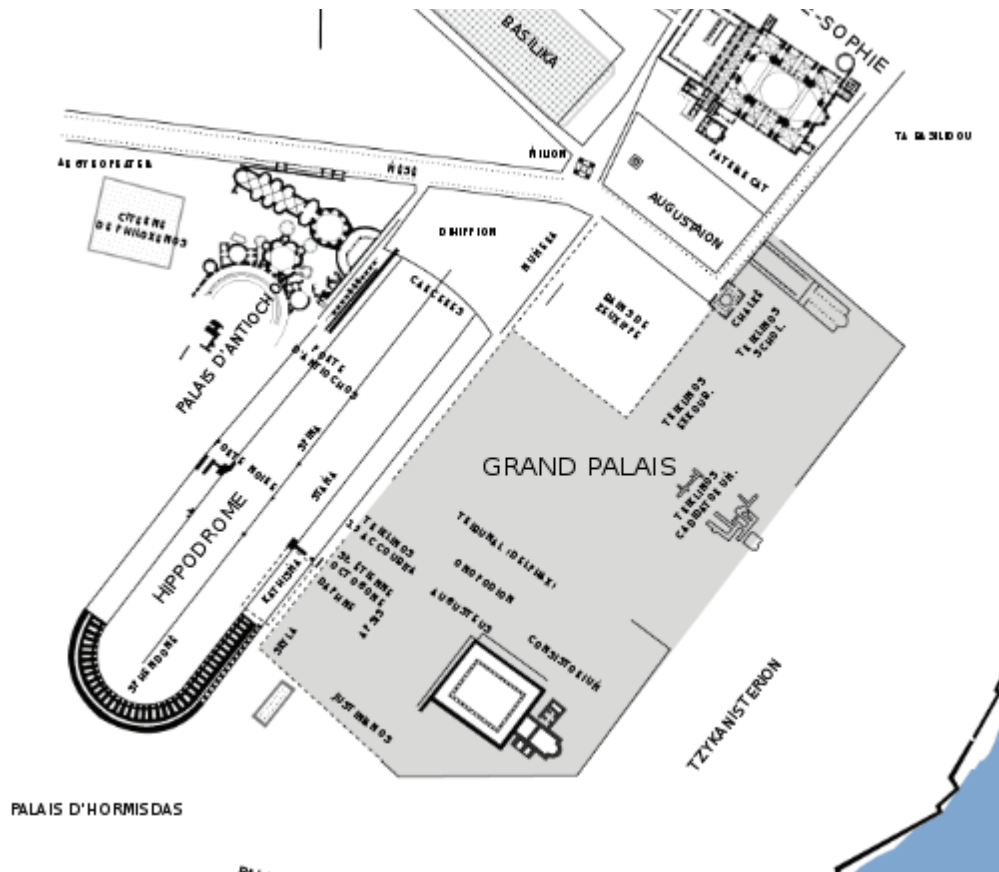
## The City Walls

The acropolis of Byzantium was undoubtedly fortified, as this was typical of ancient Greek cities. According to Hülya Tezcan, Byzantium's fortifications are represented by the later walls, partly Byzantine and partly Turkish, built against the steep sides of the plateau on which Topkapı Sarayı, the former imperial palace of the Ottoman sultans, stands at the eastern extremity of the First Hill. There was also an outer wall that extended along the shores of the Marmara and the Golden Horn below the First Hill, its landward side probably following much the same course as the fortifications that Sultan Mehmet II built in 1465 to enclose Topkapı Sarayı. It appears that a new circuit of walls enclosing a larger area was erected before Byzantium was destroyed by Septimius Severus. According to Dionysius Byzantius, the walls had a circumference of 35 stadia (c. 6.5 kilometers), they included



the First Hill and part of the second, and they enclosed three ports on the Golden Horn. These fortifications may have been the walls that were destroyed in 196. Cyril Mango has suggested that Septimius did not erect a new circuit of walls when he rebuilt the city but that the Byzantines themselves restored the walls he had destroyed, probably in the mid-third century, when the Goths were threatening Byzantium. In any event, in the mid-third century the outer walls of the city probably began on the Golden Horn just below the present Galata Bridge and enclosed the two contiguous harbors known as the Neorion and the Bosphorion, the first of these being on the west and the second on the east. The walls ascended from the Golden Horn to the summit of the Second Hill, then descended to the Sea of Marmara, curving around the southern end of the Hippodrome, an arena for chariot races that had been erected by Septimius when he rebuilt Byzantium.

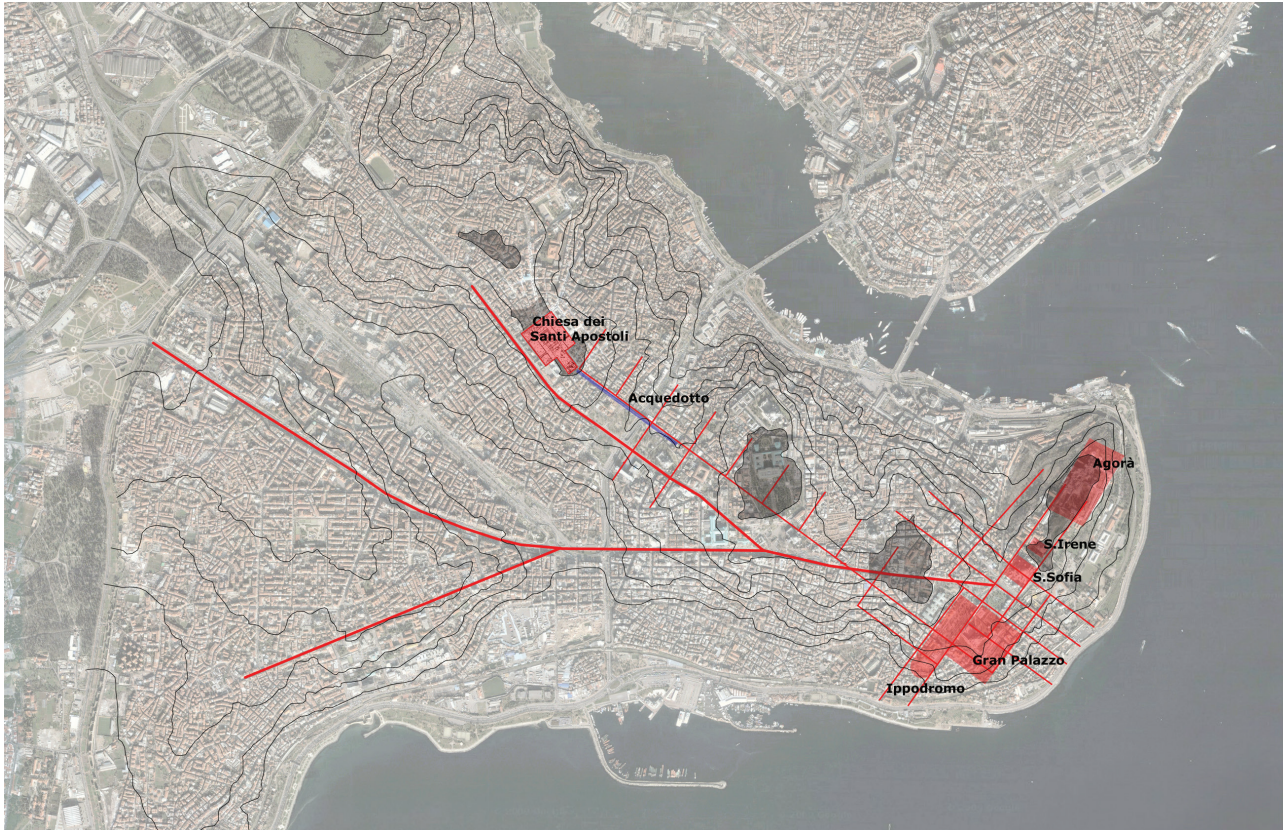




## The Hippodrome

The hippodrome is the only monument remaining from the time of Septimius Severus, though it was probably rebuilt and perhaps enlarged by Constantine the Great a century and quarter later.

The site of the Hippodrome is on the southern side of the first hill, preserved in a park known as the Atmeydanı, the field of horses, whose peripheral street follows the course of the ancient racetrack. The two long sides of the Hippodrome are now partially bounded by the Palace of İbrahim Paşa, on the west, and the Mosque of Ahmet I. on the east.



## CONSTANTINOPLE

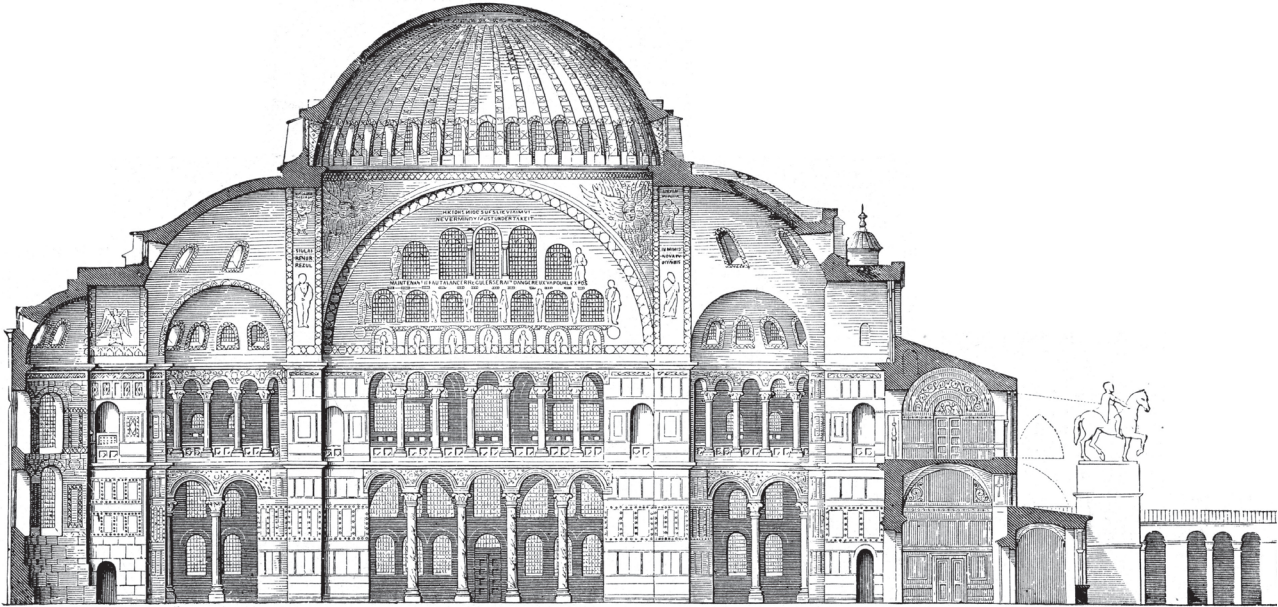
Constantinople was founded by the Roman Emperor Constantine I (272–337 AD) on the site of an already-existing city, Byzantium, which was settled in the early days of Greek colonial expansion, probably around 671–662 BC. The site lay astride the land route from Europe to Asia and the seaway from the Black Sea to the Mediterranean, and had in the Golden Horn an excellent and spacious harbour.

The most famous Byzantine emperor was Justinian (527-565). During his reign he extended the Byzantine Empire to its largest boundaries spreading from Palestine to the tip of Spain. His other achievements include the famous Hagia Sophia church and the organized law system called the Codex which was completed in 534. However, Justinian's reign was the greatest influence of the Byzantine Empire.

Starting in the 600's warfare kept Constantinople's power flip-flopping between decline and progression. Alliance with Europe slowly began to break away from the Byzantine Empire between the seventh-eighth centuries when the Byzantine and Roman churches disagreed on various subjects. However, the distinguishing gap placed between the two churches involved the use of icons in the church. Icons, being images of Christian holy people such as Jesus Christ, the Virgin Mary and the saints, to Byzantine Christians were more than representations they were believed to possess holy power that affected people's daily lives while many Byzantines worshiped icons many opposed the icons because they tested the authorities of the emperor. Finally in 726, Emperor Leo III (ruled, 717-741) ordered all icons to be destroyed. The destruction of icons reorganized and reoriented the Byzantine rulers in imperial power. The fierce opposition to icons clashed with the pope's tolerance of images. The papacy was unwilling to permit sacred images and icons to be destroyed and this caused eventual separation. Their separation caused hatred between the two churches and cooperation between the two was a struggle.

From around 800s to 1200 Constantinople developed complex relationships with an emerging and later the largest and most advanced state of that time in Europe - Kiev Rus. Constantinople played a significant role in the Kiev Rus development, culture, and politics. Many of the Kiev Princes were married to daughters of the Byzantine Emperors, and because of this connection Eastern Europe became Orthodox, after it was Christianized by Vladimir the Great of Kiev. However these relationships were not always friendly - Constantinople was sacked several times over those 400 years by Kiev Princes, forcing Constantinople to sign an increasingly favorable treaties for Kiev the texts of which were preserved in the Primary Chronicle and other historical documents (see Rus'-Byzantine Wars). Byzantine constantly played Kiev, Poland, Bulgaria, and other European Nations of that time, against each other.

Near 1204 Constantinople began to decline in power. Because of the failure of the Third Crusade, self-confident western Europeans decided to again try to capture the Holy City of Jerusalem in the Fourth Crusade; but this time their plan was to capture the Byzantine Empire as well. In 1204, western armies captured Constantinople and ransacked the city for treasures. The pope decried the sacking of Constantinople but ordered the crusaders to consolidate their gains in the city for a year. The crusaders chose Baldwin of Flanders to be the new Byzantine Emperor; he along with other princes and the Venetians divided the Empire amongst themselves; they never made it to Jerusalem. This new Latin Empire at Constantinople lasted until 1261, when the Byzantines under the command of Michael VIII Palaeologus recaptured the city and some outlying territory. After this, Constantinople never regained its former glory. Rather than a thriving metropolis, Constantinople transformed into a collection of villages.



## Hagia Sophia

At first it was the church of Hagia Irene which served as the cathedral of Constantinople. In 350 Constantinus, son of Constantine built a new church called Hagia Sophia. This early Hagia Sophia had a single basilican form in the example of the first Christian Church in Rome, the great Lateral church, built by Constantine in the honor of his Christian mother.

The important events about the cathedral of Constantinople were all centered around the struggle for power between the patriarch or the bishop of Constantinople and the Emperor. Ideally the cathedral was the place where the Emperor and the Patriarch met in peace. It was a place where both became equal under the protection of God; however, politically this was not always so and usually, the building of Hagia Sophia suffered by the strife between the Emperor and the Patriarch because the cathedral was also a place for public gatherings, and for the people voicing their complaints. Usually the bishops were against the power and the riches of the Emperor. In 398 John Chryostom became bishop and started to oppose the emperor. When he was exiled by the emperor there was a big

riot and the populace burnt down the cathedral. Hagia Sophia was rebuilt in 415 and then burnt down again. Finally in 532 Emperor Justinian decided to build a more impressive cathedral. The architects Anthemius and Isidore are referred to, by the contemporary historian Procopius as *mechanicoi* and not as architects. Anthemius must have been a teacher of geometry. They were more like master builders or engineers. Yet, it is thought that without their new theoretical approach it would not have been possible to build such a new and unique design.

The dedication of Hagia Sophia occurred on the 27th of December in 537. While the Patriarch Menas rode in the imperial chariot, the Emperor Justinian walked with the people in the procession. Hagia Sophia was where the Byzantine emperors were crowned. This was also because they wanted to have a good relation with the church. When the Emperor entered the church, he would leave his crown and sword at the narthex before entering the main hall. When the Ottoman Sultan Mehmet II took Constantinople in 1453, the first thing that he did was to pray in the Hagia Sophia. He had the church cleaned and decorated and paid his respects to it. Hagia Sophia became the imperial mosque of Mehmet II for 10 years till he had his own mosque built. We believe this was designed by the Venetian architect Filarete. Mehmet II did not touch any of the figurative mosaics. Some time later, they were covered in plaster, as a protection against any harm that might come from fundamentalist religious people. All through the Ottoman rule Hagia Sophia was greatly venerated and after the foundation of the Republic of Turkey in 1923 it was turned into a museum.

### **Theodosian Walls**

The Theodosian walls were built about 14 miles west of Constantine's original fortifications. The area occupied by the city was therefore greatly increased, and, most suitably for the city that had inherited the mantle of Rome, the completed Theodosian walls of Constantinople enclosed seven hills.

From the moment that Anthemius' designs began to take shape the erection, maintenance and repair of the new fortifications of the city became an undertaking in which all citizens were required to assist in one form or another. On that point the laws were very strict, and neither rank nor privilege exempted anyone from their obligation to carry out the work. One-third of the annual land tax of the city went towards the cost of the walls, and any additional expenditure was provided by requisitions laid upon the inhabitants. There does not seem to have been much grumbling about the matter. Indeed, there was a genuine enthusiasm for a project that promised increased security, and the government harnessed such enthusiasm in various ways. One subtle ploy was the way the government appealed to the citizens' generosity according to which circus faction they belonged to. These factions, among them the Blues and the Greens, were the supporters of chariot-



racine racing teams. They were great rivals when cheering on their side from the terraces of the Hippodrome, but worked together on the walls when the city was threatened. Records show that in AD 447, when repairs were being undertaken, the Blues and Greens supplied 16,000 men between them for the building effort.

The walls designed by Anthemius were completed in the year AD 423, the fifth year of the reign of Theodosius II, who was then about 12 years old. They survive today as the inner wall of the fortification line that extends from the Sea of Marmara to the ruins of the Byzantine Palace of the Porphyrogenitus (Tekfır Sumy). The increase in the area they enclosed also necessitated an extension of the sea walls along the northern and southern shores of the city, although these works were not carried out until some time later.

The first challenge faced by the original line of the Theodosian walls was provided by nature. In AD 447, only 34 years after their construction, the greater part of the new walls,

including 57 towers, was flattened by a series of mighty earthquakes. The timing could not have been worse as Attila the Hun was advancing on Constantinople. Fortunately, in a splendid confirmation of the energy and commitment to their defence that the citizens of Constantinople had shown before, the government and people rose to the challenge and restored the fallen walls in less than three months. These new walls helped to save Constantinople from Attila, although other sources tell of an epidemic among his followers.

