

NARBO —
— VIA

STOPOVER IN THE ROMAN MEDITERRANEAN

FROM 13/06/24
TO 05/01/25

THE ANCIENTS PORTS OF NARBONNE

© F. Hédelin

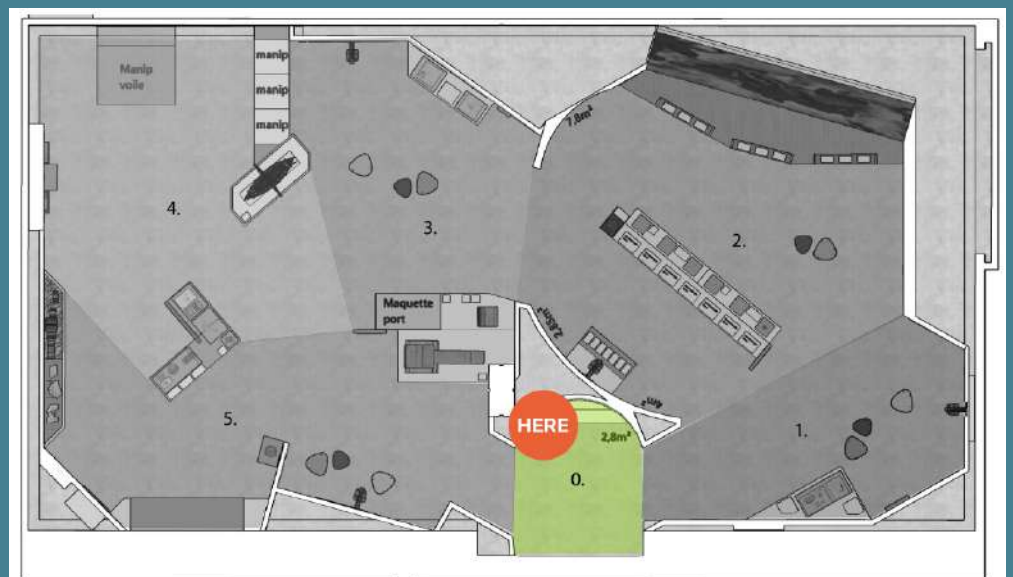


It is to you [Narbonne] that the seas of the East and the ocean of the Iberians pour their merchandise and their treasures; it is for you that the fleets sail on the waters of Libya and Sicily: and all the laden vessels that travel in all directions along the rivers and seas, everything that sails in the whole universe comes to land on your shores.

Ausonius, 4th century poet



To find your way around the exhibition:



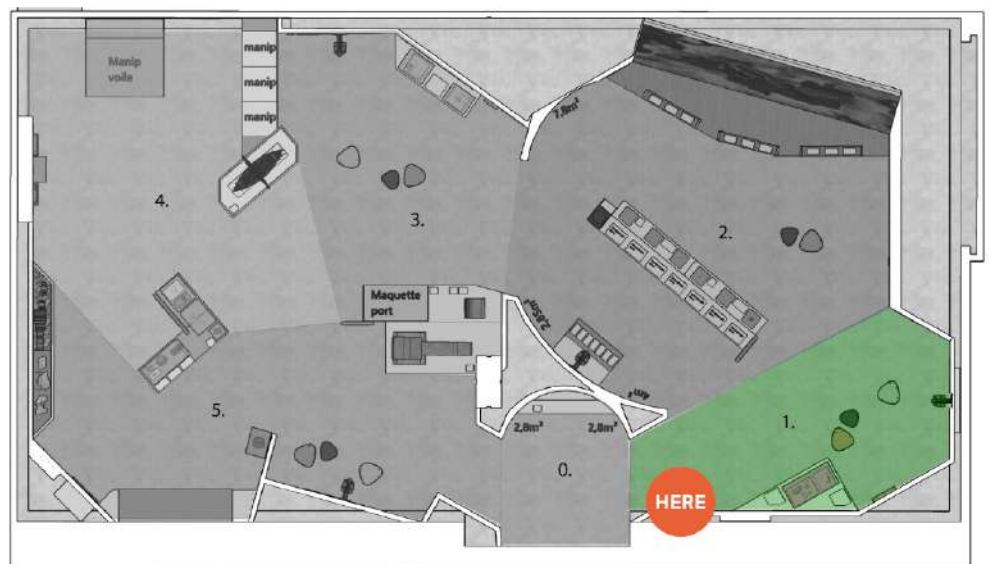


NARBONNE AND ITS LAGOONS

The port of Narbonne (*Narbo Martius*) was built in a changing and restrictive natural environment, consisting of a river, the Aude, which flows into a lagoon accessible from the sea via channels.

The topography of this area has changed considerably since ancient times, but it has been reconstructed thanks to the work of researchers. Although this windswept territory may seem hostile in many respects, it also has many assets (fishing, shellfish, salt farming) that were developed and used at an early date.

Even before the Roman colony was founded in 118 BC, the inhabitants of this area were already trading with merchants from various regions of Gaul and the Mediterranean: Greeks, Etruscans, Iberians and Celts. These commercial exchanges took place in coastal trading posts whose port facilities remain poorly understood. However, their activity is well attested by the merchandise that has been found from far-off origins, testifying to the strategic position of this region in the Mediterranean even before Roman settlement.



COASTAL SETTLEMENTS AND RESOURCES

Protohistoric coastal settlements

Long before the founding of the Roman colony of Narbonne, the mouth of the River Aude played an essential role as a place of early contact between the Celtic world and the civilisations established around the Mediterranean basin.

In the 7th century BC, the Phoenicians, who settled in Andalusia since at least the 9th century BC, reached as far as the Aude region, while - prior to the founding of Marseille by the Phocaeans (around 600 BC) - Greek sailors also ventured as far as the shores of the Gulf of Lion.

At that time, although these contacts were regular, they were nonetheless episodic, and no site on the Narbonne coast was to have acted as a «port».

The situation changed considerably during the 6th century BC. With the founding of Marseille (Massalia) in Provence and Empúries (Emporion) in Catalonia, new trade routes were established.

At the same time, a dense network of fortified settlements developed in southern Gaul. Close to the coast, the oppidum of Montlaurès (Narbonne) was clearly one of these major sites, occupying a strategic position not far from the mouth of the river Aude. Around the Narbonne lagoon, referred to as the Lacus rubrensis by a number of Latin authors, a number of sites appeared which, to varying degrees, served as ports: Pech Maho (Sigean), La Moulinasse (Salles-d'Aude), both founded in the 6th century BC, then Le Moulin (Peyriac-de-Mer), founded in the 4th century BC.



Phoenician urn,
necropolis Agredo in Roquefort-des-
Corbières (7th century BC)
©L.Damelet, CNRS-CCJ



Map of the main coastal sites around the Narbonnais ponds in protohistoric and Roman times. The town of Narbonne is 12 km from the sea, but is linked to the lakes by the river, which at that time passed to the west of the Clape massif.
©J.Cavero, CNRS

The founding of Narbonne

From the founding of the Roman colony of *Narbo Martius*, on the banks of the river Atax, in 118 BC, trade with Italy took on considerable importance. The ships carrying Italian wine were imposing vessels that could be up to forty metres long. Their absence from the Languedoc coast suggests that they could have sailed directly from the ports on the Tyrrhenian coast to Empúries, where there was a deep anchorage at the time. It is assumed that the Italian amphorae were then transported to Narbonne in smaller boats and from there continued their journey by land to the ocean.



Italic wine amphora, discovered in Narbonne, 2nd-1st century B.C.
©A. Späni, Narbo Via

Iberian cylindrical vase, discovered in Narbonne, 2nd-1st century B.C.
©A. Späni, Narbo Via



Exploitation of the environment and the coastal economy

The many known coastal sites around the Narbonne lagoon reflect both the exploitation of the environment and the potential of the port. The most emblematic example is the island of Sainte-Lucie: its bay, long considered to be Narbonne's main port, turned out to be too shallow to accommodate large tonnage vessels. However, there were landing stages accessible to barges that could get as close as possible to the limestone quarries needed to build the town. The function of many coastal sites remains open to debate, particularly in relation to the exploitation of the lagoon and maritime environment, which was a resource for the inhabitants of the Narbonne region.