Strangely enough, we do not know for certain the name of the man who took the lead in this great endeavour. He may have been called Constantine or Cyrus, and he was the then Praetorian Prefect of the East. Our anonymous hero went much further than mere restoration, and took the opportunity to make the city into a much stronger fortress than even Anthemius had dared to contemplate. An extra wall was built outside Anthemius' wall, with a broad and deep moat in front of it. When the work was complete the city lay behind three lines of defence and 192 towers flanked the walls. It was these walls that were to prove impregnable for the next 1,000 years and survive to this day.

### **the Mese: Main Street of Constantinople**

#### *the center of the city*

Imagine the main street of your own town, the center of your home city. There are shops and restaurants, markets and amusement centers, bustling activity and the crowds of people. Just like modern urban centers, Byzantine Constantinople had a main street, known as the mese. In fact, the word mese means literally “middle road,” indicating the centrality of this street (Kazhdan). Cutting through virtually the entire city, the mese was the main avenue of traffic running through or alongside almost every major monument and gathering space of civic importance. And just like the main streets of today, the mese was more than just a road – it was also the center of economic and social activity, surrounded by porticoes, or colonnaded shopping centers. An examination of this monument provides both a greater understanding of daily life in Byzantium, as well as a more unified, comprehensive picture of the city of Constantinople.

#### *urban geography and history*

Approximately 25 meters wide, the mese began at the Milion Stone, located in the Augusteion Square outside of the present day Hagia Sophia, and extended west past the edges of the Hippodrome, the Palaces of Lausus and Antiochus, through the Forum of Constantine and the Forum of Theodosius. Shortly after passing through the Constantinian Capitolium the road bifurcated, with one branch running northwest and ending at the Gate of Polyandri at the Theodosian Walls, and the other (more important) route heading southwest, passing

through the Forums of Bovis and Arcadius before ending at the ceremonial Golden Gate, where it joined the Via Egnatia, the main road of the Roman Empire (Kuban 35.) Some early form of the mese probably existed in the pre-Constantinople Roman settlement established by Septimus Severus as an extension of the Via Egnatia. The Via Egnatia was the main road of the Eastern Roman Empire, which wound through Greece and then eventually connected to the then small settlement of Byzantium. However, the mese of Constantinople can be dated to the founding of the city itself in 330 A.D (Kuban 72).

In addition to its centrality, running virtually along the “spine” of the city through almost every major monument and public space, the importance of the mese can also be seen in relation to other lesser road networks of the city. Relying on excavations completed in the 1930s by von Gerkan and Olof Dalman, Albrecht Bergstein Berger was also able to establish the comparative centrality and importance of the mese by studying the road layout of Constantinople (Berger 162). The three other “major roads” identified by Berger, “appear to radiate from a single point” forming a more or less rectangular pattern of urban pathways (Berger 165). In contrast, the “only major street that does not fit...is the main street,” which cut through the street pattern at a rectangular angle (Berger 165). Thus, similar to the large modern thoroughfares of Pennsylvania Avenue in Washington D.C. or 5th Avenue in New York City, the mese distinguished itself from lesser streets both in its size and through a conscientious disruption of the normal traffic pattern.

## OTTOMAN EMPIRE'S İSTANBUL

On 29 May 1453, Sultan Mehmed II “the Conqueror”, entered Constantinople after a 53 day siege during which his cannon had torn a huge hole in the Walls of Theodosius II. İstanbul became the third capital of the Ottoman Empire.

Mehmed’s main concern with Constantinople had to do with rebuilding the city’s defenses and re-population. Building projects were commenced immediately after the conquest, which included the repair of the walls, construction of the citadel, and building a new palace. Mehmed issued orders across his empire that Muslims, Christians, and Jews should resettle the city; he demanded that five thousand households needed to be deported to Constantinople by September.

By 1459 the Sultan promoted a lot of energy to bringing prosperity to Constantinople. In several quarters of the city pious foundations were created; these areas consisted of a theological college, a school (or a Madrasa, usually connected to the mosque), a public kitchen, and a mosque. In the same year Mehmed sent out orders that any Greeks who had left Constantinople as slaves or refugees should be allowed to return. These actions led it to become a once again thriving capital city, now of the Ottoman Empire. Upon taking control of the city, Sultan Mehmed sought to rejuvenate İstanbul. He created





the Grand Bazaar (one of the largest covered marketplaces in the world), brought back fleeing Catholic and Greek Orthodox residents. In addition to these residents, he brought in Muslim, Christian, and Jewish families to establish a mixed populace. Sultan Mehmed also began the building of architectural monuments, schools, hospitals, public baths, and grand imperial mosques.

From 1520 to 1566, Süleyman the Magnificent controlled the Ottoman Empire and there were many artistic and architectural achievements that made it a major cultural, political, and commercial center. By the mid-1500s, the city's population also grew to almost 1 million inhabitants. The Ottoman Empire ruled Istanbul until it was defeated and occupied by the allies in World War I.

## **THE REPUBLICAN REVOLUTION AND THE RELOCATION OF THE CAPITAL**

The foundation of the Republic of Turkey on the 29 October 1923 marks the culmination of a political revolution which brought six hundred years of Ottoman sovereignty to an end. The proclamation of Ankara as the capital of the new Nation-State dates to 13 October, i.e.



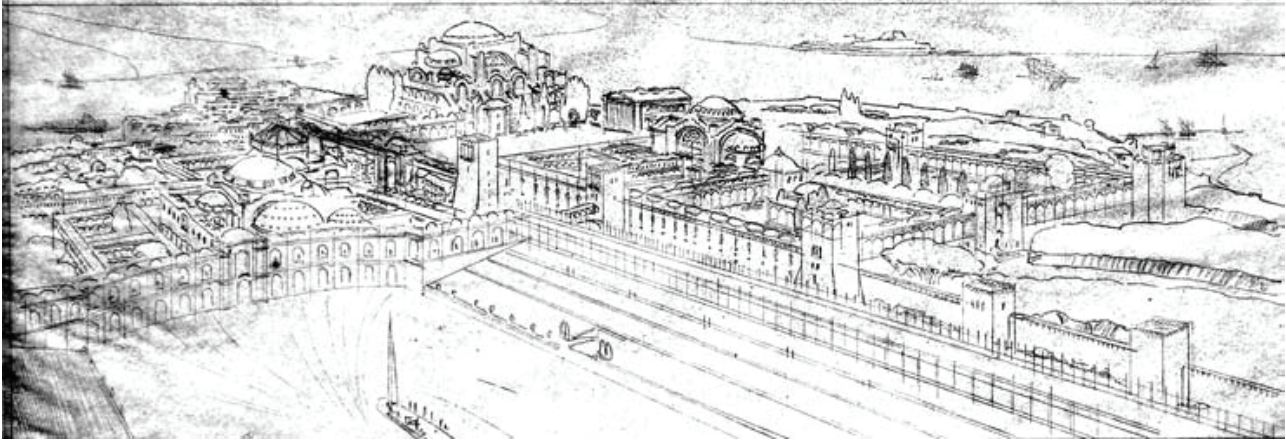
two weeks before the foundation of the Republic. Not only the Ottoman dynasty but also İstanbul, which had been the imperial capital for nearly one thousand six hundred years since Constantine the Great, was being dethroned by this radical decision.

There were several reasons behind the relocation of the capital. First, it was a symbolic act having historic reasons: Following the defeat of the Ottomans at the end of the WWI, the Treaty of Sèvres signed with the Allied Forces anticipated the division of Turkey into zones to be occupied. İstanbul was occupied by the British, the French and the Italian troops; the Greek Army embarked in İzmir and occupied Western Anatolia. Local resistances which spontaneously started against the occupation were finally organised and united around the National Assembly held in Ankara under the leadership of Mustafa Kemal against the will of the Ottoman government. The Turkish War of Liberation was directed by the National Assembly from Ankara from 1919 to 1922 while İstanbul was under occupation. The same National Assembly would decide the abolishment of the Sultanate in November 1922 and proclaim the foundation of the Republic as the expression of the sovereignty of the Nation in October 1923. The declaration of Ankara, the headquarters of the revolution as the new capital symbolizes both the end of the Ottoman Empire and the birth of the Republic of Turkey. Practical reasons such as keeping distance from the conservative circles of the old capital that were loyal to the Ottoman rule were also effective in the new regime's decision of relocating the capital to Ankara. In short, it reveals the republicans' determination to break with the Ottoman imperial past with which İstanbul was strongly associated.

The relocation of the capital to Ankara, situated at the centre of the national territory, was part of a strategy for the overall development of the country<sup>2</sup>. The reform movement towards westernization generated from the Ottoman capital since the beginning of the 19th century could not infuse into the remote parts of the country. İstanbul, with its westernised elite, remained isolated from the rest. Ankara, located at the heart of Anatolia, was to become a motor for the progress and development of the whole country.

The period that followed the foundation of the Republic is marked by the implementation of a comprehensive programme of reforms, not only at institutional level but also in the social and cultural domains. The construction of Ankara as the capital city had both a symbolic and strategic importance for the modernity project of the Republic. The new capital was to be constructed as a city that symbolised the modernity of the Republic. It would constitute a model for other urban centres, with not only its physical constructions but also its social and cultural institutions and the modern way of life of its inhabitants.

However, how this model city was to be created was a considerable problem, especially when the overall economic condition of the country, the financial difficulties, the lack of experience and of technological means are considered.



### **HENRI PROST, the “ARCHITECT-URBANIST”**

Henri Prost was one of the leading figures of the generation of French architects that contributed to the creation of the new discipline, which they baptised as “urbanisme”. We see him first among the graduates of the École des Beaux-Arts who won the Prix de Rome together with Tony Garnier, Léon Jausseley, Ernest Hébrard who all would become pioneering figures of the French urbanism<sup>10</sup>. Henri Prost’s acquaintance with Turkey and the city of İstanbul dates back to 1904, when he first came to the capital of the Ottoman Empire to study the archaeological vestiges of the Ancient Constantinopolis within the framework of the Prix de Rome programme. He stayed in İstanbul in 1904-1905 and 1906-1907 and returned to Paris with impressive drawings of Hagia Sophia and restitutions of the Imperial Palace of Constantine<sup>11</sup>.

Prost’s career as urbanist began with his winning entry for the extension of the city of Antwerp in 1902. He participated in the activities of the Sixth Section of the Musée Social, working on “Urban and Rural Hygiene”<sup>12</sup>. In 1913, he was invited by Marechal Lyautey, the military governor of the French protectorate in Morocco, to found the Service des Plans [the town planning office] under the French military government in this country. From 1914 to 1920 he realised a comprehensive planning work for several cities including Fez, Marrakesh, Meknes, Rabat and Casablanca<sup>13</sup>. Finally, starting in 1932, he directed the planning of the metropolitan area of Paris. The Plan d’Aménagement de la Région Parisienne would be approved in 1939<sup>14</sup>, thus three years after he began to work on the planning of İstanbul. The objective of planning adopted by Prost is to direct the metropolitan development and to control the urban extension around Paris through constructing a system of motorways while preserving historical and natural sites.



Henri Prost was contacted by the Republican government of Turkey first in 1924 for the preparation of the reconstruction plan of Izmir, destroyed by the fire in 1922 at the end of the Greco-Turkish war<sup>15</sup>. Although he delegated this task to his colleague René Danger, he worked actively as consultant in the planning of Izmir. This plan, which was approved by the Municipality of Izmir in 1925, constitutes the first comprehensive plan – plan d'ensemble – prepared to direct the future development of a city in Turkey.

### **PLANNING ISTANBUL: SETTING THE INFRASTRUCTURE FOR A MODERN CITY**

Within the revolutionary socio-political context of the 1930s in Turkey, the principal objective of planning the cities in general and in Istanbul in particular, was 'modernisation'. This was what the local authority expected to achieve by elaborating and implementing a comprehensive plan. What was meant by the modernisation of the city was also the arrangement of settlement areas conducive to modern life-styles and hygiene, and the creation of open public spaces that would contribute to the flourishing of a civic public realm. Henri Prost also defined the principal goal of the planning of Istanbul as the



modernisation of the city. According to him, this was inevitable for a city in the process of a “complete social change”.

Prost completed his Master Plan (plan directeur) for the European side of Istanbul in 1937. The master plan consisted mainly of a transportation plan, supported by detailed urban design proposals for strategic nodes of the plan. He proposed to reinforce the maritime transportation between the two sides of the Bosphorus<sup>23</sup>. The urban circulation network that Prost studied in detail was organized around a spine that crossed the city from north to south connecting the newly developing settlement areas on the north to the old city<sup>24</sup>. This road, which started at Taksim Square – the Square of the Republic – on the north, went through the old quarters on the west of Pera, crossed the Golden Horn by Atatürk Bridge and continued directly following the valley between the two of the seven hills of the historic peninsula. It crossed the old city from north to south to end up at the proposed central station at Yenikapı<sup>25</sup>. A second connection, in the north-south direction, started again from Taksim Square, crossed Pera and Galata through tunnels and viaducts before passing the Golden Horn by the Galata Bridge. On the historic peninsula, it continued through the central business district of Eminönü to reach Beyazıt Square

where the University of Istanbul was to be located.

In addition to these two north-south arteries that would connect the northern districts to the central activity areas located in the old city, Prost proposed a new circulation network to be created within the historic city. Partly making partly use of the existing street network, the new circulation system necessitated the opening of several new avenues and streets within the historic urban fabric. These were listed as “operations to be realized in priority” in the program of Prost’s master plan.

## **AN URBAN DESIGN TO GLORIFY THE HISTORICAL TOWNSCAPE OF İSTANBUL**

In his conference at the Institut de France in 1947, Henri Prost clarifies his approach to the planning of Istanbul particularly vis-à-vis the planning of the historic city:

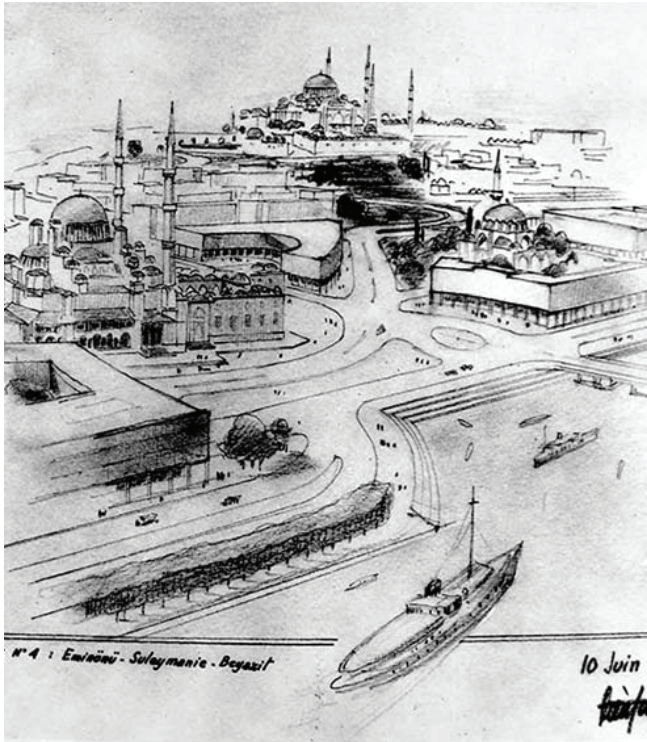
*“The modernisation of Istanbul can be compared to a chirurgical operation of the most delicate nature. It is not about creating a New City on a virgin land, but directing an Ancient Capital, in the process of complete social change, towards a Future, through which the mechanism and probably the redistribution of wealth will transform the conditions of existence. This City lives with an incredible activity. To realize the main axes of circulation without harming the commercial and industrial development, without stopping the construction of new settlements is an imperious economic and social necessity; however to conserve and PROTECT the INCOMPARABLE LANDSCAPE, dominated by glorious EDIFICES, is another necessity as imperious as the former”.*

Prost’s words summarize his attitude as a planner vis-à-vis the transformation of Istanbul: the objective of planning was to modernise the historical city, a goal which was mainly determined by the socio-political circumstances and the revolutionary atmosphere of the period in Turkey. Yet, for him, special attention had to be paid to the historical heritage of the city. In this perspective, he put forward a plan of urbanism which aimed to combine modernisation and conservation. As he expressed in these words, the protection of both the “incomparable” landscape and townscape of Istanbul was of primary importance – as important as the modernisation and economic development of the city.

Yet, in the planning of the old city, Prost adopted a highly interventionist attitude towards the historic urban fabric. The reorganisation of the road network that he proposed for the historic peninsula reminds, in fact, of Napoléon III’s and Baron Haussman’s operations in 19th-century Paris. The grand avenues that crossed the historic city and multiple secondary roads transformed the introverted neighbourhoods of the old Ottoman city into an open structure. One can argue that as fires had already destroyed large areas in the city, such operations were inevitable. In addition, the regularisation of the neighbourhoods destroyed by fire had become a tradition in Istanbul since mid 19th century, i.e. the beginning of the Ottoman reform movement. However, the operations foreseen by Prost







were not limited to the areas destroyed by fire, but brought forth an overall reorganisation of the urban fabric. Prost's plan was realising in a way an age-old project of modernisation in Istanbul that had already been put into implementation through piecemeal operations in the late Ottoman period.

His observations on the societal change in 1930s Istanbul and particularly the determination of the Republican authorities who undertook a comprehensive socio-cultural revolution must have been influential in Prost's interventionist planning approach. The revolutionary political context, but also the dynamics of social change in the Turkey of the 1930s, forced the architect-planner to intervene radically on the urban historical fabric of Istanbul.

## **URBAN ARCHAEOLOGY AND THE REPRESENTATION OF THE THREE EPOCHS OF İSTANBUL**

Revealing the memory of the ancient Constantinopolis buried under the Ottoman İstanbul was one of the goals of Prost's planning of the historical peninsula. Prost's interest in the Roman-Byzantine history of the city is obvious in his plan proposal and his reports. He attributed particular importance to archaeology as a means of bringing to light the memory of the past ages of the city. He combined "urban archaeology", which is a modern idea, with the modernisation of urban spaces.

Prost's particular interest in the East Roman vestiges of the city can be traced back to the studies that he had made in İstanbul as a young architect of the Prix de Rome. In his master plan of 1937, he proposed to create a park of archaeology on the eastern tip of the historic peninsula, at the site of the imperial palace of Constantine – the restitution of which he had worked on thirty years before. He continued to work for the realisation of this project until he left in 1951. The Park of Archaeology extends from the Sultan Ahmet Mosque [the Blue Mosque] on the south, to Hagia Sophia on the north and the Byzantine maritime fortifications on the east by covering a large area. It includes the Acropolis of the Ancient Byzantium, the Hippodrome and the Imperial Palace of Constantine and his successors. This park, where archaeological excavations were to be held, would be an open-air museum open to public.

However, the area, which was divided into private properties, was covered by constructions that had to be expropriated for demolition, which was bringing an enormous burden to the city's administration.

In his conference at the Institut de France, Prost stresses that his proposal for the Archaeological Park was approved by Atatürk, who had ordered the transformation of Hagia Sophia into a museum<sup>35</sup>. The Grand Basilica of Constantinopolis, erected in the 7th century by Justinian, was converted into the Grand Mosque by Mehmet II when he conquered the city in 1453. The decision for the conversion of the edifice from the Grand Mosque of the Ottoman imperial capital into a museum was certainly a powerful symbolic act. It was an expression of the determination of the Republic to break away from the Ottoman history by attacking one of its symbols of power. In his speech, Prost quotes Atatürk who declared that the edifice did not belong to one religion or another, but to all humanity. The architect extends this idea to the history of İstanbul, stating that it belonged to all humanity, rather than to one nation or another. The question whether this idea was shared by the Republican authorities can hardly be answered. Yet, we know that a number of archaeological excavations were started in several places in Anatolia in the early years of the Republic. The Temple of Augustus in Ankara was cleared of the constructions that surround it and restored with the initiative of Atatürk in the 1930s on the occasion of the celebrations of the 2000th anniversary of Augustus<sup>37</sup>. The aim was to link



the history of the Republic of Turkey to the universal history of humanity. Hence, Prost's proposal for creating an archaeological park at the heart of İstanbul was well received by the Republican authorities and by Atatürk in particular. Although the Park of Archaeology could not be realized in its integrity, parts of the Byzantine imperial palace were excavated and a new museum was built to display the mosaics of the palace in situ.

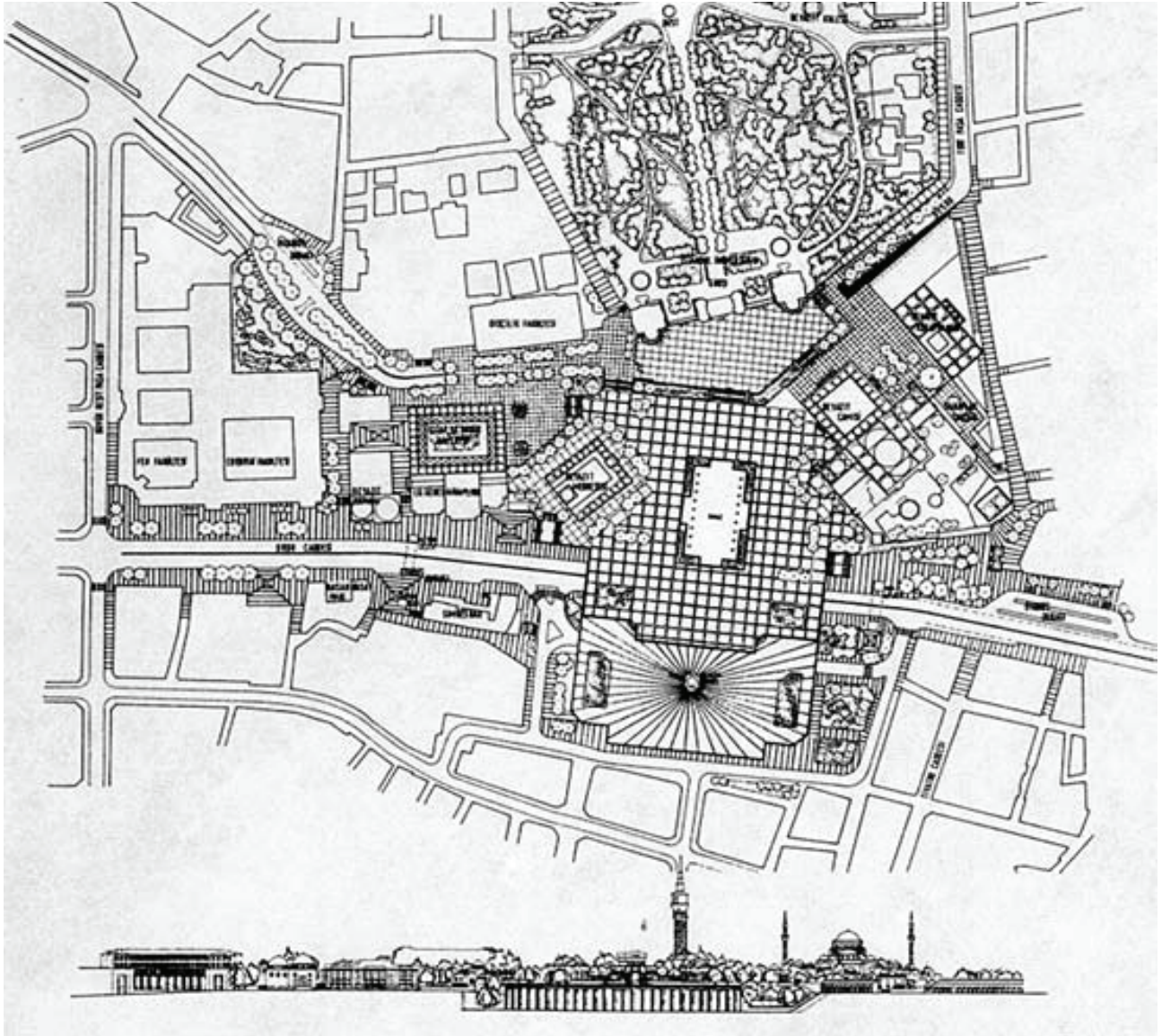
In Prost's plan, the Park of Archaeology was not the only reference to the East Roman history of the city. In his master plan of 1937, he proposed to rearrange the square – At Meydanı – in front of the Sultan Ahmet Mosque, which had been the hippodrome of Byzantine Constantinopolis, into a plaza crowned with a grandiose monument dedicated to the Republic. Hence, three eras in the history of İstanbul – the Byzantine,

Ottoman and Republican – could be symbolized at one place. He proposed to remove the buildings dating from the late Ottoman period, which are located on the southern edge of

the hippodrome, in order to open the perspective from the plaza onto the Marmara Sea, and to make this grandiose monument, located on top of the colossal retaining walls of the Byzantine hippodrome, visible from the sea.

Prost's proposal for Beyazıt Square was again founded on the same idea of simultaneous representation of the three epochs of the city<sup>39</sup>. This square where the Beyazıt Mosque – erected in the late 15th century – stands, and onto which the gate of the University of İstanbul opens, is located next to the Ancient Forum Tauri of the Byzantine city. Prost suggested enlarging the Beyazıt Square in the direction of the ancient forum, and reconstructing the triumphal arch that used to stand there, the remains of which certainly could be found, if excavations were made.

Prost's proposals for the two main squares of the historical city, the description of which we found in his report of the master plan, were not implemented. The operation to restore the Forum Tauri by the enlargement of Beyazıt square necessitated the demolition of old Ottoman structures including the Simkeş Han. It provoked the reaction of a number of Turkish intellectuals including architects. It is possible to observe that, in Prost's plan, the main arteries that cross the historical city from east to west follow the hypothetical trajectory of the main arteries of the Byzantine city. These radiated and branched off from the Mese – the first principal axis of the ancient city – towards the gates on the terrestrial walls on the west, following the crests of the seven hills of the city. In the 1950s, during the construction of these avenues, the Roman porticoes along these axes came to light. With the new arteries he proposed to open through the urban fabric, Prost referred to the remote history of Constantinopolis. He aimed at revealing the memory of the ancient city buried under the Ottoman İstanbul, while modernizing the urban infrastructure. One of the consistent efforts of Prost in İstanbul was for the preservation of the Byzantine fortifications that surround the historical city. Besides labelling them as monuments, he defined, in his plan, a zone of non-aedificandi covering an area of 500 m. outside and 50 m. inside the terrestrial walls, in order to conserve the walls in their integrity, and also to emphasise their monumental total effect.







02 PROJECT SITE ANALYSES : MARMARAY







alignments.

The Marmaray Project provides a a 76 km long uninterrupted modern high-capacity new railway system by full upgrading of the existing commuter rail system in İstanbul connecting Europe to Asia with an immersed tunnel under the İstanbul Strait. The main structures and systems include the immersed tube tunnel which is 1.3 km long, 9.8 km long bored tunnels excavated by tunnel boring machines, 2.4 km long cut and cover tunnels, three new underground stations, 37 new surface stations, operations control center, yards, maintenance facilities, upgrading of existing tracks including a new third track on surface, completely new electrical and mechanical systems and procurement of 440 modern railway vehicles.

## CHALLENGES OF THE PROJECT

This Project is one of the most challenging transportation infrastructure projects in the world at present. The immersed tunnel under the İstanbul Strait will be the deepest built so far, with its deepest point some 58 m under the water surface. The İstanbul region will most likely experience a seismic event of up to 7.5 magnitude during the life time of the Project. The geotechnical conditions of the Strait are of such nature that the connections between the bored tunnels and the immersed tunnel constitute a special challenge when it comes to seismic conditions. The immersion operations carried out in the stratified currents of İstanbul strait, where the upper current velocity reaches up to 5 knots. The deep stations and tunnels have to be constructed in an area where civilization can be traced back more than 8,000 years. Preservation and rescuing of Historical Heritage is a special focus point.

## SEISMICITY

The seismic design of the immersed tunnel was one of the most critical elements of the Marmaray Project because of the tunnel's proximity to the seismic fault system which is only 16 km away. The minimum seismic design requirements are based on a single-level design earthquake defined as the design basis earthquake (DBE).

Both probabilistic and deterministic hazard models were developed for seismic design. The initial probabilistic model employed was based on the homogeneous Poisson model. This, however, was not fully applicable to the tunnel because of the unique time-dependent behaviour of the fault system, so a time dependent conditional probability model was used to characterise the segmentation behaviour of the main Marmara Fault. The results of the analysis indicated an about 50% probability of an earthquake with a moment magnitude greater than 7 during the next 50 years. For the deterministic hazard analysis, an earthquake

of 7.5 moment magnitude was selected and assumed to take place 16km south of the immersed tunnel. Due to the importance of the project, the attenuation relationships used in deriving ground motion parameters (such as peak ground acceleration, velocity and displacement) were based on the median-plus-one standard deviation values.

## ENVIRONMENTAL CONSIDERATIONS

Besides the technical challenges, the Project involves environmental challenges due to the outstanding and unique natural and historical assets of İstanbul.

### Marine Environment

The main impacts of the Project to the marine environment are dredging of contaminated materials found near the Golden Horn, turbidity in general as a consequence of suspended fine materials and noise due to construction activities.

A total of 1,300,000 m<sup>3</sup> dredging has been carried out in the İstanbul Strait in order to excavate the trench to construct the immersed tunnel. ( Figure 3) Approximately 120,000 m<sup>3</sup> of contaminated soil was removed from the upper 3 meters near the outlet of the Golden Horn estuary on the European side. This material was barged and trucked to a confined disposal site some 30 km east of the tunnel site. In accordance with

Turkish and International laws and regulations a confined disposal site with a capacity of 250,000 m<sup>3</sup> was prepared specially for this project. The remaining dredged material was barged to a sea disposal area, the Çınarcık Ditch, 16 km south of the project alignment in the Marmara Sea. It is located in the North Anotolian fault zone and has a depth of 1,200 m, whereas the average depth in the Marmara Sea is around 200 m. The water quality at the disposal site before, during and after the disposal activities were monitored at three different depths and in 4 monitoring stations.

Another important issue that was considered during the dredging for the immersed tunnel was the fish migration through the İstanbul Strait. The length and start of the two fish migrations per year varies for each type of fish. However, it is generally accepted that the spring migration lasts from 15 March to 15 June, and the autumn migration from 5 September to 15 November. The migrations take place in parallel with the flow, as the flow in the İstanbul Strait is a strong, stratified two-layer system. The spring migration takes place from the Marmara Sea towards the Black Sea, in the lower saline layers that flow in the northern direction. The autumn migration takes place in the opposite direction in the upper non-saline layers that flow towards the south, or in the neutral zone between the upper and lower current. Turbidity of the water during the fish migration period was potentially the main problem. Fortunately, the currents in the İstanbul Strait are quite constant and always present. Therefore, the spill from the dredging concentrated in well-



defined and narrow areas and the fine debris was carried to the natural sedimentation areas in the marmara Sea and in the Black Sea.

Another problem was the possible noise impact created by the dredger. It is known that fish interpret continued noise as a barrier which they are reluctant to approach. During the fish migration period “Feedback Monitoring” was carried by a university and based on this data it was possible to take more precise decisions with regard to the continuation of the marine works.

## **HISTORICAL HERITAGE**

Istanbul was the capital of three empires, the Ottoman, Byzantine and East Roman Empire. The cultural artifacts unearthed during archaeological excavations in Istanbul, a town whose history stretches far back, are providing valuable information on Istanbul’s archaeology and history. Archaeological excavations carried out within the sites of underground stations, TBM tunnel portals and NATM access shafts. Although, the Marmaray



Project is desperately needed to ease the traffic congestion of 13 million inhabitants, the TBM tunneling works from Yenikapı towards Sirkeci could not yet be commenced as the archaeological excavations are still continuing at that location and a special pilot tunnel excavation pattern has been envisaged for the NATM tunneling works at Sirkeci in order to minimize the negative impact to the historical buildings over the tunnels. The archaeological excavations and the findings are explained in terms of their locations and interactions with the Marmaray structures:

Yenikapı: During excavations at Yenikapı the antique Theodosius harbour was uncovered. This harbour was built in 3rd century A.C. and was used until the 11th century A.C. Furthermore, the exploration revealed 32 shipwrecks from the 7th to 11th century A.C. After preparing measurement surveys and documentation, the ships are transferred by experts to special pools where for a period of 5 years they undergo conservation work. Following this treatment some of the ships will be exhibited at Yenikapı Station which was re-designed as a “Museum Station”. Below the Theodosius harbour remains, a fill layer dating back 8.000 years and ceramic pieces from the Calcolytic and Old Bronze Age were discovered.



\_Sirkeci: At Sirkeci, during the construction of 25 m diameter shafts, archaeologists uncovered a 13 m cultural fill layer with findings dating back to the Otoman, Byzantine and East Roman periods of İstanbul. The findings themselves and the depths of the layers in which they were encountered point at a historical development starting in the 6th century BC and continuing up to today.

Due to the existence of historical buildings at the surface level, in order to minimize the ground settlement over the NATM tunnels of Sirkeci Station, a sequential excavation procedure has been developed. It is decided to drive pilot tunnels through the platform tunnels and then perform the enlargement to the required dimensions. According to the analysis performed using the original excavation pattern, 30 to 70 mm of ground settlement was predicted. Considering the sensitive nature of the existing buildings, by introducing pilot tunnel approach, the expected settlements are calculated to be in the order of 20 to 30 mm.



## MARMARAY TRANSFER POINT PROJECT

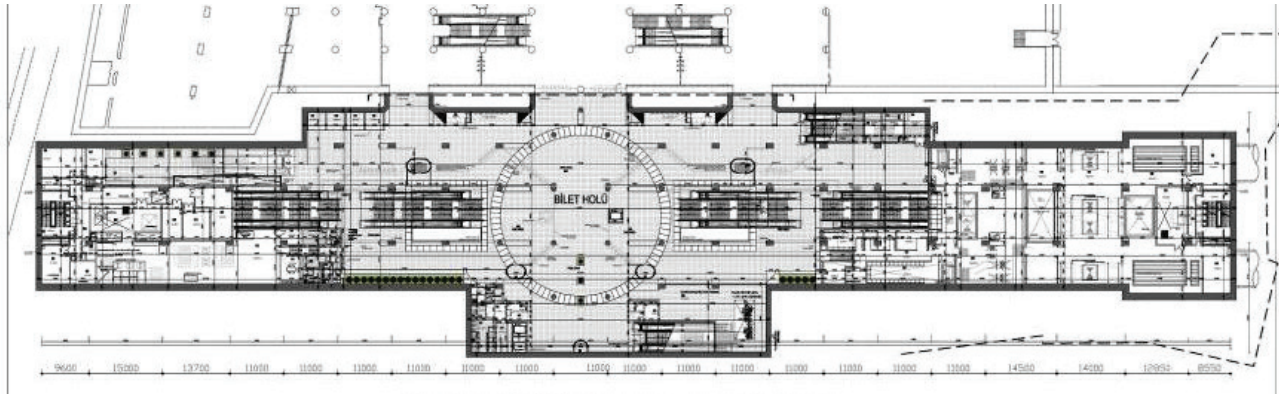
### Subject and the Purpose of the Project

The Project Area subject to service procurement is connected within its immediate proximity by the Aksaray-Airport Metro, Taksim-Yenikapı Metro (which is one of the most important railroad systems for the İstanbul Metropolis and located in İstanbul Historical Peninsula), the Marmaray Rail Tube Tunnel which connects European and Anatolian sides and İstanbul Sea Bus terminal (İDO).

The purpose of the Marmaray transport system is to provide continuous transportation via the rail system from one end of İstanbul to the other by connecting Gebze on the Anatolian side to Halkalı on the European side.

Yenikapı transfer point will soon become a vital strategic intersection point through which an average number of 1.700.000 people will pass on a daily basis.

Mustafa Kemal Boulevard, situated on the vertical axis to be connected to the transfer point, will become one of the main arterial roads which will connect the most important centers of the city (Şişhane, Tarlabaşı, Taksim, Şişli, Mecidiyeköy, Zincirlikuyu, Büyükdere, Maslak) to the coastal road. Considering its position and easy accessibility to the airport, there is no doubt that Yenikapı will become the “new gateway” of global İstanbul.



Excavations undertaken during the application of the transportation projects, both the remains of a 1600-year-old “Theodosius Port” together with the remains of “35 ancient ships” of the World’s largest fleet collection. At the same excavation area, 8500-year-old settlements of first Neolithic age were also found.