These resources can also fuel extra-regional trade. Narbonne's oysters, for example, enjoyed such a reputation that they were shipped to other towns in Gaul. Although it has left no archaeological traces, the cultivation of salt, a necessary commodity for food preservation, must have been an important economic activity.

Agricultural estates such as the villae contributed to this economy, as they were able to sell their surplus produce thanks to the proximity of the sea. The fishpond at Port-la-Nautique, with its pool and dining room, is an exceptional example of fish farming in a luxurious setting. dor, es un ejemplo excepcional de piscicultura en un entorno de lujo.

PEOPLE INVOLVED IN THE KNOWLEDGE OF THE KNOWLEDGE OF THE NATURAL ENVIRONMENT

Geophysical surveys have been used extensively to locate archaeological remains and the ancient course of the River Aude. Measuring instruments moved over the surface of the ground allow structures to be identified in the form of results maps, the colours of which reflect the intensity of the geophysical signal. We can then deduce the nature of the materials present in the first few metres of soil, and therefore the presence or otherwise of archaeological structures.



Geophysical prospecting using a magnetometer on Mandirac ©C. Sanchez, Chrs



Sediment coring in marshy terrain at Port-la-Nautique ©C. Sanchez, Chrs

Sediment coring completes these observations. In the laboratory, sediments and their fossil contents are analysed to identify the different environments that succeeded each other: marine, lagoon, estuarine and fluvial. The organic remains - sediment, peat, wood, charcoal - and shells found are analysed and dated. Research has also shown that the water level in the lagoon oscillated between 0.2 and 0.6 m below the current level.

Ostracods, small crustaceans less than 2 mm in size and highly sensitive to changes in salinity, are also used as tracers of hydrological conditions, making it possible to identify the proximity of embouchures, the connection to the marine environment and the closure of lagoons (establishment of barrier beaches).



Sediment sieving to collect seeds, charcoal and microremains ©D. Remeau, Ippo Facto

Carpology (the study of plant remains), palynology (the study of pollen), xylology (the study of wood) and anthracology (the study of charcoal) are disciplines that enable us to reconstruct the plant landscape and thus describe the evolution of environments, resources and their exploitation. We have been able to establish that a mixed oak and holm oak forest developed on the land surrounding the lagoon. The identification of numerous seed and fruit remains also revealed the presence of marshes and swamps made up of rushes and numerous aquatic plants.

The landscapes of the Narbonne lagoon are constantly changing. In this environment between land and water, the contours of the lagoon and the course of the river Aude (formerly Atax) have varied under the influence of environmental changes and human activities.

Interdisciplinary approaches, combining palaeo-environmental studies, archaeology and historical sources, enable us to trace these changes and their impact on the function of Narbonne's port system and its environment.

The study of old maps and aerial photographs, the acquisition of topographical data using various detection techniques, and more particularly extensive geophysical surveys combined with sedimentary coring, are being used to understand the evolution of past environments and discover archaeological structures.

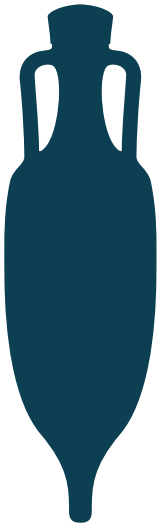
In ancient times, the Roman colony was linked by the ancient course of the River Aude to a vast lagoon complex covering more than 8,000 hectares (6,000 hectares today) which opens to the sea.

The location of the shipwrecks at Port-la-Nouvelle and Gruissan means that the barrier beach can be traced back 1.5 kilometres to the present-day coastline. Today, the Narbonne lagoons are separated from the sea by a sandy barrier beach pierced by three graus, Port-la-Nouvelle, Vieille-Nouvelle and Gruissan, which provide access to the lagoon. Two concentrations of shipwrecks, at Port-la-Nouvelle and to the north at Gruissan, behind the current barrier, suggest that this barrier may have migrated.

Two concentrations of wrecks at Port-la-Nouvelle and to the north at Gruissan, behind the present barrier beach, suggest the possible migration of this strand.



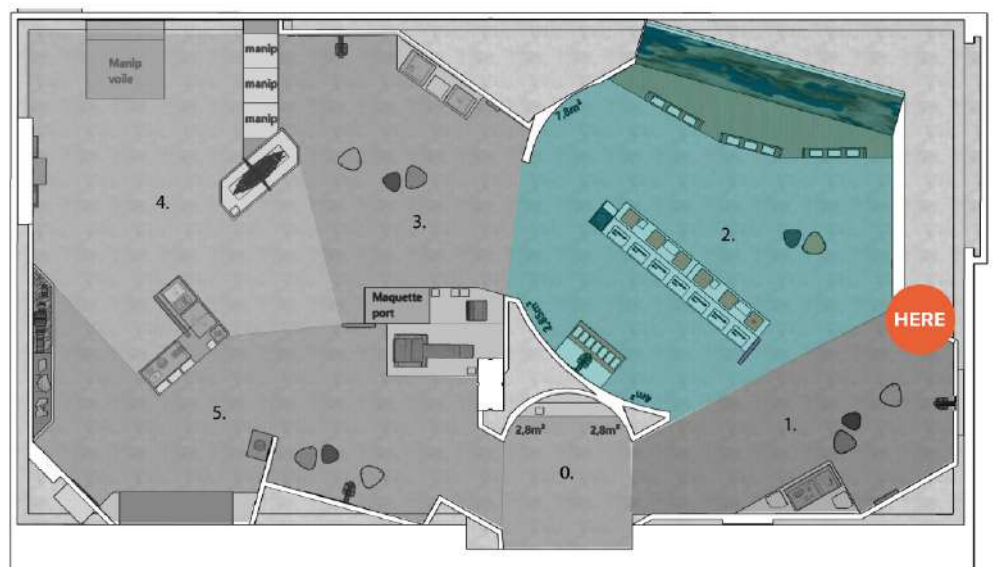
Antique map of Narbonne and its ponds, detail from a map of the Languedoc coast, anonymous, early 18th century, Voies Navigables de France archive



AT THE HEART OF *MARE NOSTRUM*

The capital of the province of Narbonese Gaul, *Narbo Martius* was also a major Mediterranean port: a considerable flow of goods from all over the Roman Empire, as well as local products, passed through its quays.

Ancient writers such as the Greek geographer Strabo refer to it as «the port of the entire Celtic region», and countless amphorae and foodstuffs of various origins have been found in and around the town. The port was part of a dense and complex network of trade routes that evolved over time as the Roman Empire expanded and its provinces developed. This trade led to the first form of «globalisation» on the scale of the Empire. The routes taken were identified thanks to the ships that travelled them and, more specifically, the wrecks that were found with their cargoes. These wrecks are a prime source of information and have contributed greatly to renewing our knowledge of Roman maritime trade.



TOTEM: MAJOR TRADE ROUTES IN THE ROMAN MEDITERRANEAN

At the crossroads of the routes linking Italy to Spain and the Mediterranean to the Atlantic, Narbonne was a major interface in the western Mediterranean, where flows of goods converged that can be broadly characterised as follows: from the 2nd century BC, Italian wines flooded Gaul, which was still independent, largely via Narbonne.

At the same time, tin from Great Britain, essential for the manufacture of bronze, reached *Narbo Martius* via the Atlantic and the Aude/Garonne axis.

With the conquest of Hispania and Gaul, and the expansion of the Empire, trade patterns changed: the origins and contents of amphorae diversified.

From the middle of the 1st century BC, wine from Tarracon (now Catalonia) replaced Italian wine in smaller quantities. Then oil and garum (fish sauce), as well as lead and copper from Betica began to arrive in Narbonne, before being shipped back to Gaul and Rome.

A few decades later, *Narbo Martius* became the port of export for products from western Narbonese Gaul: sigillated ceramics produced on a massive scale in Millau (Aveyron); wine, production of which increased significantly until the 2nd century and was exported throughout the Roman world and beyond, thanks in particular to the Gaulish amphora 4; iron mined in the Montagne Noire, the high Corbières and Canigou.