Due to such important characteristics of the area, the central goal for the project area is to create a contemporary transfer point and introduce/promote the importance of the location to both a global audience and to İstanbulites. The intended result will be achieved by re-designing the project locale both as a contemporary transfer area integrated with its surroundings in the city and as an attraction point where the archaeological findings significant for World History and Cultural Heritage can be showcased. Furthermore, continued scientific study support programs will further enhance the historical importance of the area. The total area of the Project is “27.7 ha” . In considering both the future interaction of the area with its surroundings and also the comprehensive data that will be given to the architects in the Design Brief, the designs presented from Invited Architects will consist of three parts:

An “upper scale urban vision” study which places Yenikapı in the Historical Peninsula and İstanbul,

An “urban design” study clearly explaining the organization of the entire area as a public space (location and program) and relationships established with its immediate surroundings,

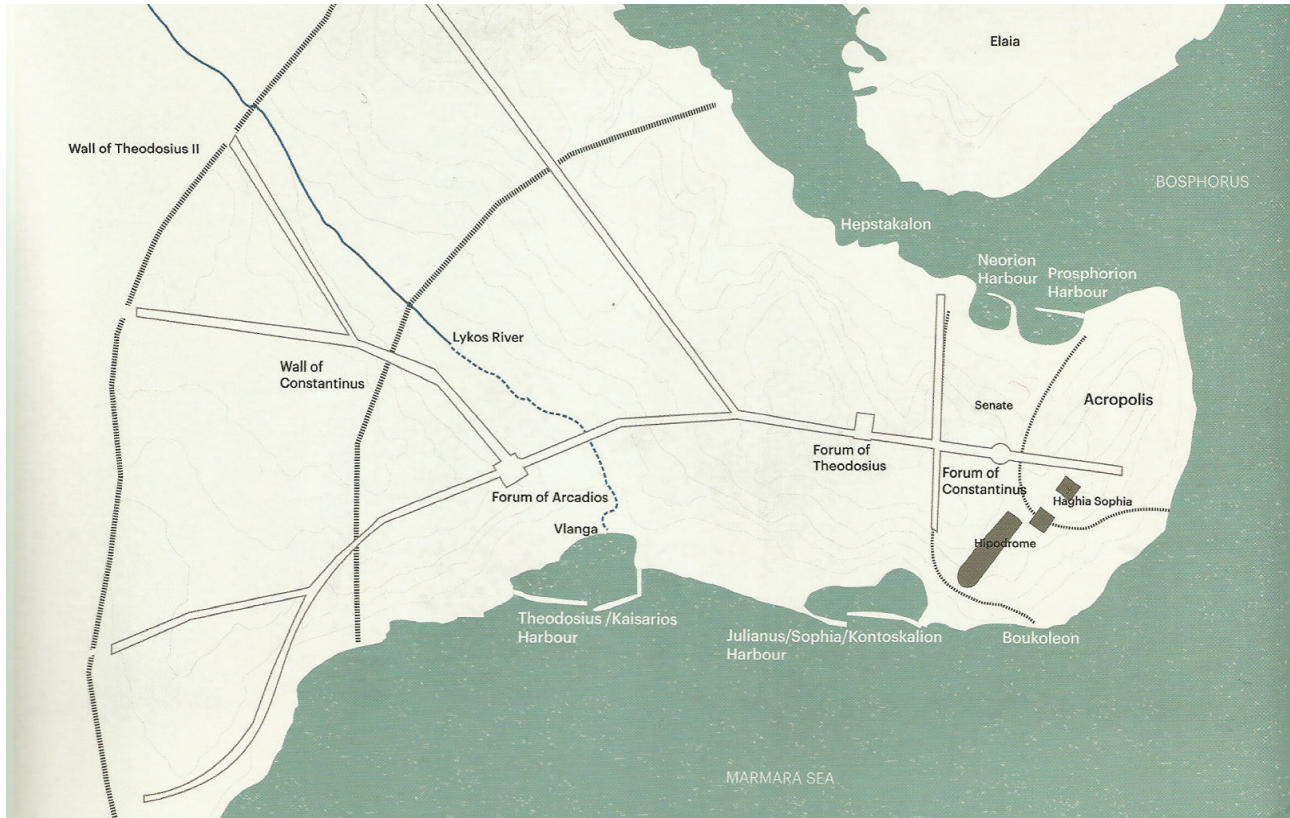
An “architectural preliminary project” which illustrates the richness of the program, organizations of locations and architectural characteristics in relation to Transfer Center and City Archive buildings will be provided.





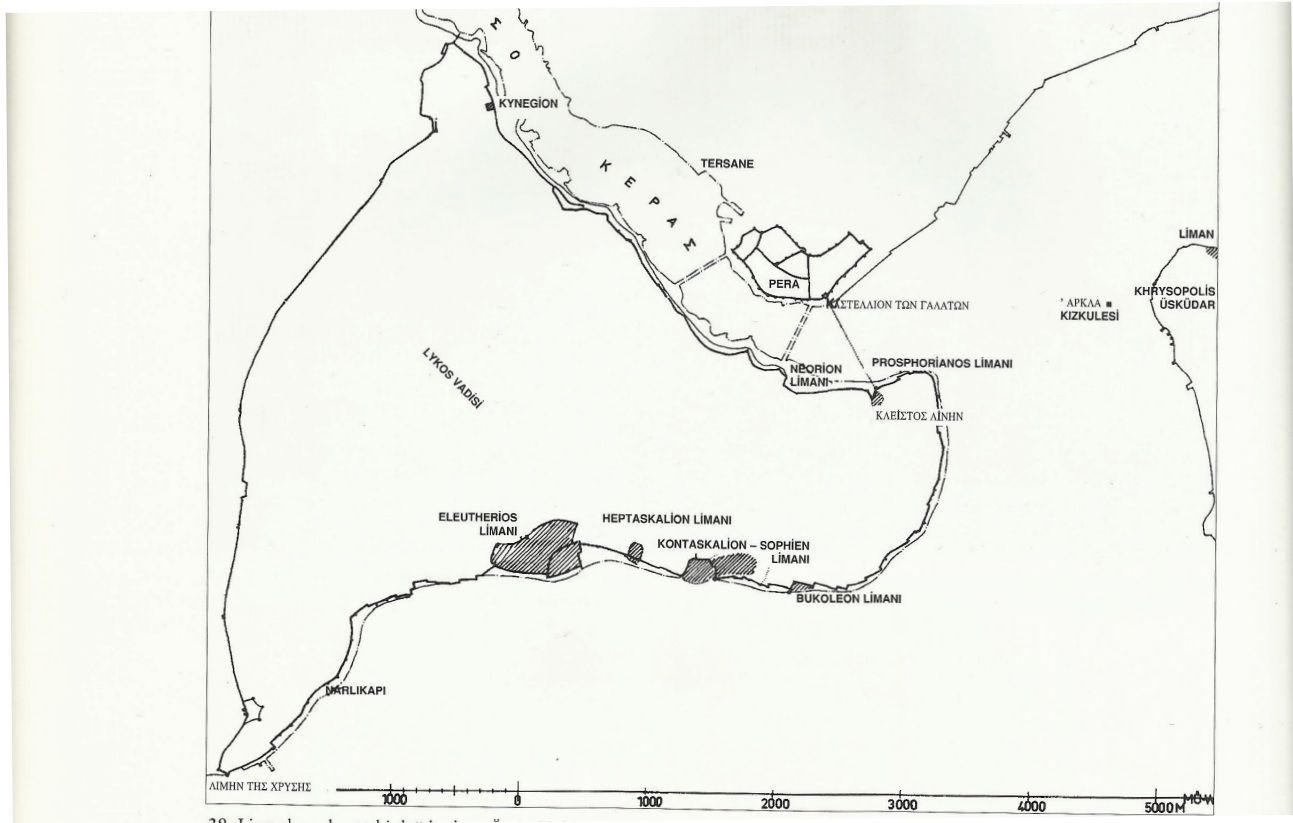
03 PROJECT SITE ANALYSES : EXCAVATIONS





## THE HARBORS OF BYZANTINE CONSTANTINOPLE

Any discussion of the port facilities of Byzantine Constantinople has to begin with the Golden Horn and with the fact, well articulated by Byzantine writers, that the whole inlet constituted a large, protected harbor where ships could moor, anchor or be beached almost anywhere along the coast. The Golden Horn was sufficient for the commercial shipping of Ottoman İstanbul without the need for elaborately constructed quays and breakwaters, and this appears to have been the case by the end of the Byzantine period. However, early Constantinople, and ancient Byzantium before it, had invested heavily in harbor constructions. Indeed, the history of the city's port capability from Antiquity to the later Middle Ages may be described as a gradual shift from the emphasis on artificial stone harbor basins to the ubiquity of wooden landing stages running perpendicular to the



coast, both inside and outside the designated harbors.

When Byzantium became Constantinople in 330 AD, it was served by two adjacent harbors on the Golden Horn, the Prosphorion and the Neorion, each enclosed by a fortified mole to the north, leaving a narrow entrance on the western side. As the new imperial capital expanded in the course of the 4<sup>th</sup> century AD, two new harbors were added on the Marmara coast, both named after the emperors, Julian and Theodosius I, who were mainly responsible for their construction. All four harbors are listed in the *Notitia* of Constantinople from C. 425 AD.

### Prosphorion

This harbor (also referred to as Bosporion or Phosphorion) was in the area of modern

Sirkeci, and the recent rescue excavations in the area of the railway station appear to have uncovered remains of the harbor installations. After the *Notitia*, the Prospohorion is only mentioned twice in the sources: as a place where a cattle market was held “at the *sigmashaped* wall” until the 8<sup>th</sup> century, and as the coastal area densely colonized by Italian immigrants in the late 12<sup>th</sup> century. It can be identified with the coastal neighborhood where the Genoese were granted houses and landing stages in 1169; significantly, the documents concerning these grants do not name the harbor or even mention it as a unit.

### **Neorion**

This harbor, located to the west of the Phuspohorion, somewhere between today’s Sirkeci and Eminönü, is much better attested, perhaps because it was larger, perhaps because it was used for both commercial and naval purposes. It may have had two basins; it certainly included a naval dockyard and arsenal (*neorion*, *exartysis*) as well as the main basin, which one text calls “the lake of the Neorion” A related text states that Justinian (r. 527-565 AD) transferred the wholesale markets of imported produce from the Neorion to the Harbor of Julian on the Marmara coast. There is other evidence to suggest that the Neorion, and indeed the whole Golden Horn area, went into relative decline in the 6<sup>th</sup> century, from which it did not emerge until the 10<sup>th</sup>. However, the harbor was dredged in 698 AD, probably for military use. By the 12<sup>th</sup> century, the extramural land outside the Neorion Gate was extensively built over, which suggests that the sea had receded and the original harbor basin had become filled in. The waterfront was still, however, occupied by *skalai* (wharfs or jetties). While those to the west of the Neorion Gate were given to the city of Pisa, the shore to the east seems to have remained under state control, since documents of 1197 and 1203 concern a ship that moored “by the coast of the Neorion” in order to be measured by the ‘officials of the imperial maritime bureau. The Harbor was remembered as the “old *neorion*” in the late 13<sup>th</sup> century.

### **The Harbor of Julian/Sophia/Kontoskalion**

The first reliably attested construction of a harbor on the southern shore of the city is attributed to the Emperor Julian (r. 361- 363 AD), although it is unlikely to have been completed during his short reign. It was located in the modern area of Kumkapı, where its site is indicated by a curve in the line of the sea walls and the remains of a breakwater that were visible up to the 20<sup>th</sup> century. The harbor, referred to as the “new port” in the *Notitia* of Theodosius II, was dredged around the year 500 AD by the Emperor Anastasius. It was then completely renovated in the mid-6<sup>th</sup> century.

The sources attribute this measure to Justin II [ (r. 565-578 AD), and the harbor was renamed after his wife Sophia, but it is likely that the operation began under the reign of their predecessor, Justinian I, who is said, as we have seen, to have transferred the wholesale markets to this location from the Golden Horn. From the written evidence, the Harbor of Julian-Sophia appears to have been the main port facility of Constantinople from

the 6<sup>th</sup> to the 11<sup>th</sup> centuries. It may have declined in the next two centuries with the growth of Italian commercial activity beside the Golden Horn, but the fact that the Emperor Isaac II (r. 1185-1195) converted a nearby aristocratic palace into a *pandocheion*—a *han*—that could provide food and lodging for 100 visitors with horses or mules suggests that the harbor was still open for business at the time of the Latin Conquest in 1204.

The Harbor of Julian-Sophia was also known as the Kontoskalion, or Kontoskelion, after the name of one of the gates leading to it. Under this name, it enjoyed a new lease of life in the last two centuries of Byzantium as a naval base for the imperial war-galleys. The dredging and fortification of the basin was begun by Michael VIII Palaiologos (r. 1261-1282) and finished under his son Andronikos II (r. 1282-1328); the harbor was dredged again in 1427. It could shelter up to 300 galleys, and its entrance was protected by gates in the form of iron grilles. Its military function continued under the Ottomans, as the modern name of the neighborhood, Kadırgalimam, which now occupies the space of the former harbor basin, still attests.

### **The Harbor of Theodosius I/Kaisarios**

Very little is known from Byzantine written sources about the harbor listed as the *portus Theodosianus* in the 5<sup>th</sup>-century *Notitia* of Theodosius II. From the 6<sup>th</sup> to the 9<sup>th</sup> centuries, it is referred to as the “Harbor of Kaisarios,” after the name of a nearby neighborhood, and subsequently it disappears from the record. From the 12<sup>th</sup> century onwards, the locality, was known as Vlanga, and is mentioned in connection mainly with the local buildings, the sea walls, and the Jews who were settled there and operated their tanneries after 1261. A document of 1400 refers to a market garden outside the walls, thus foreshadowing the primary function of the neighborhood in Ottoman times, when it was known as the “Langa Bostanı.”

However, the size and shape of the harbor basin have long been apparent from the configuration of the sea walls and the breakwater at the mouth of the Lykos River. Now the Marmaray-Metro excavations at Yenikapı have made this the best documented of all the city’s ports. The archaeological finds reveal the harbor to have been far more important, and to have had a much longer history, than the written record suggests. The stone harbor quayside and surrounding walls are of Theodosian construction (late 1 4<sup>th</sup> century), but they overlie the remains of earlier structures. The excavated area was criss-crossed by substantial remains of the posts of long wooden jetties extending deep into the harbor. They were clearly added and extended in response to the progressive silting and sanding of the harbor basin. Analysis of the timbers has suggested that they cover almost the whole Byzantine period, with the oldest in the western part of the site and the newest, dating from the end of the 14th century, towards the south-eastern extremity. In addition to these jetty-posts, the excavations also uncovered, in the eastern part of the site, the very substantial remains of a large masonry pier, datable from its construction

techniques and timber samples to the very end of the 8<sup>th</sup> century. This suggests that there was a considerable investment in the port and in commercial shipping around the year 800 AD, perhaps associated with the renovation of the neighboring area by the Empress Eirene (r. 780-802 AD) and the financial incentives offered to the city's ship-owners by her successor, Nikephoros I (r. 802-811 AD).

The fact that a large number of the shipwrecks found at Yenikapı date from around the turn of the 11<sup>th</sup> century would seem to indicate that the port remained busy up to this date. However, the absence of any later wrecks can be taken, correspondingly, as an indication of subsequent decline and abandonment. This is corroborated by a striking piece of evidence that the accumulation of soil and sand was allowed to continue unchecked: the remains of a 12<sup>th</sup>- or 13<sup>th</sup>-century church built inside the harbor basin not far west of the masonry pier.

To this picture we should add the testimony of several 14<sup>th</sup>-century travelers that large numbers of human bones were visible in the ground at Vlanga, no doubt indicating the presence of a cemetery, although this was found within the excavated area.

### **Other Harbor Locations**

In addition to the four artificial urban harbors that are known to have had constructed harbor basins and protective breakwaters, the sources mention several locations where boats docked, but there is no indication of the degree of construction involved. These were as follows, from east to west:

On the Golden Horn:

\_The Chalcedonian landing-stage (*scala Chalcedonensis*) mentioned in the *Notitia*, and possibly to be identified with a landing at the Eugenios Gate (in the vicinity of the Yah Köşkü) that is attested in the Late Byzantine period.

\_The landing-stages/wharfs acquired by the Italians in the 11<sup>th</sup> and 12<sup>th</sup> centuries.

These occupied the whole area of Sirkeci and Eminönü on today's map, including the Prosfhorion harbor, but excluding the Neorion.

\_The Heptaskalon. The Emperor John VI (r. 1347-1354) in his memoirs records that the harbor (*neorion*) "towards the Heptaskalon" had silted up over many years before he had it dredged in 1351, to enable cargo vessels to dock there. The Heptaskalon, meaning "seven landing-stages," was a stretch of coast including the Zeugma, a crossing-point of the Golden Horn corresponding to modern Unkapanı, now marked by the southern end of the Atatürk Bridge.

\_The harbor (*neorion*) "towards the monastery of Christ Evergetes which was used by

the Venetians during the Latin occupation. The monastery was situated near the modern Ayakapı, so the harbor should be sought in this area, or just conceivably, directly across the Golden Horn, in which case it could be identical with the following.

\_The naval shipyard (*exartysis*) to the west of the suburb of Galata, probably corresponding to the *navalia* of the *Notitia*. It was known as the “old *exaitysis*” by the late 13<sup>th</sup> century.

\_The “disembarkation facility” (*apobathra*) that served the Palace of Pegai, which scholarship locates on the hill at Kasımpaşa.

\_The Blachernae. The docking area that served the imperial palace was sufficiently important to be considered a harbor (*neorion*) in the 13<sup>th</sup> century.

\_The location at Kosmidion (between Ayvansaray and Eyüp) that was used for shipbuilding in the mid-14<sup>th</sup> century and possibly earlier.

On the Bosphorus and Marmara coast:

The “landing-stage of the acropolis” mentioned in the 7<sup>th</sup>, 10<sup>th</sup> and 12<sup>th</sup> centuries, possibly corresponding to the *scala Timasi* of the *Notitia*. It was just to the south of the acropolis point (Sarayburnu) and was marked until 1204 by a semi-circular colonnade. It gave access to a ceremonial gateway, which can be identified with the Topkapı of the Ottoman palace.

\_A landing-stage that served the monastery of St George at the Mangana. It was probably near the closest gate in the sea walls (the Demir Kapısı?).

\_A landing-stage near the Arkadianai, the area named after the *thermae* built by the Emperor Arcadius. It was probably near one of the gates in the sea wall south of the İncili Köşk.

\_The Harbor of the Boukoleon. This was the port of the imperial Great Palace, and it was probably created in the 7<sup>th</sup> century, unless it was identical with the earlier Harbor of Hormisdas, which cannot have been far distant. Unlike the other ports on the Sea of Marmara, it was not marked by a major indentation in the sea walls; it was, however, protected by two massive moles projecting into the sea, if we can believe the evidence of the Buondelmonti map.

\_The Harbor of Eleutherios. This is sometimes identified with the Theodosian Harbor, but the only source for its existence states quite clearly that it existed before Theodosius, who filled it in with the debris from the construction of his monumental forum. Its site was no doubt marked by the later Palace of Eleutherios, a construction (or reconstruction) of the Empress Eirene (r. 780-802 AD) to the east of the Theodosian Harbor.

\_The landing stage serving the Golden Gate, near the junction of the land walls and the sea walls. Marked today by the Mermerkule.



### The Suburbs:

Numerous harbors are attested along the waterways around Constantinople. They were used for transport to and from the city, as staging posts to more distant destinations, and as nodes of commercial traffic in their own right. On the Asiatic side, we may mention the main crossing points from the city at Chrysopolis (Üsküdar), Chalcedon (Kadıköy) and, further afield, Pythia (Yalova), as well as the harbor constructed by Justinian at the Palace of Iereia (Fenerbahçe). On the European side, there were constructed harbors serving the suburban palaces of St Mamas on the Bosphorus (near Dolmabahçe-Beşiktaş) and of the Hebdomon on the Sea of Marmara (Bakırköy). Finally, we may note that a mid-6<sup>th</sup> century historian refers to the town of Region on the inlet now known as Küçükçekmece to the west of Atatürk Airport, dimply as “the port of Constantinople.” The recent discovery of a long late-antique wall running around the head of the inlet suggests that this statements may have no exaggeration.

### THEODOSIAN HARBOR LIFE IN İSTANBUL IN ANTIQUITY

In excavations carried out to date, four formation phases of the area have been clearly identified. The first of these was the period i n»hen the area was used as gardens after the Harbor was filled (12\*h-20lh centuries AD); the second was the period of harbor activities in the natural bay in Greek and Roman times, which we do not consider to have been systematic (6th century BC-3rd century AD); the third was the period in which the area was used as a trading harbor (4th-11th centuries AD); and the fourth was the Neolithic Period located below the harbor floor. The main theme of the exhibition is the Theodosian Harbor and the loaded wrecks in the harbor, and it will present finds from these four phases of the harbor.

In the light of the remains and finds from the harbor, which are partly featured in the exhibition, it will be useful to overview the development of trade in the city between the 6th century BC and the 11th century AD.

It is known that Byzantion, the core of Istanbul, was founded in mid-7\*h century BC to get a share of the Black Sea trade, which was growing and developing within the scope of the colonization movements in the region. Finds from this period retrieved during the excavations at the Theodosian Harbor are unfortunately too little to compare with other periods. Before the excavations at the harbor, concrete data about the trade activities of the period consisted of imported ceramic finds from various excavations, especially excavations in and around Topkapi Palace. Finds from the period when there were no systematic harbor activities in the area can be considered as the remains of goods carried by ships that came to the city for trade purposes, but could not reach the central harbors of Neorion or Proosphorion for various reasons and took refuge in this natural bay. Among the reasons one can think of the famous currents and storms of the Bosphorus and the Sea of

Marmara, as well as pirating activities. In addition, illegal trade activities are considered to have been among the possible reasons why these finds were in the area. All of the few finds from the 6th-4th centuries BC were unearthed on the stone floor of the harbor by the excavations.

The number of Archaic, Classical and Late Hellenistic period finds is clearly not proportional with the trade activities of the city in this period. For example, within the scope of the Marmaray Project, and during the excavations in Sirkeci area, thousands of finds evidencing the intense trade activities between Byzantium and other cities, such as stamped amphora handles, were unearthed. The scarcity of finds from this period at the Theodosian Harbor is a result of its location off the city center and the lack of systematic harbor activities as mentioned above. Finds from the period in the exhibition are predominantly Corinthian made aryballoi and oinochoai found complete or in fragments, amphorae from Chios, Thasos and Samos, and varnished! ceramics produced in Atticâ.

With Rome coming into Aegean and Pontus regions from the 2nd century BC onwards, Byzantium became a city under Rome in 146 BC. The power of the empire in its early phase and the peaceful environment it provided also affected trade. Textiles from Edessa, Antioch, and Alexandria; wine, oil, and spice« from Syria; parchment from Egypt; wheat from Egypt, Africa and Spain; wine from Galia and Italy were sent first to big harbors j and then to inland areas, and Byzantium, an important harbor city, was naturally a part of this trade system. However, the city saw a great destruction in 3rd century AD. Emperor Septimus Severus destroyed Byzantium, which supported his rival Pecinnus Niger in his fight for the throne and incorporated it under Perinthos (Marmara Ereğli). The years following this period were a period of preparation for the year 330, in which the city would see great honor after difficult years.

Yenikapı excavations revealed finds from the Roman period, mainly amphorae. As in the previous period, the finds are of great importance for the history of İstanbul, since previous studies and ancient sources do not record any trade activities in this area.

#### **4th- 7th centuries AD**

We know that by the 4th century the economic and cultural center of gravity of the Roman Empire shifted to the east as a result of invasions by people whom the Romans called barbarians, and the search for a new imperial capital has begun. It seems that the cities around the Sea of Marmara were in an advantageous position to become the capital. Besides Byzantium, which was to become the capital, Nicomedia was among the candidate cities. However, Byzantium was set apart by its strategic location. This process worked in favor of Byzantium in and after 324 when Emperor Constantine began to rule by himself and inaugurated the new capital with a ceremony on May 11, 330, following a rapid and

great development activity. The new capital was named Constantinople after the emperor.

As a result of the privileges granted to the city, its population increased in a very short time and reached 200.000. This population growth brought about a subsistence problem in the city. Need for grains particularly stood out. In addition, building materials for the development of the city and everything that a city needs had to be imported.

It was clear that new harbors were needed to enable activities of this capacity. The old Harbors of the city were not planned for a city with a population of 200.000. When Emperor Constantine I chose the city as the capital, he doubtless planned its development also.

In accordance, main streets and squares of the city were planned starting from the main square Augusteion, and it was clear that the city was going to expand to the west within its natural development area. The new harbors to be built should have been located accordingly. The old harbors at the center continued to be used, but new harbors were to be established in an area that was suitable for expansion to the west with its geographical and topographical properties. The most suitable areas for the new harbor or harbors were natural bays to the south of the city. One of these bays was located in the area of modern Yenikapı. The harbor built in this area by emperor Theodosius I (379-395) was named "Portus Theodosiacus" after the emperor. The harbor in area 9, to the east of the harbor built in area 12, was conceived as the unloading point for the grain imported from Egypt as hinted by the name "Horra Alexandriana."

4th to 7th centuries is the period in which the harbor was most actively used and with the most numerous and variety of finds. The empire was in control of the whole Mediterranean, and made use of all Mediterranean harbors and the goods of other regions that came down to these harbors. At the same time, trade relations with the Black Sea continued. We can say that Constantinople, the capital of the empire and one of the most important harbor cities, had intense trade relations with these regions through the Theodosian Harbor and other harbors.

The goods that were traded made up a wide range, including grains brought from Egypt by special fleets, other foodstuffs, all kinds of raw materials for local production, wood, tiles and marble for construction, luxury goods, livestock, and slaves.

Finds evidencing these trade activities were unearthed at the excavations at the harbor. In particular, amphorae from various regions point to trade with these regions. These vessels, used for transportation of trading goods in antiquity were found in great numbers, both complete and in fragments. As a result of the analysis of these finds, it was proven that İstanbul, or Constantinople as it was called then, had trade relations with Egypt and Carthage as evidenced by plates with impressed decoration, some types of which are known to have been produced on the Aegean coast, in Greece and İstanbul, but accepted in general to have North African origins; with Eastern Mediterranean harbors as evidenced

by amphorae of Lebanon-Tripoli origins, amphorae with Palestine origins, and lamps with Syria-Palestine origins; and with Aegean, Black Sea, and Balkan regions as evidenced by similar regional finds. In addition, trade with certain cities can be proven through coins, which are among the most important trade objects. For example, gold coin of emperor Leo I minted in Thessalonica, bronze coin of emperor II minted in Cyzicus, and bronze coin of emperor Maurice Tiberius minted in Nicomedia are significant as evidence of trade between Constantinople and nearby cities. The mentioned objects are only those about I whose origins we have detailed information. In addition, objects with a distribution area from Britain to the Black Sea, Mediterranean, and Africa were retrieved during excavations. More detailed studies, especially focusing on material analysis, will certainly supply precise information on the origins and functions of many more objects.

To illustrate the variety of objects from the period, we can mention amphorae of Yassiada type 1 and type 2, an ivory Nike relief, a baked clay perfume oil bottle, bronze weights in the form of Athena, scales, bronze lamps solidus coins of emperor Theodosius, a lead seal of eparikhon Petros, which is also a very important object for trade, glass stamps for weighing the coins monogrammed with the governor in charge, and many Asia Minor type lamps.

Yenikapı 35, one of the main subjects of the exhibition, dates to this period of the harbor. Judging by the building technique and dimensions, it is a seagoing trader, and it dates to the 4th -5th centuries. Its identification and excavation was carried out by specialists from the İstanbul Archaeological Museums.

The cargo of the ship predominantly consists of numerous and various amphorae and other vessel types. Studies done so far have shown that some of the amphorae were of Sinop and Romania origin. It has also been determined that at least part of the material transported in the amphorae was salted fish. Amphorae lamps, sheaves, perfume bottles, pans, kitchen pots, spoons, wooden miniature ships and other finds from Yenikapı 35 are part of the exhibition.

### **7th-8th centuries AD**

With Arab conquests in the Mediterranean region in the 7th century, which had been a Byzantine lake, especially the eastern part of the the Mediterranean went out of Byzantine control. With the loss of the eastern provinces, the leadership role of Byzantians in the Mediterranean came to an end and Byzantians had to share the revenue of Western and Eastern Mediterranean trade with Arabs. Parallel to this general state of the empire, there were changes in trading activities of the capital, especially in terms of regions with which trading relations were kept. The center of trading activities was now Greece and Black Sea. İstanbul would naturally benefit from these developments. It would increase its tra-

ding activities again in the following century.

As a result of these developments in the 7th century, imports of grains from Egypt stopped and the Theodosian Harbor lost one of its most important functions. Although the harbor was going through a crisis in the 8th century, it continued its function. The effects of the loss of the eastern harbors is reflected in the decline in the excavation area of finds from the period. Finds decline both quantitatively and in variety. Amphorae of probably Aegean origin, a perfume oil bottle of Asia Minor origin, two baked clay vessels of Asian origin with human faces depicted on them, a lead seal of Archon of Cyprus, and a lead seal of Archbishop of Amasya are among the finds identifying the trade relations of the period. Although there are objects whose classification and study continue, results that would change the general view of the harbor in this period are not expected.

### **9th-11th centuries AD**

The increase in the number of finds from the excavation area suggests that Constantinople turned the disadvantage of the empire in trading into an advantage by shifting the center of trade to the north in the 9th century after the transition period in the centuries. This increase also reveals that trade mechanisms re-established its internal balance, escaping the effects of Arab conquests and achieving the revival of trade. In spite of the increase in the number of finds in the 9th- 11th centuries, we do not observe the variety of finds in the early period of the harbor. The decrease in the number of regions traded with and concentration on the trade with the Balkans, Greece and Black Sea can be shown as the reasons for this situation.

We observe a new development in Byzantine trade from the 9th century onwards. This development was the appearance of Italian city states in the trading activities of the empire; this development would be much more effective later on and would eventually take over Byzantine sea trading completely. From the late 9th century onwards, traders first from Amalfi and then from Pisa and Genoa; and from the 10th century onwards, traders from Venice gained various trading privileges in Byzantine Empire and settled in areas of Galata and around the Golden Horn. Around the same period, Russian and Bulgarian traders also were visiting the city for intense trading relations, although not as much as the Italians.

As a result of these trading privileges granted to Venice and Genoa, almost all trading activity became under the control of these cities from the late 11th century onwards. Genoese and Venetian harbors in Galata, Crete, Euboea, and Crimean Kaffa were the most important harbors. This shifting trading balance in Constantinople also affected the harbors of the city. Trading activities shifted again to the area where the old harbors of the city were located at the start of the Golden Horn and to Unkapam further west, because the trade system and centers of economic life were located in this part of the city and be-

cause the physical conditions were more favorable.

In parallel with this situation, it is possible to say that the harbors on the southern side relatively lost their importance. We also know that the Theodosian Harbor lost its importance after the 11th century and was slowly filled in. We can say based on the finds that especially in the 12th century it lost its trading harbor character.

Most of the finds from the harbor from this period consist of amphorae and glazed and unglazed vessels for everyday use. Amphorae

are also not as rich in variety as in the first 9 period. Most of these are amphorae called Günsenin amphorae, produced in and around\* Tekirdağ Gaziköy, and Crimea, Black Sea amphorae. Another find group is lead seals. Some are directly related to trading tasks, while others are related to official and religious tasks. A solidus coin of emperor Theophilus can be given as an example of finds of important trading tools of the period.

Like many wrecks unearthed at Yenikapı, wrecks Yenikapı 1, 3, and 12 belong to this period. Of these, Yenikapı 3 is considered to have been a seagoing vessel from the 9th century, and its cargo to have consisted of construction materials as many roof tile fragments, stamped bricks and marble fragments were found within it. Stamped bricks retrieved from the wreck are a part of the exhibition.

Yenikapı 1 wreck belongs to a vessel that was engaged in coastal trade around the Sea of Marmara in the 10th-11th centuries. The vessel was quite old when it sank, and had gone through several repairs. Its cargo consisted of Günsenin amphorae. Provisionally, we can say that wine from Tekirdağ and its vicinity were transported in the amphorae. These amphorae are exhibited together with other finds such as combs, belaying pins, and anchors.

Yenikapı 12 wreck, which had been a symbol of Yenikapı excavations at some point and featured in almost every publicity work, belongs to the 9th century and its cargo most consists of Crimean amphorae. The wreck belongs to a smaller vessel, and within it gaming pieces, thimbles, needles, and within its quite small kitchen a brazier, kitchen pots, and cherry pits in a straw basket were identified.

Because passenger transportation was insignificant compared to cargo transportation in the vessels, which were generally not very-large, we know that cargo ships were minimally furnished. In overseas vessels there were no cabins other than a few on the upper decks; these were reserved for the captain, the owner of the cargo, or their representatives. Moreover, there was no serving of meals. Only water and accommodation were provided. One needed to wait in a line in the single small kitchen in order to prepare meals. Wooden plates and spoons retrieved from the quite small kitchen of this small vessel unearthed in Yenikapı confirm the information gathered from written sources and the excavations.

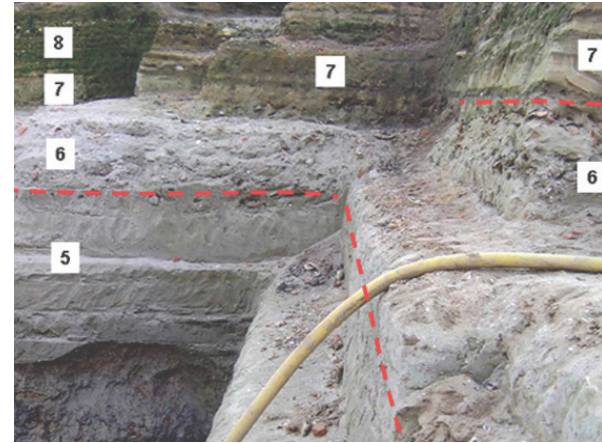
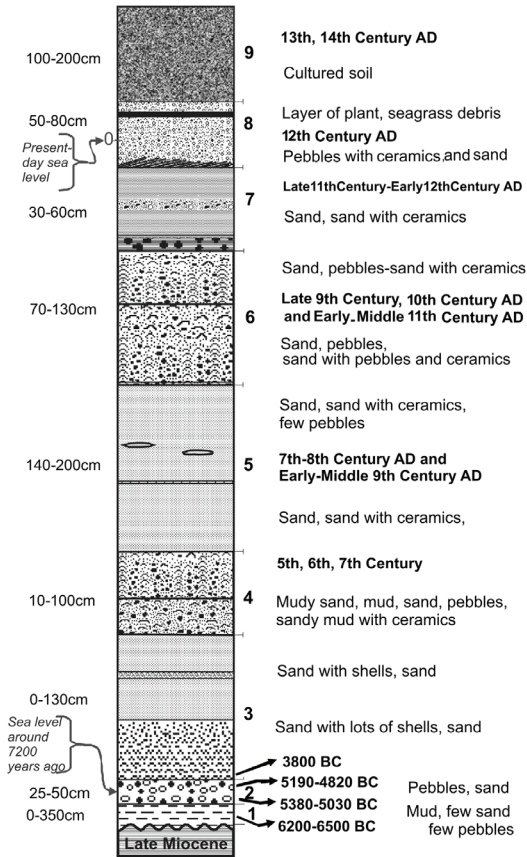
It seems that the sailors and the passengers, whether on the ship or in the harbor and its vicinity, and those who had to earn a living in the harbor did not have very easy lives. The finds from the excavations suggest that the lives of the crew, as well as the passengers, were full of similar difficulties. Eating from simple wooden plates and sleeping in uncomfortable beds, sometimes under negative sea conditions, they hoped to complete their voyage and to arrive at the harbor.

## STRATIGRAPHICS SUCCESSION

Sections in six stations were measured in the Yenikapı excavation site and generalized stratigraphic section was obtained making numerous point observations (Figures 2, 3). 9 different units were distinguished from bottom to top on the site of excavation in terms of lithological features. Late Miocene - Holocene units form the Pre Quaternary basement of the excavation site. All units forming the site of excavation will be introduced in detail starting from the 1st unit at the bottom.