Gaulish flat-bottomed wine amphorae (type Gauloise 4), discovered at the Clots de Raynaud site in Sallèles-d'Aude (Amphoralis), 1st - 2nd century, Musée Amphoralis © A. Späni , Narbo Via

In the 2nd century AD, oil, garum and olive production developed in Proconsular Africa (now Tunisia and eastern Algeria) and reached the Empire's markets, alongside Hispanic production, which remained abundant.

TOTEM OTHER SIDE: THE ARCHAEOLOGY OF SHIPWRECKS TO HELP US UNDERSTAND ROMAN TRADE

How were the ancient trade routes identified? The study of ancient texts provided a first, very incomplete level of knowledge. Then, with the development of modern archaeology, the study of objects (mainly amphorae and ceramics) discovered in very large quantities at the places where they were consumed made it possible to gradually reconstruct these routes. But these data give only a partial view of reality: everything that was transported in containers made of organic materials (wooden crates, sacks, etc.), as well as living beings (slaves, animals), left no trace and have largely escaped us.

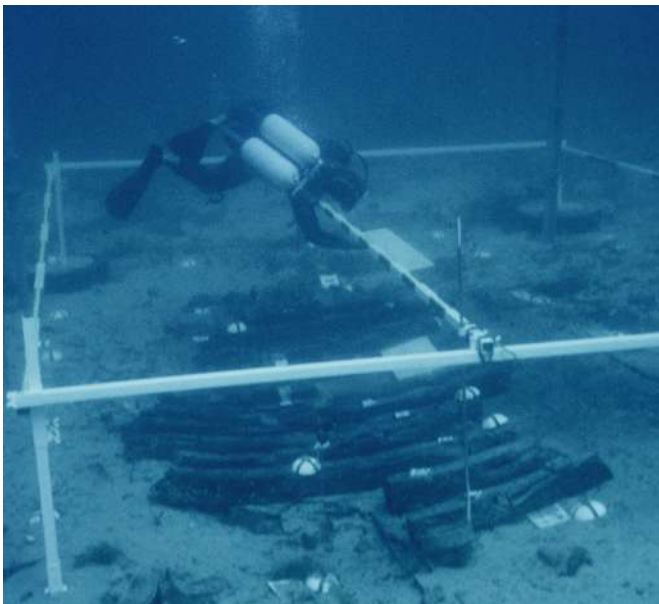
In this context, the wreck is a very valuable source of information, even if the boat itself is often poorly preserved (wood and ropes are the first to be destroyed by wood-eating insects).

As far as knowledge of trade is concerned, the wreck is a kind of time capsule, a snapshot of a transport operation that was brought to an abrupt halt by the shipwreck. As far as the cargo is concerned, while the places where the goods were produced are known, the place or places where they were loaded onto the ship are more difficult to identify, given the commercial logic that prevails in this field: goods may be stored for a time in a port-warehouse before being shipped on in smaller quantities. In order to find this information, all sorts of criteria need to be taken into account: the date of the shipwreck, the size of the vessel, the combination of different goods, the organisation of the cargo, and so on.



Over the last twenty years or so, deep-sea exploration has developed thanks to sophisticated tools such as underwater robots, opening up new research perspectives. It has extended the list of known shipwrecks, but their exploration is often limited to simple observation.

Wreck of the Madrague de Giens port under excavation. © A. Chêne, CNRS, CCJ, Aix-en-Provence



As in the terrestrial environment, stratigraphy (the study of different sedimentary inputs) is an important concept, particularly in the case of shipwrecks, where it is possible to reconstruct the position of the cargo in the hold and the order in which it was loaded.

Frame installed for stereophotogrammetry on the wreck «Panier 3»
© A. Chéné, CNRS, CCJ, Aix-en-Provence

The key player in underwater archaeology in France is the Département des Recherches Archéologiques Subaquatiques et Sous-Marines (DRASSM) (Department of Subaquatic and Underwater Archaeological Research). This is a national department of the Ministry of Culture, which oversees the application of the French Heritage Code and ensures the protection, study and promotion of maritime cultural heritage.



The Porto-Novo Roman wreck in Corsica, carrying architectural elements (columns...)
© A. Touzet, Drassm

WRECKS DISCOVERED ON THE NARBONNE COASTLINE

In 1970-74, when the Gruissan marina was being developed, successive dredging operations destroyed several cargo dumps and ripped open at least 5 shipwrecks, sucking up some of the cargo and dumping it on the beach. Only a small proportion of the artefacts discovered have been added to the museum's collections.



General view of Gruissan, with Gruissan pond in the foreground, Grazel pond and Mateille pond in the background © F. Hédelin



Fragments of Roman ship hulls found on the beach at Mateilles in the 1970's

For a time, researchers wondered whether these remains were evidence of a port complex, or of ships that had run aground during storms in their attempt to enter the lagoon. It is this second hypothesis that is now favoured. These wrecks have been identified and studied mainly on the basis of the remains of their cargo and their on-board equipment (the hulls of the ships have only been found in tatters).

It should be noted that this series of wrecks spans a long period, from the Grand Bassin A site, dating from the 4th to 3rd centuries BC (protohistoric period), to the Grazel B wreck, dated to the 7th century AD (Byzantine period). This testifies to the intense use of this area by ships over several centuries.

Bronze ship's ornament in the shape of a dolphin, found in Mateille, 4th century © A. Späni, Narbo Via,



Oil lamps discovered at Gruissan, «Grand Bassin C» wreck, 2nd century © J.-M. Colombiers

One of the wrecks that has yielded the most finds is that of Grand Bassin C: dated to the mid-second century AD, it has revealed a cargo of stamped Italian mortars and over 2,300 small oil lamps produced in Italy. These low value-added goods can be explained by the issue of essential return freight: a ship cannot sail empty. If its return cargo to its port of departure is insufficient, it has to take on ballast. Clay materials, despite their lower market value, are always preferable to ballast.

Several other wrecks have been discovered on the Narbonne coast: at Port-la-Nouvelle (Les Estagnols), at La Nautique (cargo from the Montfort cove and fragment of a ligature wreck) and at Mandirac (wreck of a 5th century port lighter).

THE PORT SYSTEM OF NARBONNE



Map of the port system of Narbonne with the main outputs explored
 © J. Cavero, V. Mathé

Since 2010, the collective research project on the ancient ports of Narbonne has brought together a team of researchers with the aim of identifying the port areas and reconstructing their movements in space and time. The urban port and several sites around the lagoon, described by historiographers as outports, form a port system. Archaeological excavations carried out at several of these sites have highlighted the port's activities: control, storage, unloading, freshwater supply, etc.

THE PORT OF PORT-LA-NAUTIQUE

Once in the Narbonne lagoon complex, boats headed for the mouth of the River Aude. A landing stage and a large villa with a huge fishpond were built near this mouth in the 1st century AD at Port-la-Nautique. The villa, estimated to be 130 metres long, had numerous mosaic rooms. Built on a raised area, the villa must have had at least one storey and a corner tower. It was highly visible to all the boats entering the port system of Narbonne.