### 1st Unit

The 1st unit is represented by dark gray to black colored sandy mud in patches (Figures 2, 4). Crushed, dark brown rush stalks are observed in mud indicating to a swamp environment. After the unit had been deposited in lagoonal environment, the study area has been submerged under water as a result of a transgression. It was observed that living beings in marine environment had previously burrowed in mud of the lagoonal environment, and these burrows had been filled by the sands of the 2nd unit. In these burrows, abundant shell fragments and small gastropods with sand are recognized (Figure 4). The unit starts with pebble, coarse pebble and sand (sand ratio is small) at least in two places at the site of excavation. Regularly arranged pebbles are observed in mud which is too rare to form a layer in patches. Surface of pebbles are in white color and are composed of crystallized limestone and Miocene limestone. Their fracture surface is gray to whitish gray in color. The contact between the 1st unit and the 2nd unit is clear. Beneath this unit Late Miocene deposits are seen. These are represented by claystone and siltstones. There is also a possibility about the unit that may be the equivalent of the Kuşdili formation of Holocene age (Meriç et al., 1991). Swamp deposit is represented by mud silty mud, sandy mud, muddy sand and sand bands are observed in patches. Besides, channels are observed within the deposit. The filling material of these channels is silt, sand and pebble with muddy matrix and has a direction of N-S. These data indicate that the center of the lagoon is to the south of the study area. The pebble in channels, mostly are less rounded and poorly sorted. In some channel fills, some angular coarse pebbles also exist. Angular grains have been transported from close areas or thrown into channel by people. Over the surfaces of the pebbles in channel fills, carbonate accumulation/ coating is observed.



The lime carried in channel by water has been accumulated on pebbles which have fresh gray surface and turned their colors into white. The surface of pebbles is irregular and no any reworking are seen after transportation into the channel and coating by lime. The channels are not deep. These are flat laying channels having 3-15 cm depths. Channels filled by gravel laterally grades into pebbly sand and sand. The granular size decreases from bottom to top of the channel. Sand layers which are laterally lensoidal in marsh form wide shallow channels as well. The sand in question is usually represented by quartz grains and well sorted. Abrasion marks in mud layers at channel bottoms are distinctive but the boundary here is irregular. However, the upper boundary was detected as regular. Besides, there are silty, less muddy sands with regular lower and upper boundaries in marsh deposit. These were interpreted as sheet sands that had been deposited during flood. The thickness of the 1st unit varies between 0 to 3.5 m. Regions where the thickness



reaches 3.5 meters are observed to the east of the excavation site. The 2nd unit directly overlies the Late Miocene deposits in areas where the 1st unit does not exist. Marsh deposits are observed at eastern parts of the Yenikapı excavation site.

Coastal marshes can easily be traced at this location. The settlement area which can be observed along the coastal marshes falls into the eastern-northeastern part of the marsh (Çelik, 2007; Prof. M. Özdoğan, 2007, oral interview). Usually, Late Miocene deposits crop out at the bottom of the settlement area.

At the bottom of the marsh, 6 tree roots and part of trunks close to root section were found. However, the upper sections of trunks did not exist. As a result of the increase in water level, the contact of the lagoon along the coast has been cut off due to the development of spit and the mud began to deposit in the area. After the formation of lagoon environment, trees remained in the marsh land decayed as these were subjected to excess submersion in water. That is why only roots and trunks close to roots have been preserved. Tree branches were also recognized in some locations in the marsh land other than roots. In some places shells of bivalves were recognized in the marsh land. The shells in question are observed both as dispersed and also in the form of aggregation. It is considered that strong waves in stormy times have transported material into the marsh land from sea and shells have also been transported into the lagoon within materials.

## 2nd Unit

Flat and sub rounded pebbles and coarse pebbles of the 2nd unit overlie the unit deposited in lagoon environment (Figures 4, 5, 8). Pebbles are mostly composed of formed of recrystallized limestones and sometimes reach to a small block dimensions. The matrix among pebbles is sandy.

The burrows are observed on pebbles and coarse pebbles. This case shows that pebbles have remained in marine environment for a long time. Fossils have been preserved in many burrows (mollusc *Teredo navalis*, Prof. C. Morhange, March, 2008, oral interview). It is observed that both ends of pebbles are usually equally sized and disc shaped. This indicates the bidirectional wave action but not the unidirectional erosion of river flow. Although pebbles mentioned have been transported to the area by a river, there are distinct features showing that these pebbles have been eroded by wave actions and flattened. The total thickness of pebble layer is around 25 - 50 cm.

The unit can be divided into three sub units (2a, 2b, 2c) in some sections of the excavation site due to the presence of sand. There was observed pebble at the bottom (2a) then sand in the middle (2b) and again pebble at top (2c). The pebble sizes at the bottom reach 30 x 20 x 7 cm. However, pebble sizes located at top of the sand layer in the middle are mostly 10 x 5 x 2 cm. The ratio of both pebble layers decreases as going to the south in seaward

direction. Whereas on land, pebble at the bottom and sand layer located in the middle are pinched out and fine grained pebbly layer at the top directly overlies the 1st Unit at the bottom. The reason for pinching out of pebble at the bottom and the decrease in pebble ratio towards sea is due to the regression. The pebbly layer named as 2c disappears before 2a pebble layer on seaward and laterally grades into sand. This lateral change has developed as a result of transgression. Pebbles show a transition into sand towards open sea but overlaps with each other in landward. The shore line of the sea which caused the precipitation of the pebble layer at top might be located very near or inside the site of excavation. Since the excavation has not yet reached the area in question the accurate information will be obtained in further stages of the excavation. Mollusc burrows are observed in both pebble layers (mollusc *Teredo navalis*). Some of the smaller granules of the pebble layer at top have probably been formed by the transportation, abrasion and re-deposition of pebbles at the bottom.

It is considered that the 2nd Unit was deposited in beach environment. After the transgression that had caused the deposition of this unit the environmental conditions were deepened and the 3rd unit on top was deposited. The upper boundary of the 2nd unit is as distinct as the lower boundary.

### **3rd Unit**

There is the sandy level of the 3rd unit containing abundant sea shells with a thickness of 60 cm over the 2nd unit (Figures 2, 3, 6, 7, 8). The thickness of the 3rd unit varies between 0 – 130 cm It is observed that the 3rd unit pinches out and the 4th unit directly lies on the 2nd unit to the northeast of the site of excavation. The unit begins with a layer formed by complete shell and fragments of shell with 80% at the bottom having a thickness of 10 - 50 cm. The amount of sand in the fragmented shell layer increases upward. It is also observed that the shelly level becomes thinner and disappears in some places. There is a sand layer over it with a total thickness of 60 -70 cm. Shell layers and lenses were observed in variable thicknesses within the sandy level. The 3rd unit generally shows a fining upward sequence. Very little amount of amphora fragments were recognized within this unit. An oxidation level was observed in the upper part of the 3rd level. It might be considered that the reason of this oxidation of ferrous material in the 4th unit and stained the 3rd unit in its below.

### **4th Unit**

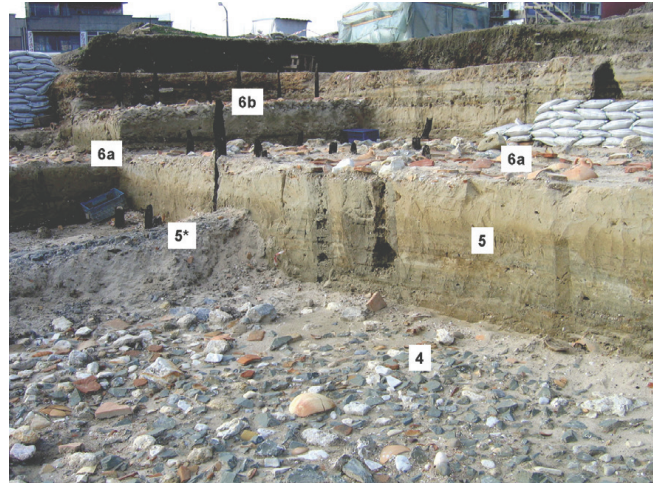
Gray colored, muddy sand and sand belonging to the 4th unit exits over the 3rd unit (Figures 2, 3, 6, 7, 8, 9, 11). Dark gray to black colored level rich in black colored organic material takes place at the base of this layer. The matrix of this coarse grained layer is



made up of mud, silt, sand and less pebble. This unit is very poorly sorted. The unit is represented by the coarse sand and muddy sand in some places. There are also detritic particules in pebble and block size. The size of some particules may even reach 1 m. An angular ceramic fragment, a tree with length of 150 cm. and a spetia type amphora in 40-50 cm in size may possibly be observed next to a marble block 1 m in length (Katalog, 2007). In addition to things mentioned above, there are also abundant shells, sometimes complete amphora and fragments of amphora, coins, metal pots, ceramic pots and fragments, fragments of kerosene lamp, rounded marbles, piece of decayed wood, fragments of glassy pots, hawser and stone anchors of ships found at this level (Pulak, 2007; Asar, 2007), pine cones, marine and terrigenous fossils, animal bones, plant pieces and leaves transported from land and kernels of different fruits (Figure 11). There was found 4 horses as completely preserved and a skeleton of camel in muddy layers of the unit (Figure 9) (Çelik, 2007; Gökçay, 2007; Perinçek et al., 2007; Perinçek, 2008). The bones of skeletons found in the site are not dispersed. The leash of one of the horses was found next to them and the feed basket of the other horse was detected next to it as transported as the horse was drifted towards sea.

### 5th Unit

Sand belonging to the 5th unit overlies the 4th unit (Figures 2, 3, 6, 7, 8, 10, 11). Minor cross bedded sand was observed in the unit. Lens shaped levels composed of shells exist toward upper layers. Besides; pieces of ceramic were also observed. The 5th unit is composed of well sorted fresh sand and its thickness changes in between 140 - 200



cm The archeological findings are not much in this unit when compared with the 4th unit at the bottom. It usually has a gradual transition with the 4th unit at the bottom but mostly has a distinct contact with the 6th unit above it. The distinct boundary indicates an important event. The 5th unit contains intercalations of sand with thin muds and lensoidal gastropod accumulations 5 mm in length. Besides, there are many shells as dispersed in the sequence. It is observed that fresh sand and very little muddy sand intercalate with each other and the bedding is markedly visible in some part of the excavation site. The transgression in the Yenikapı excavation site has begun with the 2nd unit and has continued during depositional periods of 3rd, 4th and 5th units. Relics of 5 shipwrecks were encountered at 4 different places within the 5th unit. One of the ships which it has recently been studied within this unit by archeologists was dated as 7th century (Pulak, 2007; Asal, 2007). While some of the remnants are in the form of whole vessel, some are the parts of the ship. Laminated layers have been formed just above the shipwreck by the abrasion of wood and the aggregation of the abraded material. When these dark brown surfaces were investigated it is observed that granules were originated from abraded wood. Other than the shipwreck within the unit, the wooden materials have been detected mostly parallel but sometimes with an angle to the bedding plane. It is commonly considered that wooden parts are dock piles. The reason for sinking of ships has been noted that there has been a storm affecting the shores of İstanbul (Perinçek, 2008). The 4th unit underlying the 5th unit was most probably deposited in A.D. 6th century. As for the ships found in the 6th unit that was deposited above the 5th unit were dated as 10 - 11th centuries by archeologists (Pulak, 2007; Asal, 2007; Kocabap and Kocabap, 2007; Gülbahar, 2007). Thus, it is possible to date the 5th unit between A.D. 7 – 9 centuries. There are rare

findings in ships which have been unearthed in this unit. Only in one location, many well preserved amphorae have been found close to the wrecked dock.

### **6th Unit**

This unit takes place above the 5th unit and contains many pieces of amphorae. The thickness of the 6th unit varies in between 70 - 130 cm. The sequence is generally represented by sand. Besides; it contains intercalations of clayey sand and silty sand and has a plenty of shells. Levels full of shell are laterally discontinuous. Plenty of angular ceramic pieces are observed in the 6th Unit. Sporadically rounded pebble and granules, angular to sub-rounded rock fragments, bones and ceramic levels are present in the unit. Considerably intense pieces of ceramic, almost complete amphorae are observed in three different levels in the unit. Sporadically, angular rock fragments that have been transported from shore and structures on the coast into the sea by stormy waves also exist (Figure 11, 13). Pieces of ceramic have usually been accumulated in a way that convex sides would look upward. Cross bedded sands in the form of ripple mark were observed in ceramic levels. The thickness of this sand layer varies in between 20 - 35 cm. The sand layer in some places intercalates with muddy sand and shows lamination. It is observed that the cross bedded sand sometimes contains black to dark gray colored lenses. These lenses include decayed, carbonized and disintegrated sea weed and other pieces of plant. Besides; 25 shipwrecks were found in the unit. Shipwrecks were determined as these belong to 10th century (Pulak, 2007). The macro cross bedded sand was also observed other than the micro cross bedded sand in the sequence of the 6th unit. The presence of macro cross bedding and non-muddy sand precipitated in shipwrecks were interpreted as indicators for the occurrence of storm.

### **7th Unit**

In some of the observation stations, ripple marks are observed at section where it coincides with the boundary between 6th and 7th units and in the 7th unit. The boundary of 6th and 7th units can not be detected easily. The transition of the boundary is gradational. The 7th unit is represented by sand and sporadically laminated sand (Figure 2, 3, 7, 16). Dispersed fragments of ceramic and ceramic levels, in organic material are observed sporadically. The thickness of the unit varies between 30 – 60 cm. Ceramic fragments are both angular and of some were rounded as being eroded by the wave action. It is considered that the 7th unit was deposited at the end of 11th century - beginning of 12th centuries and shows a gradational transition with the 8th unit over it in some places. The ballast stones are also present in this unit and this is another important thing that had been noticed. Rocks which were transported to the port by vessels had been dropped on port while ships were

being loaded. Lithologies of some rocks show that some of these ballast stones do not belong to Istanbul district.

### **8th Unit**

The 7th unit traverses into 8th unit which is 50- 80 m thick. The unit is mostly made up of pebble, rounded pebble, granule and lesser amount of sand. There are black colored intercalations and lenses composed of decayed and carbonized sea weeds and plant residuals. Plenty of glassy spines (sponge spicule) were encountered in these intercalations (Prof. E. Meriç, 2007, written communication; Perinçek et al., 2007). The characteristic of the 8th level (Figure 2, 3, 7, 16) is that it consists of sand and pebbles formed generally by rounded ceramic pieces. 80 to 90 % of most pebbles which were made up of ceramics have been processed by wave actions and corners are rounded. The color of the unit is red, dark gray and black; the red color originates from abraded and rounded ceramics. The said distinct key horizon is over the vessels in the 6th Unit which was dated as 10th and 11th centuries. Rounding and flattening of pebbles made up of ceramic occurred after the processes of wave erosion that had lasted for a long time following the sinking of vessels. Besides, it is considered that pieces of ceramic pots which have accidentally fallen at the port were passed through the same process in the first half of the 12th century. Most of ceramic pieces belong to the Port and can be considered that one portion of these have been carried to the Port along river.

### **9th Unit**

9th Unit made up of terrigenous soil is recognized after the 8th unit (Figure 2, 3, 7, 16). The 9th unit is represented by 1-2 meters thick cultivation soil. In the cultivated soil around the study area many architectural structures and archeological findings belonging to Late Middle Age and later have been investigated.

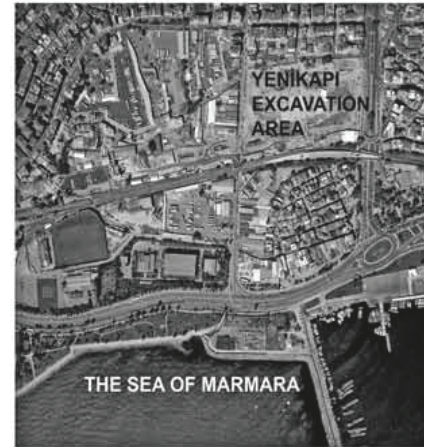
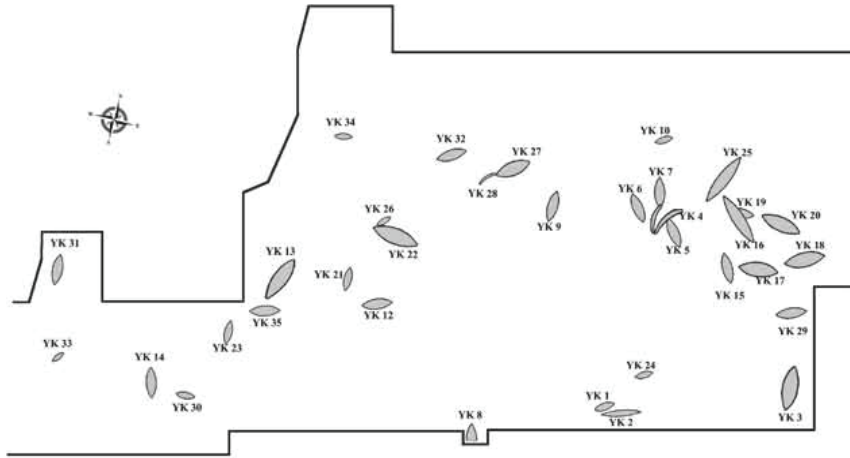
## THE YENIKAPI SHIPWRECKS

During the construction of the Marmaray railway and metro stations in Yenikapı between 2004 and 2012, no fewer than thirty-six shipwrecks, dating from the Middle Byzantine period to about the fifth to tenth centuries AD, were revealed (Figure 3). The ongoing archaeological excavations have confirmed that Constantinople's main harbour, Portus Theodosiacus, was once situated in this former natural bay, now silted by the ancient Lykos (Bayrampaşa) river and lying about 300 m from today's shoreline. The harbour is known to have been built in the late fourth century during the reign of Theodosius I (AD 376–395), in response to the demands of the growing economy and population of the capital city of the Byzantine Empire (Figure 4) (Müller-Wiener, 1998: 8). According to historical records, the breakwater of the Theodosian harbour stretched from the Davutpaşa pier on the west, first eastward and then northeast, thus protecting the bay from the prevailing southwesterly winds. Excavations by the Istanbul Archaeological Museums revealed the presence of a breakwater made of limestone blocks preserved to 25 m in length and 2.80 m in width, exposed at the west end of the construction site (Gökçay, 2007: 121).

The artefact inventory of the site is also quite rich. Different types of amphorae and table wares, coins, candles, figurines, leather sandals, ornaments, a large number of nautical artefacts – including rigging equipment such as pulleys, ropes, toggles, and also stone and iron anchors – and also well-preserved shipwrecks have been unearthed by the museum's ongoing archaeological salvage project (Kocabaş, 2010). The ships from the Theodosian harbour display a moment frozen in time and have made tremendous contributions to information on shipbuilding technology and development during Antiquity and the Middle Ages. The Istanbul Archaeological Museums turned to the Istanbul University's Department of Conservation of Marine Archaeological Objects to deal with most of the shipwrecks.1 Department President and project director Professor Ufuk Kocabaş and a hard-working team of Department assistants, full-time specialists, and Istanbul University graduate students have been working for over 5 years in the active construction site in tent-covered pits to document and carefully recover the shipwrecks (Kocabaş, 2008).2

Undoubtedly, the shipwrecks constitute the most remarkable artefact group, especially for nautical archaeologists. The thirty-four ships can be divided into three groups: long warships (galleys); sea-going traders; and small, local trading vessels. Byzantine writers named the ships *naus*, *ploion*, *xylon*, *holkas*, *karabion*, etc. But never provided any details. Coastal seafaring, mainly involving the transportation of grain, involved small sailing ships called *sandalia*, *agrario*, and *kondurai*; longdistance trade involved ships called *strongylos* and *pamphylos*; and the navy employed slim and long ships called *dromon*, *khelandion pamphyton*, and *khelandion ousiakon* (Müller-Wiener, 1998: 18; Pryor & Jeffreys, 2006: 372).

## THE GALLEYS



One of the most important achievements of the Yenikapı excavations is the discovery of galleys, rarely encountered in underwater archaeological excavations. To date, six galleys, Yenikapı (YK) 2, YK 4, YK 13, YK 16, YK 25, and YK 36, have been identified among the Yenikapı shipwrecks and four of them (YK 13, YK 16, YK 25, and YK 36) have been studied by the Istanbul University team. These galleys uncovered at Yenikapı are of great importance for they are the first archaeological examples of galleys from the Byzantine period.

### **Yenikapı 16**

The preserved length of YK 16 is 22.50 m and the width is 2.40 m. The wreck is dated to around cal AD 720–741, based on radiocarbon analyses.<sup>3</sup> The slim and long outline of the vessel and the sockets evidently meant for the oarsmen's seats (thwarts) led us to categorize this shipwreck as belonging to the galley category (Figure 5). The extant vessel comprises the keel, keelson, a short fragment thought to belong to the stem, the frame system with floor timbers and futtocks, two bilge stringers on the starboard side, two wales, and planking. No ceiling has been found.

In spite of the large number of extant planking strakes on the starboard side, they have not survived in full due to the damage in the stern direction. The frames are usually broken at the ends. The most important detail on the starboard side comprises the two thick and strong wales with a cross-section almost square in shape (around 13 by 15 cm). Between these two wales is a narrow planking strake, around 55 mm in width. The wale below is also noteworthy for its preserved length of 14.65 m. This member follows neatly the outline of the vessel's form. Another point worth noting for this wale is the grooves cut every 77–79





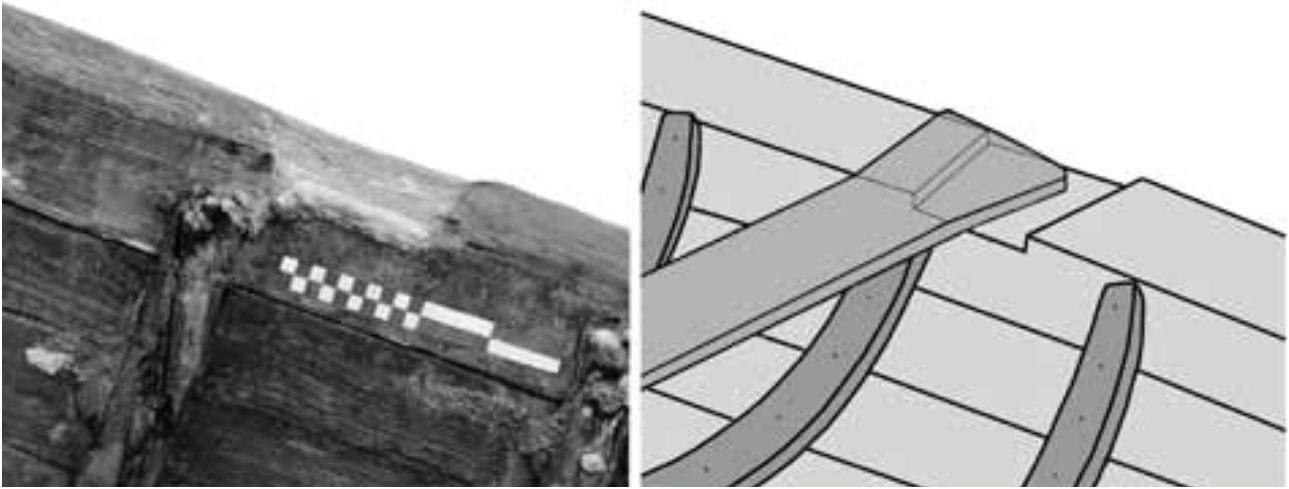
YENİKAPI 3



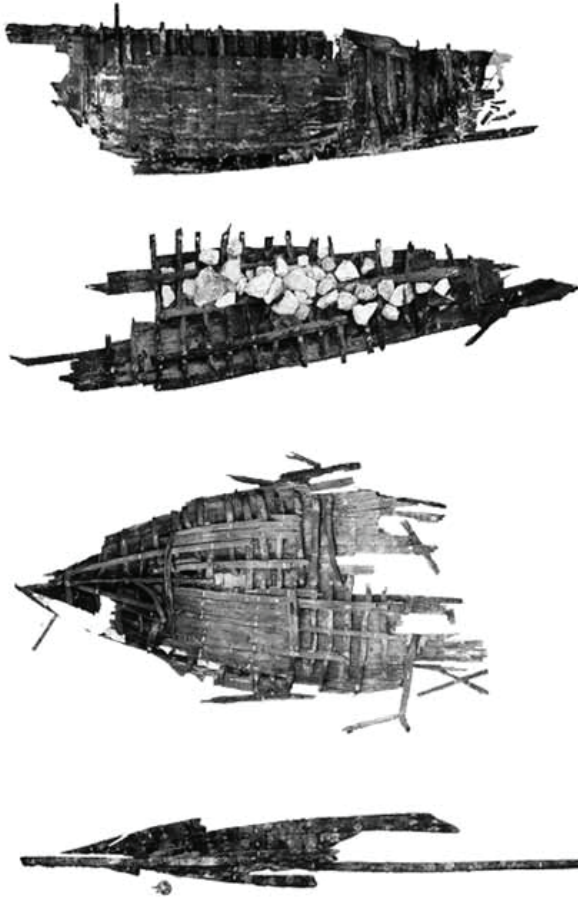
YENİKAPI 12

cm on its top side (Figure 6). These grooves are 12–13 cm wide and 15–20 mm deep. The distances between the centres of these grooves vary from 90 to 97 cm. These are thought to be the grooves for fitting the oarsmen's thwarts. About sixteen of them exist. The keel is 10 cm wide and 15.5 cm thick at the stern side but narrows down to 7 cm at the bow. The keel terminates with a scarp at the bow end and there is a second piece right on top, although out of context. This 24 cm long piece could belong to the stem. For the time being, the keel is observed as a single piece and terminates with a scarp near the stern. However, it is not clear whether this scarp joined the keel with the sternpost or a second piece of the keel. The keel and the frames bear a keelson on top. The keelson is in two pieces: the longer one is 4.76 m long, while the second piece is 1.28 m long and not in its original position. The keelson is broken at both the bow and stern ends.

The frames are very thin and fragile. Placed about 16–20 cm apart, the frames are 5 by 6 cm in cross-section. They are sequenced individually at the bow and stern ends while in the middle they are in pairs placed adjacent or very close to each other. One of these could be the futtock but as the frame ends are broken it is not possible to be certain. The frames are fastened to the planking with iron nails and dowels. Two bilge stringers stretch across



the frames. These bilge stringers were sliced from a trunk without bark and the rounded die was placed on top. The bilge stringer on the starboard side is also noteworthy for its length – a single piece which is 12.70 m long. The fact that the surface of the vessel has not yet been cleaned finely and that the surface is also coated with putty do not allow us to make any further comments on the planking. However, from what can be observed, the planking strakes have varying widths and forms. The widths vary from 6 to 18 cm and the thickness of the planks themselves is about 2 cm on average. Some fastenings were also done with scarphs. Dowels are observed between some of the planking strakes; therefore, the ship is thought to have been built with the shellbased technique. However, only after detailed examination and dismantling will we be able to obtain clear information about the shipbuilding technique and the typological features. At the time of writing, what has been identified is that this is a medieval galleytype ship of light construction, known as galea from medieval sources (Casson, 1994: 104; Pryor & Jeffreys, 2006: 423– 44). The galeae were used for watching or as a support ship for dromons, and this particular one had twenty-five oars on either side, adding up to fifty oars in total. All the ships in this group (YK 3, 8, 15, 17, 18, 19, 20, 21, and 22) are of various sizes and date from the Middle Byzantine period to about the fifth to tenth centuries AD.



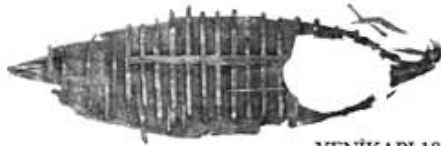
Compared to the other shipwrecks in the area, YK 3 is considered a large-sized cargo ship (Figure 5). Its extant length is 9.12 m and the width of the bottom is 2.28 m; however, its original length is estimated to be about 18 m and the width of the vessel's bottom to be about 6 m at the widest point. The shipwreck was uncovered at a  $-69$  cm level lying in a northwest– southeast direction. The cargo ship YK 3 wreck is radiocarbon dated to around cal AD 668–840.4 Numerous roof tile fragments and mortar remnants have been found inside the vessel (Figure 7). The most significant feature observed regarding the building technique of YK 3 is the strong ceiling inside the hold. The ceiling, or the interior facing, of shipwrecks from this time is rarely encountered in wreck researches conducted in the



YENİKAPI 20



YENİKAPI 9



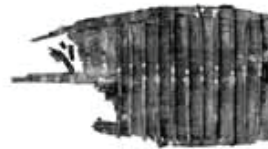
YENİKAPI 18



YENİKAPI 6



YENİKAPI 7



YENİKAPI 8



YENİKAPI 12



YENİKAPI 31

Mediterranean; however, within the Yenikapı shipwrecks we have had the opportunity to explore them in detail. In contrast to most of the shipwrecks uncovered at Yenikapı, YK 3 sank on its starboard – not on its bottom. Therefore, the portside half of the ship has entirely disappeared while the starboard side up to the first wale, including the keel, has survived. The extant members are the keel, eleven planking strakes, one wale, twenty-six floor timbers and thirteen futtocks, and eight ceiling strakes from the hold's facing; most of the wooden members have softened and become crisp and brittle. The wale especially has suffered much from teredo damage, which indicates that the wale was not buried under the sand. The garboard, i.e. the first planking strake, adjoining the keel was fastened with iron nails while the planking of the bottom was joined with wooden dowels.

The first wale identified on the starboard side was fastened on the bottom's planking with wooden dowels. However, no mark or trace of a dowel has been attested on the upper surface of the wale. The floor timbers were fastened to the keel with iron nails hammered from the interior; and the floor timbers were fastened to the planking with treenails hammered from the top and iron nails hammered from the exterior of the planking. Thus, the floor timbers were fixed with two iron nails and one treenail alternating as observed on their bottom side. The floor timbers and futtocks overlapping on the wale were fixed with iron nails. The dowel system and building technique details attested for the first time on the Yassiada shipwreck of the seventh century AD, and not clearly discernible on the Bozburun shipwreck of the ninth century, clearly suggest that YK 3 shipwreck was built with the technique of 'mixed construction'. A groove carved on frame number 19, located where the ceiling ended, closer to the stern of the vessel, is interpreted as a cabin or cellar compartment used by the captain or the crew. Parallels for it with a better-preserved upper-structure were found later on the YK 12, YK 20, and YK 29 shipwrecks.

Between the ceiling strakes and planking strakes of YK 3 were marble fragments in situ and these provide evidence for the route of the ship. It is thought that YK 3 had a connection with Marmara Island (ancient Prokonnesos), which was an important site for marble quarrying and an important harbour for ships transporting marble. The ceiling timbers of the ship are quite thick, which suggests that the cargo was heavy, and probably comprised especially construction materials such as bricks, roof tiles, and marble required for constructional activities in Istanbul.

To the last group of Byzantine ships belong Yenikapı 6, 7, 9, and 12. They are all smaller vessels used for coastal cargo shipping around the Sea of Marmara.

## **Yenikapı 12**

The YK 12 shipwreck was uncovered together with its cargo of amphorae and is the second shipwreck still containing its cargo uncovered at Yenikapı. Inside the ship were intact amphorae and many fragments belonging to such amphorae. Following the documentation and removal of the cargo, the shipwreck was exposed and the surviving part of its bottom was found to be 7 m long and 2.30 m wide. The vessel is thought to have been approximately 9.0–9.50 m long and 2.80 m wide originally (Figure 5). The shipwreck was found at a level of –1.30 m, extending in an east–west direction and it is radiocarbon dated to around cal AD 672–870.5 Yenikapı 12 was a cargo ship and it had two half decks, a single mast, and sailed with a lateen sail (Özsait-Kocabaş, 2010)

When the cargo of amphorae was removed, the ceiling was exposed. The ceiling timbers – clinkerbuilt by overlapping systematically – were fitted on the frame system with iron nails and their thicknesses vary from 5 to 12 mm. The mast step was well-preserved underneath

the cargo and it is very different from the one found on YK 6. The mast step is much longer and it can even be considered a keelson, although it does not stretch from bow to stern. In addition, it was mounted close to the centre point of the vessel – not close to the bow of the vessel as was the case with the YK 6. Beside the step to place the heel of the mast, there is a second rectangular hole, placed to the bow side of the mortise for the mast-heel. This second hole is thought to have housed the stanchion that supported the deck beam or the supporting beam on which the mast leaned. Twenty-five floor timbers and fifteen futtocks survive and were placed in a pattern. The floor timbers are sequenced with one long arm and one short arm alternating on the planking. There was a compartment, close to the stern, which contained the personal belongings of the vessel's captain. This special compartment, extending across the two spaces between three frames, has survived as a central stanchion with a groove on either side and pieces with grooves on the starboard and port futtocks. Here were found a stove-like brazier, a jug, a casserole bowl, a beaker, two small amphorae not resembling the amphorae of the cargo, and cherry stones inside a reedbasket. It is thought that the captain (magister) was also the owner of the ship. The sudden squalls at the Sea of Marmara that caused the ship to sink did not allow the captain to collect his personal belongings. Especially the cherry stones in the basket constitute an important evidence for the season when the ship sank. Cherries ripen in May and June around the Marmara; thus, this proves that the ship sank due to a summer storm and also provides information regarding the sinking of other vessels in the same sediment unit. *Teredo navalis* damage is especially noteworthy on the floor timber ends, which further indicates that the floor timber ends were not buried in sand at the bottom of the sea. The bottom of the vessel is quite wellpreserved; on top of the eight planking strakes on the starboard side were one wale and the ninth planking representing the beginning of the side-board. On the port side, seven strakes of planking have survived. All the surviving planking strakes of the shipwreck were fastened with dowels – which clearly show that the extant part of the vessel bottom was built with the shell-based method. The first wale on the starboard side is fastened to the bottom's planking with dowels.

### **Construction features**

The shipwrecks at Yenikapı studied by the Istanbul University team are grouped into two as trade ships and galleys. The trade ships are further grouped into three: as small cargo ships or fishing boats for coastal seafaring, about 8–9 m long (YK 6, YK 9, and YK 12); medium size cargo ships about 10–12 m long (YK 7, YK 18, and YK 8); and large cargo ships about 17–19 m long (YK 15, YK 16, and YK 3). As inferred from the ongoing excavations, half way between Antiquity and modern times, that is, in the Byzantine period, the traditional shell-based technique was replaced by the skeleton-based technique, which is still in use today. These are all flat-bottomed ships with rounded hulls, the latter of which implies ships designed for a greater capacity. These ships must have been used for the purpose

of transport of goods such as amphorae or construction material, as evidenced by the in situ cargoes of YK 3 and YK 12. The presence of mast steps just forward of amidships of some wrecks (YK 12 and YK 6) proved that these were sailing ships probably carrying lateen sails, as usually depicted by the artists of the age. During the disassembly process it has been observed that the edge fasteners in the form of dowels were used to join planks together and align the strakes at the bottom of all seven wrecks. Some better preserved ships in this group enrich our knowledge of construction details. The YK 18, YK 6, and YK 12 wrecks were preserved up to the couple of strakes above the first wale, which probably corresponds to the water line level or a little higher (Özsait-Kocabaş & Kocabaş, 2008). Significantly, despite the presence of dowels aligning the strakes below the first wale, there are no edge fasteners between the plank strakes recorded up to the first wale of those three ships. The features above suggest that these ships were probably built with a mixed construction technique. Once the keel, stem, and sternpost of the ships were erected, the bottom planks up to the first wale were joined together and aligned with the help of edge fasteners, and the frames were installed afterwards. The planks without edge fasteners above the first wale were nailed to futtocks after this process. In other words, while the bottoms of the ships were joined in a shell-based design, the remaining hull was built in a skeletonbased design. Consequently, this mixed technique of construction may suggest a transitional understanding of shipbuilding from the shell-based to the skeleton-based design, which has been a long lasting subject of theoretical discussions in nautical archaeology. At this stage of the project it is more convenient to wait for future research for precise assessments.