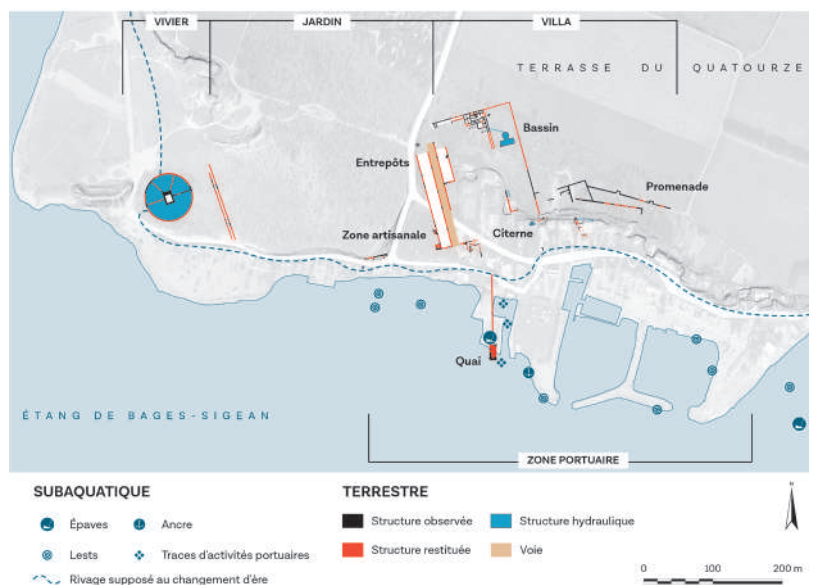
Port activity at La Nautique is well documented by the transshipment of amphorae, most of which were wine amphorae from Catalonia and sigillates produced in Millau. Large warehouses, some 150 metres long, were used to store products, particularly wine, preserved in large ceramic jars. This port occupation did not last more than a century (30 BC - 65 AD), however, because the quays acted as sediment traps, causing hypersedimentation that filled in the port basin.



General view of Port-la-Nautique, with the villa site below, the modern marina in the background, opening onto the Montfort cove © V. Lauras, Glob-drone



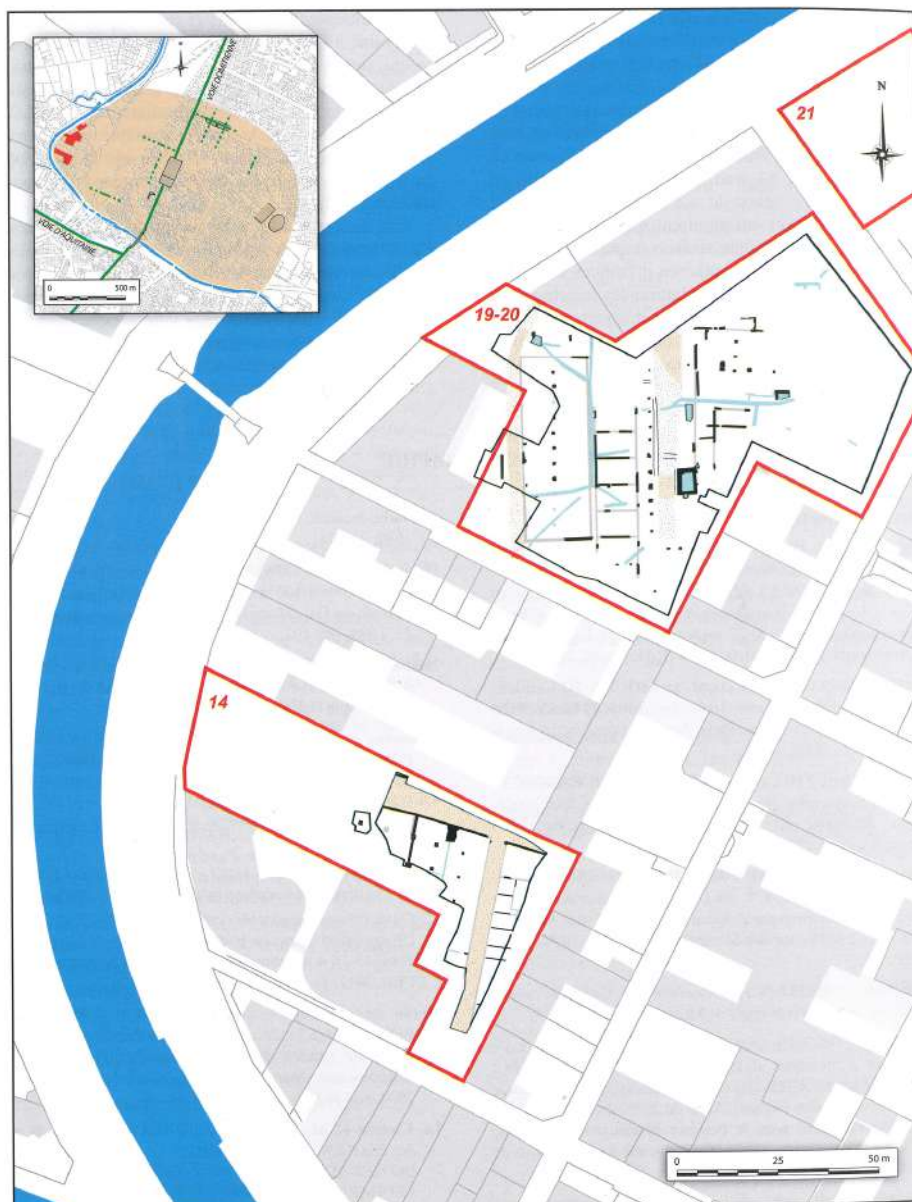
Evocation of La Nautique (jetty, warehouses, fishpond) in Roman times, computer-generated image on a contemporary aerial photo © P. Cervellin, CNRS



General plan of Port-la-Nautique, showing all the remains discovered © C. Sanchez, J. Cavero, CNRS

THE URBAN PORT

The port of the town itself has long remained unknown due to recent urbanisation. However, it has been explored in the course of new construction projects requiring preventive archaeology. Excavations carried out in 1991 at the Saint-Loup site, close to the left bank of the Robine canal, revealed a possible quay buried under almost 2.50 metres of silt. Further upstream, 2 kilometres away, several warehouses and shops were discovered on the Quai d'Alsace, which appear to have been built near the river from 25 AD onwards. This concentration of storage spaces can be explained by the fact that they were located close to a point where the load was not only carried by the river, but also by road (the original route of the Domitian Way).



Assembly of general plans of the excavations at 19-20 quai d'Alsace (A) and 14 quai d'Alsace (B). © O. Ginouvez, Inrap and J. Ollivier, Hadès, based on cadastre.gouv.fr land registry.

THE PORT OF LE CASTÉLOU-MANDIRAC

The development of the mouth of the Aude at Mandirac and Castélou was to take over from Port-la-Nautique. Recent excavations have shown that, during the 1st century AD, the natural sandy levees deposited by the river were used as the basis for almost 2 kilometres of embankment. The jetties were built using a system of wooden caissons filled with materials in order to advance into the water. They have a span of 15 to 25 metres and frame a channel around fifty metres wide. The right bank is a real communication route, where goods from large ships are transferred onto flat-bottomed boats to reach Narbonne, 6 kilometres upstream. This canalised mouth, which was constantly repaired and extended southwards over the centuries, was Narbonne's main outpost until the 5th century.



Mandirac, general view of the left bank in its late state © C. Durand, CNRS-CCJ



The construction of dikes to channel «Aude» at Mandirac © P. Cervellin, CNRS



Castélou and Mandirac dykes, south of Narbonne. Evocation of the river mouth. © P. Cervellin, CNRS

THE ISLAND OF SAINT-MARTIN IN GRUISSAN

The Saint-Martin site in Gruissan occupies a strategic position at the entrance to the Narbonne lagoon complex. A lighthouse was used to guide ships arriving from the open sea towards the entrance to the lagoon and to make it easier to cross the barrier beach. Because of the difficulty of this operation and the delicate conditions of navigation in the lagoon (uneven water depths, currents, violent winds, etc.), it is likely that personnel responsible for guiding boats locally and/or towing them were stationed at Saint-Martin. Sailors and merchants could also find a number of services there, in particular the opportunity to wash, as shown by the presence of baths, and to eat and rest before setting sail again.

The discovery of a sword and scabbard also suggests the presence of soldiers. The site was in fact placed on the front line for the various administrative procedures related to trade, and in particular customs procedures. The large central courtyard building could have participated in this tax administration closely related to the functioning of the port system.



Antique tuileau concrete cistern, used to store freshwater, discovered at the foot of the Saint-Martin lighthouse
© G. Duperron



General view of the Saint-Martin-Le-Bas site (Gruissan), with the archaeological site in the foreground and the Grau de la Vieille-Nouvelle in the background
© P. Benoist



Hypothèse de restitution - Patrice Cervellin - Document de travail - 31/01/2019

PORTS AND MARITIME ROUTES

In Roman times, the ports were the lifeblood of an entire network of communications and trade linking regions that were sometimes far apart. Today's historians present the Mediterranean, *Mare nostrum*, as an immense interconnected web.