04 PROJECT : ARCHAEOLOGY MUSEUM



## MOTIVAZIONI

Le motivazioni della scelta che hanno portato a sviluppare il progetto di tesi a Istanbul e la selezione dell'area in cui si è operato sono la mia personale provenienza dalla Turchia, in particolare da questa stessa città. Lo svolgimento inoltre di un workshop relativo all'elaborazione di un possibile progetto sull'area antistante la stazione di Yenikapı, sede di recenti scavi archeologici che hanno portato alla luce testimonianze di epoca neolitica, romana e bizantina, ha dato avvio allo studio del progetto di tesi.

## MOTIVATIONS

The motivations of the choice that made possible developing the thesis project in Istanbul and the selection of the area that took place are my personal providence in Turkey, particularly the same city. The progress other than a workshop related to elaboration of a possible project about the area in front of the station of Yenikapı, the place of the recent archeological excavations that brought into day light the evidence of Neolithic age, Romanian and byzantine, gave start to study of the thesis project.

## CARATTERISTICHE DELL'AREA

Il sito è attualmente caratterizzato da una profonda metamorfosi, in quanto la stazione di Yenikapı, collocata a sud dell'area, è punto di collegamento fondamentale all'interno del progetto Marmaray, il piano di trasporto ferroviario che prevede la costruzione di un tunnel sottomarino nello Stretto del Bosforo e la modernizzazione delle linee ferroviarie suburbane lungo il Mar di Marmara, compresa appunto la Stazione di Yenikapı.

Altro aspetto sostanziale è la presenza nel lotto di testimonianze storiche e culturali, costituite da un antico villaggio armeno affacciato sul mare e limitato dalla strada costiera e da un vastissimo scavo archeologico, che ha recentemente portato alla luce un porto di epoca romana, una chiesa bizantina e numerosi reperti, tra cui molteplici relitti di navi.

In quest'area si assiste quindi alla compresenza della città moderna e di quella storica: da una parte la Stazione di Yenikapı e il progetto per un futuro collegamento sottomarino che faciliterà i collegamenti tra le due parti della città, dall'altra la fotografia della città storica, quando il porto e il livello del mare erano collocati a ridosso dell'attuale stazione.

## THE CHARACTERISTICS OF AREA

The site is actually characterized by a profound metamorphosis, in as much the station of Yenikapı, connected to the south of the area, is the point of fundamental connection at the inside of Marmaray Project, the railway transport floor/level/plane that foresee the construction of a underwater tunnel in the Bosphorus strait and the modernization of the suburban railway lines along the Marmara Sea, compresses till the Station of Yenikapı.

Another substantial aspect is the presence in site of historical and cultural evidences, constituted from an antique Armenian village facing the sea and limited from the coast and from a really vast archeological excavation that recently brought into the light a port from Roman Age, a Byzantine church and numerous findings, among them multiple shipwrecks.

In this area therefore there are presence of both the modern and the historical city: from one point of view the Station of Yenikapı and the project for a future connection from under water which will facilitate the connections between two parts of the city, and from other point of view the photography of the historical city, when the port and the level of the sea were established behind the actual station.

## SCAVI

Gli archeologi hanno rinvenuto nel sottosuolo l'antico porto di Bisanzio, insediamenti e cimiteri risalenti all'epoca neolitica, scoprendo così che la città è più vecchia di 8.000 anni rispetto a quanto si pensasse in precedenza. Sono state infatti scoperte numerose urne di cremazione del periodo Neolitico e una tomba con gli scheletri di due adulti e due bambini in posizione rannicchiata, comprensive di effetti personali quali abbigliamento, gioielli e utensili. Sono stati inoltre trovati resti di un primo insediamento con reperti di case costruite con alberi e rami.

L'archeologo e professore associato Necmi Karul afferma che il sito è un terreno di sepoltura risalente al 5.800-6.000 a.C., l'ultimo del Neolitico o Età della Pietra, un periodo chiave nello sviluppo delle tecnologie umane iniziato circa nel 10.000 a.C. nel Medio Oriente.

Per tutte queste ragioni Yenikapı è importante per la storia della città di İstanbul e per il suo sviluppo futuro.

## EXCAVATIONS

The archeologists discovered in the subsoil the antique Byzantine port, settlements and graveyards going back to the Neolithic age, so it is discovered that the city is actually 8.000 years older than it's thought to be before. There are also found numerous cremation boxes from the Neolithic age and one tomb with the skeletons of two adults and two children cuddling, inclusive of personal effects as clothes, jewellery and tools. There were also other explorations like the rests from a primary settlement with findings of houses made from trees and branches.

The archeologist and associate professor Necmi Karul affirm that the site is a ground of sepulture regarding to 5.800-6.000 b.C., the last of Neolithic and Stone age, a key age regarding the human technologic development beginning about 10.000 b.C. in Medium Orient.

For all of these regions Yenikapı is important for the story of the Istanbul city and for its development in the future.

## **OBIETTIVO**

La tesi prevede il ripensamento dell'area antistante la Stazione di Yenikapı attraverso il progetto degli spazi pubblici esterni, la creazione di un museo ipogeo che racconta la storia di Istanbul mediante i reperti ritrovati in questa stessa area e l'inserimento di una torre come landmark, che racchiude al proprio interno spazi museali dedicati all'esposizione contemporanea.

L'obiettivo è quindi legare l'infrastruttura ora presente con la città antica, mettendo in evidenza il valore degli scavi e dei reperti, che continuano ad essere ritrovati e studiati; collegare il porto antico con la nuova stazione, di modo che gli utenti di passaggio possano sostare per scoprire il valore di questi spazi. Il continuo flusso di viaggiatori all'interno della stazione accresce possibilmente il numero di visitatori all'interno del museo.

Il progetto diviene potenziale passaggio, filtro per l'uscita sulla città e luogo di transizione oppure, in alternativa, possibilità per vivere la stazione e il museo in maniera separata.

Il museo si pone come una potenzialità in più, dato poi che l'attuale immagine della stazione e dell'area antistante si trovano in condizioni discutibili e non certo di attrattiva per i turisti.

## **OBJECTIVE**

The thesis foresees rethinking the area that is in front of the Yenikapı Station through the project of external public spaces, the creation of a hypogeal museum that tells the story of Istanbul through the rediscovered findings at the same area and the insertion of a tower like landmark, that contain its own internal spaces dedicated to contemporary exhibition.

Therefore the objective is binding presently existing infrastructure with the antique city, putting in evidence the value of excavations and findings, which continue to get rediscovered and studied; the purpose is connecting the antique port with the new station, so as the users of the passage can have a break to find out the value of these spaces. The continuous flow of travelers to the station's inside increase possibly the number of visitors at the inside of the museum.

The project becomes potential passage, filter for the way out from the city and the place of transition or, alternatively, the possibility for living the station and the museum in a divided manner.

The museum is like a farther potentiality, given later that the actual image of the station and the area in front are in discussible conditions and for sure not attractive for the tourists.

## PROGETTO / PROJECT

### Spazi esterni

Il disegno degli spazi esterni, e in particolar modo della piazza verde al di sotto della quale trova luogo il museo archeologico, è descritto secondo una pavimentazione di trama 5m x 5m, che vuole ricordare l'elemento rigido del preesistente e, allo stesso tempo, la suddivisione dei tracciati di riferimento del rilievo archeologico qui operato.

Lo spazio che si sviluppa attorno alla stazione, al museo e alla torre, sul versante sud-ovest, è stato concepito come un parco archeologico. Il parco è caratterizzato dalla presenza di alcuni percorsi che accompagnano alla visita di scavi a cielo aperto, in modo tale che l'area archeologica sia visitabile non solo internamente al museo, ma servita anche da percorsi urbani di collegamento tra la città edificata, la stazione, l'area archeologica e il museo.

Se da un lato il disegno dello spazio pubblico antistante la stazione e il museo è scandito da un disegno rigoroso e regolare della pavimentazione, dei percorsi e della piazza verde, dall'altro, il parco archeologico segue linee più sinuose e naturali.

I percorsi pedonali sono organizzati secondo due tipologie: sono presenti delle vie urbane che collegano da nord a sud e da est a ovest la città intersecate a dei percorsi costituiti da listelli di legno che simulano degli antichi moli e che mettono in relazione il museo con gli scavi archeologici esterni.

Fondamentale nel disegno dei percorsi pedonali è la forte presenza dei resti delle antiche mura della città, risalenti all'età bizantina. Alla base di queste è stato concepito un bacino d'acqua, a ricordo del livello del mare, che nel 400 d.C. occupava l'area su cui sorge la stazione e il museo.

La sistemazione dello spazio pubblico esterno mira dunque a divenire un luogo vissuto della città, usufruito dai turisti e dagli abitanti della zona, a differenza di come si presenta la situazione attuale.

### Outdoor spaces

The design of external spaces, and in a particular way of the green square that is under of the place where is the archeological museum, is described according to a grid of archeological excavations 5m x 5m, that needs remembering the rigid element of preexistent and, at the same time, the suddivision of layouts of concern of archeological relief here operated.

The space that developed near by the station, the museum and the tower, at south-west side, conceived as an archeological park. The park is characterized from the presence of some routes that lead to the visit of excavations in open air; like that the archeological

area can be visited not only at the inside of the museum, but also served from urban routes of connections between the city edified, the station, the archeological area and the museum.

If from one side the design of the public space in front of the station and the museum is articulated from a rigorous design and regular paving, routes and green square, from other side, the archeological park follows more sinuous and natural lines.

The pedestrian routes are organized according to two typologies: there are some urban streets that connect north to south and east to west; the city is intersected in routes constituted from wooden laths that simulate antique masses and that putting in relation the museum with the archeological external excavations.

Fundamental in design of pedestrian routes is the strong presence of antique walls' rests of the city, went back to Byzantine age. At the base of these, it is conceived a basin of water, a memory of the level of the sea, that in 400 a.C. was occupying the area on it arising the station and the museum.

Therefore the arrangement of public external space aim to become a place lived of the city, benefited by the tourists and from inhabitants of the zone, with the difference of how the actual situation is being presented.

## **Il museo**

La struttura museale trova uno sviluppo ipogeo in modo tale da richiamare gli scavi che per mesi hanno interessato quest'area e da coinvolgere il visitatore creando un percorso museale più suggestivo.

L'accesso al museo avviene da Corso Mustafa Kemal, attraverso una scalinata monumentale, che gradualmente accompagna all'ingresso e che descrive una prospettiva verso la torre landmark. La scalinata, di dimensioni rilevanti, è in proporzione con gli estesi spazi interni del museo e si presta ad essere vissuta come spazio urbano di sosta non esclusivamente per i visitatori. Infatti la scalinata d'accesso al museo è anche mezzo di collegamento tra la stazione sotterranea di Yenikapı e la città sovrastante. Sul lato opposto trovano luogo altri due accessi, che permettono di accedere agli archivi, alla biblioteca e ai laboratori a quota -7 m e alla torre.

Il museo è sviluppato su due piani interrati, di sette metri di altezza ciascuno, in modo tale che il solaio del piano inferiore corrisponde alla quota del terreno in cui sono stati eseguiti gli scavi archeologici. Il primo piano interrato è caratterizzato da un'apertura sul livello sottostante, che permette quindi una vista continua sui reperti delle barche collocate sulla pavimentazione alla base dell'edificio. In corrispondenza di questo spazio a doppia altezza sono stati collocati i lucernai, visibili dalla piazza verde a quota zero.

La biglietteria è collocata al piano primo interrato e da questa, si accede alle scale e

ai vani ascensori, che accompagnano al livello sottostante, dove ha inizio il percorso museale. A sinistra della biglietteria, trovano spazio il book shop, la sala multimediale, fornita di apparecchi digitali per una vista virtuale, la biblioteca e l'archivio. A destra della biglietteria sono collocati il bar, il guardaroba, la sala conferenze con 450 posti a sedere, i laboratori di ricerca e gli uffici.

Al livello sottostante, il secondo piano interrato, il percorso museale si articola attraverso delle passerelle da cui si visitano i reperti delle barche di epoca bizantina. Questi percorsi in legno per disegno, dimensioni e materiali impiegati rimandano ai moli dei porti. Sul lato lungo opposto sono distribuite le sale di esposizione, che si susseguono cronologicamente: le prime ospitano gli scheletri in posizione hocker risalenti all'epoca neolitica, segue una sala con altri reperti di epoca neolitica, inseriti in un allestimento costituito da rami e legni, che creano una scenografia da foresta. Sono disposte poi le sale con le suppellettili di epoca bizantina e tardo bizantina. Uno spazio tra di queste è adibito alla proiezione di filmati a supporto del percorso. Seguono poi nell'esposizione i reperti di epoca ottomana. Nella parte retrostante alle sale di esposizione sono disposti i depositi, suddivisi a seconda della climatizzazione richiesta dai vari tipi di reperti, e i locali tecnici. Da questo livello si accede poi unicamente alla base della torre, dove si trovano i resti della Chiesa Bizantina, posti nella loro originale collocazione.

### **The museum**

The structure of the museum finds a hypogeal development like recalling the excavations that for months they were interested in this area and to involve the visitor by creating a museal route more suggestive.

The access to the museum occurs from Mustafa Kemal Path, through little monumental stairs, that gradually accompany to the entrance and that describe a prospective towards the tower landmark. The stairs, relevant dimensions, is in proportion with the broad internal spaces of the museum and offers to be seen as an urban space of a break not exclusively for the visitors. Infact the stairs at the entrance of the museum is also a mean of connection between the subterranean station of Yenikapı and the rest of the city. At the opposite side there are other two accesses that permit entering into the archives, the library and the laboratories at -7m height and to the tower.

The museum is developed on two levels each one is seven meters high, like that the attic of the inferior plane corresponds to the quota/height of the ground where the archeological excavations are carried out/done/fulfilled. The first plane is characterized by an aperture on the underlying level that permits hence a view continuous on findings of the shipwrecks placed on the flooring/paving of the building's base. Correspondently of this space at duplicated height skylights are placed, visible from the square at a zero level.

The entrance is placed at first level interrato and from that, accede to the stairs and to



the vain elevators, that accompany to the subterranean plane, where the museum route is started. At the left of the box office there are space book shop, the multimedial space, furnished from digital sets for a virtual view, the library and the archive. At the right of the box office there are placed a bar, a wardrobe, a conference room with 450 seats, research labs and the offices.

At underlying plane, the second level, the museum route is divided through the footbridges from where can be visited the findings of the boats from the Byzantine age. These routes in wood for design, dimensions and materials used sending back to the masses of the ports. At the long opposite side exposition rooms are distributed that follow chronologically: the firsts accommodate the skeletons in hocker position regarding to Neolithic age, follows a room with other findings of Neolithic age, inserted in a preparation constituted from branches and woods, that create a scenography/scenery of a forest. Then there are rooms disposed with furnishings from byzantine age and late byzantine age. A space between these is used for the projection of videos to support the route. Then in the exposition it is followed by the findings of the ottoman age. At the other part of the exposition rooms disposed deposits, divided according to the air conditioning needed by various types of the findings, and technical locals. From this plane accede after uniquely to the base of the tower, where are the findings of the Byzantine Church, placed in their original collocation.

### **Le caratteristiche architettoniche**

La volontà progettuale di lavorare prevalentemente in ipogeo ha, come già accennato, il duplice obbiettivo di porre l'intervento in continuità con le infrastrutture di mobilità e di richiamare l'idea dello scavo archeologico come strumento per la riscoperta delle origini della città. Questo diviene un elemento fortemente vincolante per la progettazione di uno spazio pubblico museale, che deve necessariamente cercare soluzioni architettoniche adeguate alla sua funzione e al flusso di visitatori.

In quest'ottica l'edificio è stato pensato attorno ad una grande "corte" a doppia altezza, libera da strutture verticali interne in modo da far filtrare la luce naturale fino al livello più basso. Lo sviluppo in altezza e le grandi scalinate liberano la percezione dall'oppressione dell'ipogeo, e danno respiro al piano espositivo inferiore, la cui pavimentazione a passerelle lignee richiama gli spazi all'aperto dell'antico porto. I materiali che sono stati impiegati per la pavimentazione sono infatti listelli di legno per i percorsi attorno agli scavi; resina nelle sale di esposizione che, essendo un materiale più contemporaneo, lascia trasparire l'utilizzo come sala multimediale e rende questi spazi il più possibile flessibili riguardo un ipotetico cambio di funzioni future. Negli spazi più lavorativi e che prevedono una sosta all'interno di questi è stato impiegato il parquet, per dare una sensazione più accogliente e piacevole.

L'utilizzo esteso del vetro vuole essere un ulteriore strumento per dare luminosità e per lasciare libero lo sguardo del visitatore, offrendo la visuale completa anche dagli ascensori. Sempre relativamente agli impianti di collegamento verticali, la scala che mette in comunicazione i due livelli interrati è realizzata con una struttura in acciaio e intervallata da sedute realizzate con un rivestimento di legno posto sopra i gradini, che consentono di avere una vista sugli scavi sottostanti. L'articolazione della scala consente inoltre di creare un ulteriore vuoto, al di sotto del quale sono visibili i resti archeologici.

Relativamente alle sale di esposizione, gli ambienti che ospitano i reperti di epoca neolitica si distaccano maggiormente dalle altre sale: l'allestimento delle tombe degli scheletri segue linee sinuose, date dalla posizione hoker dei corpi, in tal modo l'ambiente ricavato risulta essere più suggestivo e sottolineare l'unicità e l'importanza di questi reperti rispetto al resto della collezione. La sala successiva, ospitante resti di rami e vegetali, ricrea invece l'ambiente di una foresta attraverso l'impiego di bambù e ulteriori elementi lignei, che danno uno slancio in verticalità dello spazio.

Le altre sale espositive hanno un disegno più usuale e regolare, in quanto ospitano dei reperti più consueti ai musei archeologici, come busti e suppellettili varie. Le teche di esposizione di questi ambienti sono in ferro brunito, accostato a dettagli in legno in tonalità chiare, che creano una combinazione di materiali freddi e caldi.

Al livello superiore sono state concepite delle stanze adibite ad una visita multimediale, che permettono di rendere più dinamica e meno consueta la visita coinvolgendo in prima persona i visitatori e che, allo stesso tempo, permettono di offrire una visione più realistica e più comunicativa del periodo analizzato. Sono stati quindi installati degli schermi touch, pannelli con proiezioni di filmati e video, programmi virtuali di simulazione, previsti sia su banchi che su pavimentazione e pareti verticali.





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