Roman ports were often river-lagoon or river-sea ports. Ostia, Arles and Lattes, for example, show the same configuration of ports at the mouths of rivers and adaptation to changing environments.

In ancient times, the Mediterranean was criss-crossed by maritime routes that alternated according to the weather. The seasons were therefore more or less favourable for navigation. The «bad» season occurred in winter and was known as *mare clausum* (closed sea). The «open» period, *mare apertum*, runs from early March to mid-November.

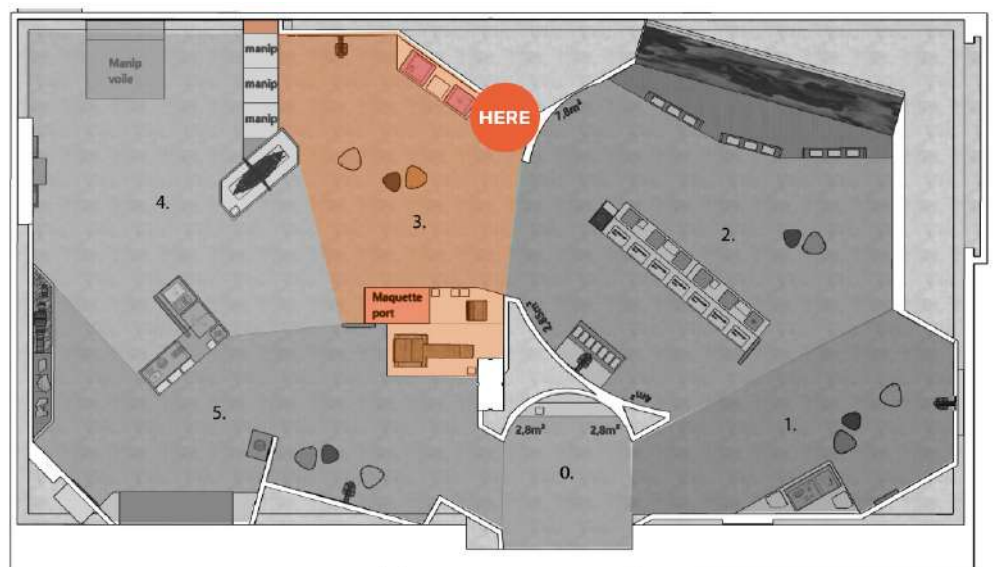
Ancient navigation relied on perfect knowledge of sea distances, winds, currents, stars and coasts. Assessing the distance travelled was based on the pilot's experience and the qualities of his ship. Some ancient authors estimate that a day's sailing (5 hours in fine weather) in a straight line and with a favourable wind corresponded to a distance of 700 stadia (or more than 800 kilometres). However, ships could often remain docked for several days waiting for favourable winds!



THE OPERATION OF THE PORT AND ITS ACTIVITIES

The port of *Narbo Martius* was part of a complete port system covering the whole town and the lagoon.

It was made up of several sites with complementary functions, enabling all types of ships to be received, their goods unloaded and then stored before being shipped on. This port system evolved over time in response to natural constraints, testifying to the ingenuity of the Roman builders and the vital role played by the port in the eyes of the city's public authorities. The construction of the port structures themselves sometimes required workers to use special techniques to build in the water. The port's activities involved a large number of people, as evidenced by the many remains: tools and everyday objects, figurative representations and inscriptions. You can imagine the quays and warehouses teeming with people performing a wide variety of functions, from sailors, merchants and shipowners, through dockers and tax inspectors, to the many specialised craftsmen responsible for maintaining port structures and ships.



PORT TRADES



The port of *Narbo Martius* was teeming with activity. It underwent major development between the end of the 2nd century BC and the 2nd century AD, in parallel with the exceptional boom in trade in the Roman Mediterranean. This dynamism led to the emergence of a number of trades. Trade and maritime transport are among the activities best illustrated by sources in Narbonne.

Marble funeral altar of the maritime navicular Ti[...] Iunius Eudoxus. His activity as a transporter of olive oil produced in southern Spain was undoubtedly in order to supply Rome in the middle of the 2nd century © A. Späni, Narbo Via

The great maritime transporters involved in supplying Rome held key positions in the port elite. They were known as *naucularii* (shipowners, carriers) in the colony of Narbonne. The mosaic in the Piazza dei Corporati in Ostia, which depicts the ports and provinces involved in supplying the capital, mentions the *Nau[cularii] Narbonenses*. *Mercatores*, like the *mercator* (= merchant) *Cordubensis*, ran a small commercial business.



Funerary stele of Marcus Fabius G[...], merchant from Cordoba, who settled in Narbonne for business during the 1st century, translation: For Marcus Fabius G[...], freedman of the three Marcus, merchant from Cordoba © A. Späni, Narbo Via

The *mercatores*, like the *mercator Cordubensis*, ran a small trading business.

In addition to these port professions, a whole range of other activities were closely linked to life in the port. Professional money-handlers, money-changers and bankers are mentioned in local epitaphs. Those involved in port taxation must have worked intensively in this area, close to the quays and pontoons or in more specific buildings. Controllers and measurers (mensores), employed to check the conformity of goods and prevent fraud, were also undoubtedly present in the port area of Narbonne.

The construction and maintenance of the port required a large workforce of specialised workers and marine carpenters. Excavations have revealed that port construction used large quantities of wood and required a skilled workforce.



Wooden sheet piling used to build the Mandirac dikes
© C. Sanchez, CNRS



Evocation of the wood-working trades involved in building the dikes
© P. Cervellin, CNRS

Finally, craftsmen and shopkeepers were also able to make a living in this microcosm. Picators, for example, worked with pitch, which was used to caulk boats and seal ceramic containers, particularly amphorae. The over-representation of innkeepers in local epigraphy seems to be linked, among other things, to the bustle of the port, which was frequented by all kinds of transients. One of them, the most famous, was from Tarragona and ran an establishment in Narbonne known, rather ironically, as “Au coq gaulois” (“Gallic cockerel”).

The least prestigious position was occupied by slaves. Generally speaking, however, they played a vital role in port life, as labourers, porters and stevedores. The most qualified slaves were often employed as representatives of their masters’ trading activities, managing their interests and accompanying the goods onto the ships to keep an eye on them.



Photo of a quay being excavated in the Castélou area of Narbonne. In Roman times, it was surrounded on one side by the lagoon and on the other by the river. A building (warehouse?) and an unloading machine base bear witness to goods transfer activities © S. Sanz, CNRS



Hypothetical reconstruction of the quay uncovered at Castélou in Narbonne © P. Cervellin, CNRS

TOTEM: THE ROMAN WHARF AT PORT-LA-NAUTIQUE

Between 1999 and 2003, research carried out at Port-la-Nautique by the Narbonne Association of underwater archaeological studies and works (ANTEAS) uncovered a quadrangular structure 22 meters long and 8.8 meters wide, under the modern quay in the western basin.

This structure, built from large blocks, is enclosed in a wooden plank enclosure, the base of which could not be reached by drilling at a depth of 4.10 meters. Because it is not watertight, it cannot be considered as a cofferdam (a wooden caisson) used to build a watertight structure inside. The structure is made up of six elevated courses resting - 2.70 meters below the bed of the pond. On the inside, two horizontal ashlar courses frame and support the inner core of the foundation, which is made up of ashlar and rubble.

In comparison with other constructions of this type in the Mediterranean basin, a number of interpretations can be put forward, including that of a mooring, a lantern tower, a bitter (a fixed landmark used for maritime navigation), or even a lighthouse. The large Nautique anchor, which can be seen on the museum's permanent tour, was found nearby. To the north, two alignments of piles mark out a possible wooden pontoon that would have linked the building to the shore over a distance of around one hundred metres.

TOTEM OTHER SIDE 1/2: THE MONUMENTALISATION OF THE PORT, FROM NARBONNE TO FRÉJUS

While ancient ports were functional places, designed primarily to meet practical needs (accommodating ships, facilitating their unloading, etc.), they were also places where the municipal authorities could showcase the city's power. One of the finest examples of this type of development is perhaps the Alexandria lighthouse, which, over and above its practical function, had become one of the Seven Wonders of the Ancient World, thanks to its size and extraordinary décor.

For Narbonne, the Saint-Martin lighthouse undoubtedly fulfilled this ostentatious function. The Mandirac-Castélou site has revealed the presence of 2 large parallel jetties that channeled the lower course of the Aude. Although archaeologists were unable to excavate the southern end because of the marshy nature of the land, it is highly possible that this structure was decorated with a monumental feature.

Recent discoveries show that the Roman port of Fréjus (*Forum Iulii*) was equipped with a similar structure: the basin of the port of Fréjus was closed off to the south by a jetty around 150 m long, built on a substantial riprap of stacked stone blocks. At the end of the jetty was a platform bounded by a monumental balustrade, part of which was found in the sea sands.



Restitution of the end of the southern jetty of the Roman port of Fréjus © V. Fichaux, Fréjus

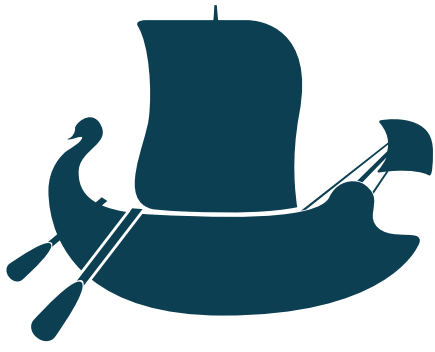
TOTEM OTHER SIDE 2/2: THE MONUMENTALISATION OF THE PORT, FROM NARBONNE TO FRÉJUS

Each element of this balustrade was made from sandstone and assembled with the other parts by using a system of mortise and tenon joints. This balustrade was intended to mark out an esplanade on which probably stood a building designed to mark the entrance to the port. Its shape is unknown, but several blocks of local blue porphyry suggest that it was an imposing building.

It's also worth noting that, unlike Narbonne, Fréjus has found several remains of pozzolan concrete, a lime mortar mixed with volcanic sand developed by the Romans, which had the particular ability to «set» even when submerged in water.



Part of the Fréjus railing when it was first discovered
© P. Excoffon, Service du Patrimoine, ville de Fréjus



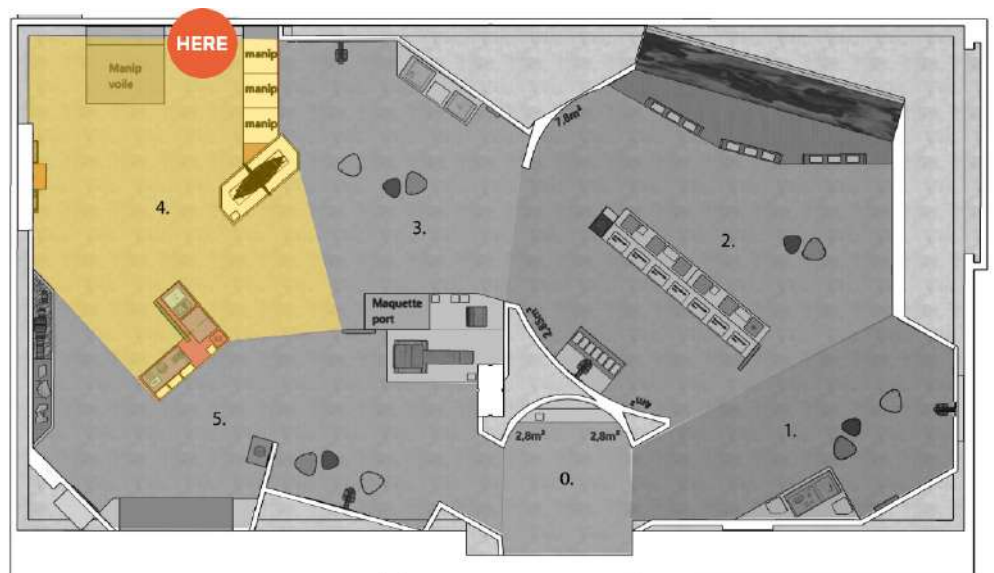
FROM PORT TO PORT: NAVIGATION

No port without ship! Ships were essential to the commercial dynamism of the Roman Empire. The many shipwrecks found all over the Mediterranean give us a better understanding of these highly technical tools.

Large tonnage vessels or small port lighters, sailing ships, rowing boats, towed ships, boats sailing on high seas, coastal navigation or river-lagoon vessels: the sizes and shapes of these ships varied greatly and were always adapted to their function.

As sea voyages could last several days, sailors and travelers had to make sure they had a minimum of comfort on board (food, body care, entertainment). Through a series of highly eclectic objects, we can imagine the daily lives of the sailors and merchants who sailed from one end of the Mediterranean to the other.

But sea travel was often a dangerous adventure, so it was vital to secure the protection of the gods and ward off the evil eye. Many of the beliefs and rituals associated with sea travel are known to us through ancient texts and archaeological artefacts, revealing a rich imagination and mythology.



DAILY LIFE ON BOARD

A ship is not only a place of work, but also a place where sailors, merchants and passengers live together. The discovery of a wide variety of shipboard objects in the wrecks gives us a better understanding of daily life at sea.

Food, for example, was essential to ensure a safe crossing! The many items of galley furniture unearthed in the wrecks and the evidence of their use bear witness to this crucial aspect. Cooking areas were sometimes built into ships. These could be portable (foculus), made of lead and tin, or fixed, made of bricks and tiles. Wheat cakes or porridges made from flour were cooked in them, making up the staple diet. Water was stored in amphorae or dolia (large jars). Fishing also provided a substantial food supplement.

Some objects were used for other daily activities: washing (strigiles, ointment bottles), leisure (dice, tokens) or beliefs (statuettes, amulets). The work of sailors is evidenced by the presence of tools used in the day-to-day maintenance and repair of the ship: sheets of lead used to dress the hull, woodworking tools (saws, drills for making holes, etc.).

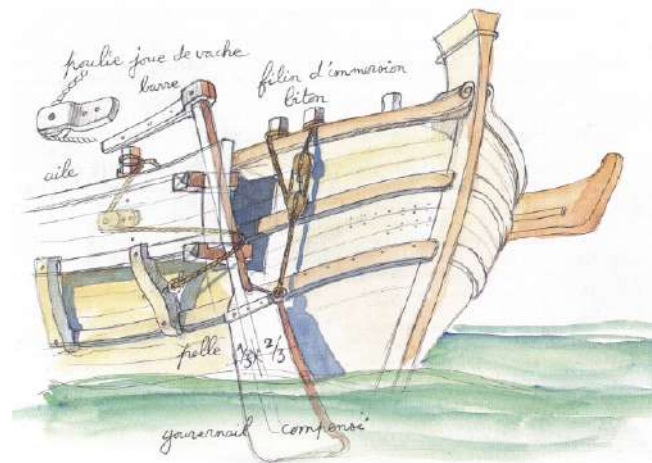
THE BOAT, A HIGHLY TECHNICAL TOOL



Roman merchant ships were mainly sailing vessels, with one to three masts depending on their size, fitted with a so-called «square» rig, in reality a rectangular sail. The sail was suspended from the middle of the mast by a horizontal piece called a «yard».

Restitution of a ship with details of sails and fittings © J.-M. Gassend

The sail is adjusted by means of arms that steer the yard and sheets that present the sail to the wind. A large number of ropes, pulleys and hoists are used above deck to hoist and control the sail. This type of rigging is optimised for downwind sailing (aft or sideways), but is less effective when the yacht has to sail upwind. Before the arrival of the stern rudder in the Mediterranean at the end of the Middle Ages, ancient ships were steered using two side rudders, one to port and the other to starboard.



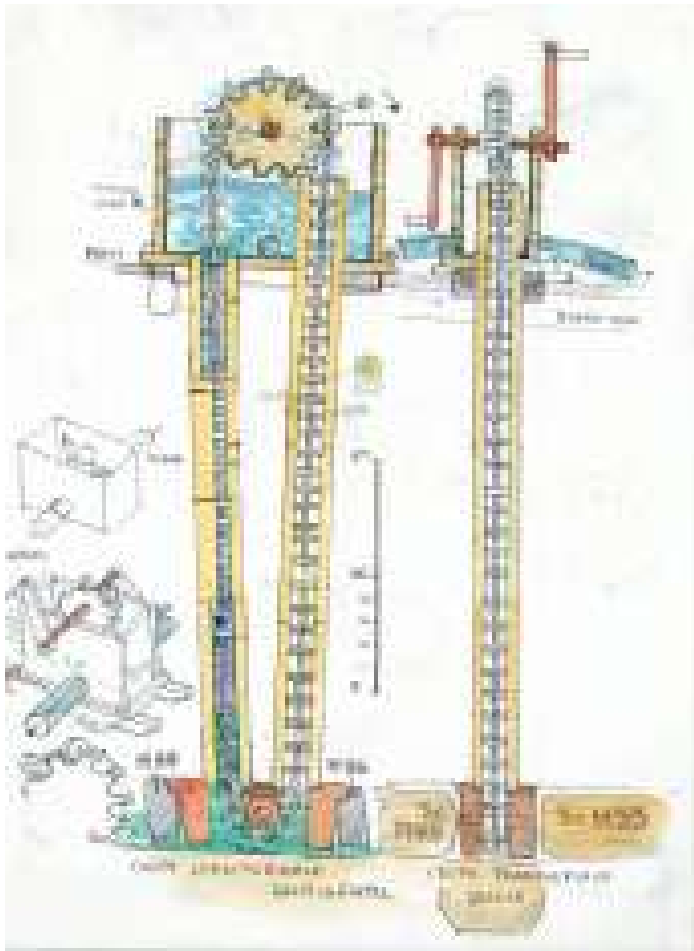
Restitution of the stern section of a Roman ship, with detail of the rudder oars © J.-M. Gassend



Only the rudder on the opposite side to the wind was submerged and could be activated. This is the great originality of ancient ships, which can be seen in many representations.

Bas-relief depicting the stern of a ship, including the rudder oar (part of the Narbo Via museum's permanent exhibition)

© L. Damelet, CNRS-CCJ



Ships of a certain size are often equipped with a bilge pump system that allows the water that accumulates at the bottom of the hold to be pumped up to the deck of the boat, thanks to a rosary pump system.

Restitution of the bilge pump on the «Saint-Gervais 3» wreck (Bouches-du-Rhône)
© J.-M. Gassend

Finally, some specific objects are linked to the safety of the vessel, such as sound signalling tools like conch shells or bells. Lead sounders are used when approaching the coast to determine the depth and nature of the seabed.



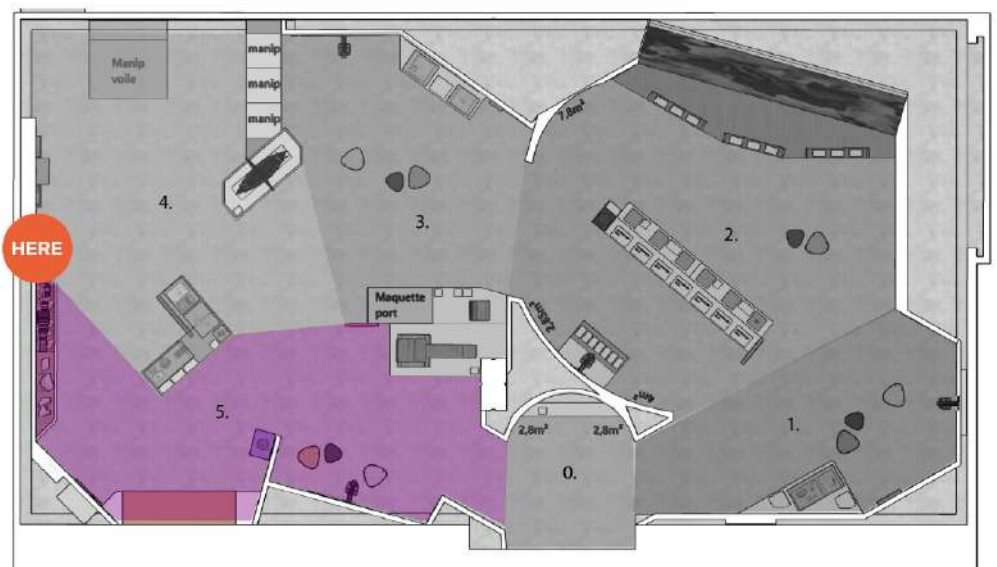
THE PORTS OF *NARBO MARTIUS* IN LATE ANTIQUITY (4TH-6TH CENTURY)

«It is to you that the seas of the East and the ocean of the Iberians pour their merchandise and their treasures; it is for you that the fleets sail on the waters of Libya and Sicily; and all the laden vessels that travel in all directions along the rivers and seas, everything that sails in the whole universe comes to land on your shores» (Ordo Urbium nobilium, 118-128).

This is how the poet Ausonius, between 388 and 394, described the variety and number of goods that converged on Narbonne.

Despite the changes that took place in the 5th century, the old colony continued to play a major role in strategic, geo-economic and religious terms. The city was transformed: ancient monuments, such as the great temple of the «capitol», were dismantled, while several early Christian basilicas were built.

The great traditional trade networks of the Mediterranean area continued to exist at least until the 7th century. For example, the Aude-Garonne route (two French rivers), like the Rhone route, was still a major route for goods entering Gaul from its gateway, Narbonne, which was the terminus of maritime links to other major Mediterranean ports, notably Rome and Carthage.



THE PORT, A DEVELOPMENT INDICATOR IN LATE ANTIQUITY (4TH-7TH CENTURY)

From right to left

Narbonne's monuments recycled in port developments

Unfortunately, Narbonne has not preserved any of the great monuments that adorned it in Antiquity, with no doubt as a result of the recycling of materials that began in late Antiquity. It was, in particular, thanks to the discovery of another remarkable feature of Roman Narbonne, its port, that the monuments of the «very beautiful city» mentioned by the poet Martial in the 1st century AD reappeared in the form of recycled fragments. In fact, to raise the dykes damaged by the River Aude, the Romans used blocks from several buildings, in particular those from the great temple known as the «capitol», which are characterised by its remarkable size and white Carrara marble. Massive columns made of marble from Teos (Turkey) also bear witness to the import of costly materials from far away, for the construction of monuments in Narbonne. Of course, the finds at Castélou-Mandirac represent only a tiny fraction of the ancient buildings that have been scattered over time. They do, however, show that by the 5th century AD, monuments dating from the early centuries of the colony were abandoned and used as quarries.



Heap of fragments of Narbonne's monuments dismantled and reused in the harbor dikes in the 5th century
© C. Sanchez, CNRS

The wreck of Mandirac

The wreck of Mandirac is an original discovery: this wreck was found in Mandirac, during the late reconstruction (5th century) of the jetty on the left bank of the Aude, south of Narbonne. The boat, estimated to be between 12 and 13 metres long and 3.30 metres wide, was reused as a caisson to repair the dyke and was then completely covered by blocks.

The recycling of old boats for port construction is well known. However, it is more difficult to explain the presence of a part of the shipment. In Roman times, a guild of divers known as *urinatores* was responsible for salvaging shipments in the events of shipwrecks. The amphorae in this case were not recovered because they were broken, which suggests a sudden event (storm?). The cargo consisted of oil and fish sauce amphorae from southern Spain and Portugal, as well as amphorae from the Cartagena region and North Africa.

The technical characteristics of this boat, the position of the mast for towing, its cargo and the absence of any on-board crockery indicate that it was a river boat that had just unloaded a seagoing vessel from a port-warehouse in southern Spain (Cadiz or Cartagena).

The discovery of this wreck provides a snapshot of the history of the port's activities, as well as a major contribution to our knowledge of trade and naval architecture.



The wreck discovered at Mandirac corresponds to a boat providing a link between the Aude embouche and the urban warehouses. It would have been involved in unloading a deep-sea vessel, such as the Port-Vendres 1, with cargo from southern Spain bound for Narbonne.
© P. Cervellin, CNRS

The Mandirac wreck is a 5th-century boat that provided a link between the river mouth and the town. It was loaded with amphorae from North Africa, southern Spain and Portugal. Its remarkable state of preservation is due to its burial in a damp environment, protected from light and xylophagous organisms
© B. Favennec, CNRS



The evolution of trade routes in the western Mediterranean

Throughout the last few centuries of Antiquity, the port of Narbonne remained fully integrated into the major maritime trade networks: it gathered products from all over the Mediterranean world in its warehouses and redistributed them to the hinterland and to Toulouse and Bordeaux via the Aude-Garonne route.

During the 4th and 5th centuries, trade was particularly intense with the Hispanic peninsula, which exported oil from Betica (Andalusia) and fish sauces from Lusitania (Portugal). Other amphorae come from the Cartagena region, on the south-eastern coast of Spain, but the identification of the products they contained remains uncertain. However, production from North Africa, mainly from the Carthage region (Tunisia), was the most abundant at that time, with the three main commodities transported in amphorae (wine, oil and fish sauce) and large quantities of crockery - mainly large 'sigillated' ceramic dishes, but also sometimes cooking vessels - as well as oil lamps, often with very elaborate decoration. Finally, top-quality wines are regularly sourced from several regions of Italy (Tuscany, Calabria, Sicily) as well as from the eastern Mediterranean..



Map of the Mediterranean showing the provenance of various types of amphorae imported into Narbonne during Late Antiquity (4th-6th centuries).

© C. Sanchez, P. Salvat, J. Caverio, W. Brocq, CNRS

The example of a journey from Alexandria at the end of the 4th century:

Sulpice Severus, a Gallic chronicler and ecclesiastic from the late fourth century, gave an account of his journey from Alexandria to Narbonne: he embarked in Alexandria on a cargo ship that took 29 full days and nights to reach Marseilles. From there, it took a further 10 days to reach Narbonne, part of which were spent in Marseilles, no doubt until the Mistral wind fell, because there was no question of fighting against it to sail in this direction. (Sulpice Severus, Dialogues, I.1)

The wreck of the Redoute Béar (Port-Vendres), testimony to the role of the port of Narbonne in the 5th century

Discoveries made on land and underwater bear witness to the still very active role of the port of Narbonne at the end of Antiquity.

The wreck of the Redoute Béar at Port-Vendres, dated to the first half of the 5th century, is a case in point. The ship's point of departure was undoubtedly Narbonne, as evidenced by the discovery in its hold of numerous architectural remains - the largest weighing up to 40 kg. These fragments are exactly the same as those found in the Mandirac jetty. At this stage, we don't know whether they were transporting materials for a lime oven or ballast to keep a less-than-fully-loaded ship in line. Whatever their final destination, these stony materials could only have been taken on board at Narbonne, along with the rest of the cargo, which consisted mainly of wine amphorae from Asia Minor, along with smaller quantities from Cilicia (south-east of present-day Turkey) and Gaza, and a few African and Italic amphorae. A large quantity of glassware (cups, goblets, stemware and flasks) in olive green or dark yellow was also found in this wreck.



The wreck of the Redoute Béar at Port-Vendres under excavation: a fragment of marble is being removed
© H. Colonna d'Istria

TOWARDS AQUITAINE

The Aquitaine isthmus was mainly supplied with products from long-distance trade via its links with the ports of Narbonne. This traffic reflected the dynamism and wealth of this Mediterranean hinterland, as well as the economic importance of the cities of Narbonne, Toulouse and Bordeaux, all of which were celebrated in the late 4th century in Ausone's collection of illustrious cities of the Roman world.

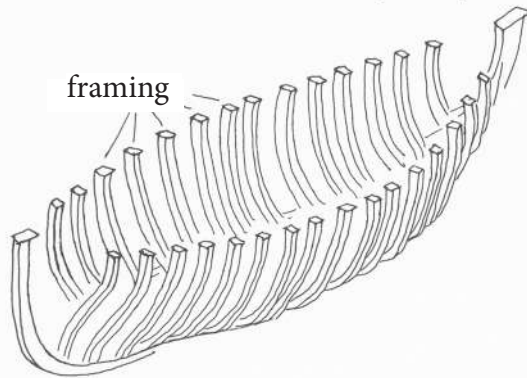
The products of Mediterranean trade - ceramics, wine amphorae, oil and fish sauces, glass, as well as sarcophagi - are attested to by both archaeological and literary sources. Oriental wines from Gaza and Syria/Turkey, highly reputed and expensive, were regularly consumed in Narbonne.

It is assumed that jewellery, precious clothing, silks, ivory, Egyptian papyrus, incense, mastic and spices were also found there. Cumin, cinnamon and cloves, as well as fruit (dates, figs, almonds, etc.) from the Orient, were used in food and medicinal preparations.

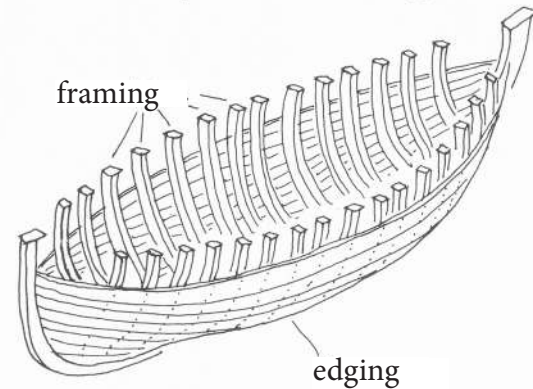
Return shipments are more difficult to identify. Texts mention raw materials such as tin, copper, lead, wood, pitch and honey, but also and above all slaves from the North (Bretons, Saxons), sent to Mediterranean ports to be sold.

AFTER THE 5TH CENTURY, THE TRANSITION TO THE MIDDLE AGES

1. Construction de l'ossature (ou squelette)



2. Mise en place du bordage



Schematic diagram showing the main stages in skeleton shipbuilding, which was gradually introduced in the Middle Ages.

After the 5th century, commercial ships underwent a gradual evolution in terms of construction techniques, heralding the arrival of the ships of the medieval and modern eras: it was during this period that the transition took place in the Mediterranean from shipbuilding on planking, in the Greco-Roman tradition, to skeleton construction, which was to become the rule until the Industrial Revolution. In the former, the planks that make up the ship's shell are assembled first, followed by the frames. The second method, on the other hand, involved first the building of the skeleton and then the fitting of the planking.



View of the coastal part of the Saint-Martin island, archeological site in Gruissan, where an ancient lighthouse, then a church surrounded by an early Christian necropolis and finally a tower built from the 10th century have been built successively © V. Lauras

In terms of trade, African products were still regularly imported in the 6th century, as were wines from the eastern Mediterranean, particularly wine from the Holy Land. There were also significant arrivals of tableware produced on the coast of Asia Minor (now Turkey). At the end of the 6th century, Narbonne, like other major provincial capitals, still had a highly cosmopolitan population, including a large Jewish community, Syrians and Greeks.

In the 7th century, the port of Narbonne continued to maintain long-distance trade links, as evidenced by the wreck of a ship arriving from Constantinople: the wreck *Grazel B*, beached at Gruissan, yielded a monetary treasure representative of the currency in circulation around 630. A number of bronze objects were also recovered, including a very rare Byzantine balance beam.

As political and economic frameworks changed, and the mouth of the River Aude moved, some sites disappeared, but others were occupied in a different form, notably Saint-Martin-le-Bas, which continued to control the coast until the Middle Ages (10th-12th centuries), when commercial activity in the port of Narbonne once again expanded considerably.



The site of Maguelone (South of France) and its cathedral, which developed in the early Middle Ages in a natural context comparable to that of Saint-Martin
© B. Ode, UMR AS