Sailing Masterpieces

Ship Design and Aesthetics in the Naval Iconography of the 17th Century

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Tradition is not the worship of ashes,

but the preservation of fire.

– Gustav Mahler

Contents

Introduction

1. Ship design, iconography and human history

The first traces of means of water transportation, even if rudimentary, date far back in human history. Already the antique civilizations of Mesopotamia and Nile designed ingenious systems to cross the water, from wineskins full of air to more complex devices.[1] Thenceforth, ship design developed during the ages, reaching along its evolution, high levels of quality and significant innovations. Simultaneously, another element has accompanied humanity in its evolution, and that is iconography. The term "iconography" derives from the Greek word εἰκονογραφία (eikonographía), which is the union of the words εἰκών-όνος "eikonos" (image) and -γραφία "-graphia" (to write). It means a "figurative representation" of a subject and thus, it is the way that people "represent ideas in pictures or images".[2] Already prehistoric humans started to testify their presence by drawing walls of caves, and this desire for communication has not yet been exhausted.

Historians have studied the evolution of maritime and naval history through naval iconography, and the use of naval iconography as historical source has produced remarkable results. An example is the work with the suggestive title *Le musée imaginaire de la marine antique* by Lucien Basch, published in 1987, in which the evolution of shipbuilding in ancient times is showed to the reader by a text riches in images of naval iconography from bas-reliefs, decoration in vases, mosaics, etcetera. The year before this publication, in 1986, the naval historians Peter Kemp and Richard Louis Ormond, who was at the time director of the National Maritime Museum (1986-2000), had published the book *The Great Age of Sail. Maritime Art and Photography*.[3] In this work, maritime history

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[1] L. Basch, *Le Musée imaginaire de la marine antique,* Athenes, Institut hellenique pour la preservation de la tradition nautique, 1987.

[2] Pearson Education Limited (Ed.), *Longman Dictionary of Contemporary English*, Set in Nimrod by Letterpart (UK), printed in China, 1978 (1st ed.), 1995 (3rd ed., published in 2003), p. 803.

[3] P. Kemp, R. Ormond, *The Great Age of Sail. Maritime Art and Photography,* Oxford (England), Phaidon Press, 1986.

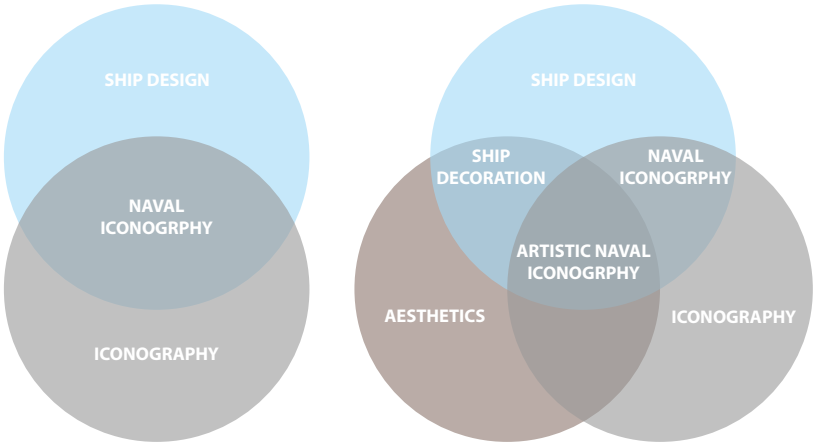
and naval iconography have been mixed to enhance the collection of paintings preserved at Greenwich. In this work, iconography is not a "tool" used to enrich the historical narration; on the contrary, text is like a frame which, as Ormond wrote in the preface, should help "to explain the significance of the pictures themselves." In these and other works, and with different approaches, historians have showed the connection between ships and naval iconography. The link between the two disciplines of history and iconography has created excellent results. The belief and the wish that this connection could be productive also from a design point of view are the reasons for this dissertation. In the binomial history-iconography, a third discipline is here added, and this is the design. Design, history, and iconography are the three areas that the present study aims to analyse; more precisely, the aim is to study the history of ship design through iconography, the latter used as both historical evidence (iconography from the past) and modern support to show and explain technical aspects.

Studying history can help to create a cultural background for naval design. Nevertheless, it is not evident how it can directly affect the subject, especially going far back in time. For this reason, it becomes crucial to answer a critical question: in what way can research on the history of ship design be advantageous for the design? It would be difficult to try to define how the shapes and techniques of the past could influence the modern design process. Therefore, it is not in the products of a designer that an answer can be found. Instead, the attention should focus on the designers themselves and their role. Generally, the interdisciplinarity of a study can create new opportunities and areas of work in which a designer could be influential. Designers have technical and peculiar knowledge that is a valuable resource, and experts in other fields could take advantage of it. Studying naval iconography from the point of view of a designer could stand out facts not noticed or not deeply studied yet. Indeed, designers are not only "makers" of new objects and shapes but also specialists who can offer their knowledge, skills, and point of view to different research areas. Furthermore, an iconographic approach can also find practical aspects related to didactics and cultural knowledge sharing. Indeed, temporal and sometimes lexical distances are insurmountable barriers that separate the present world from the past. An iconographic apparatus can help people, even without a background, who want to study naval and nautical history, for the immediacy of images makes the world of ships more understandable, allowing disclosure to the interested public.

Ship design and iconography have intertwined since ancient times. Indeed, over the centuries, these two children of human ingenuity constantly influenced each other. To introduce the topic, iconography will be temporarily referred to as "art" in a broad sense. Indeed, even

though art and iconography are not synonymous, they are deeply linked together, and iconography concerning maritime or naval themes has primarily had an artistic soul for a long time in its evolution. The link between art and ships has two distinct branches; synthetically, they can be described as "art on ships" and "ships in art". The first case represents the "active" intervention of artistic production, which permeates the space of shipbuilding with an aesthetic taste revealed in the ornament; since man began to build ships, they almost immediately began to decorate them with artistic elements, transferring an anthropomorphic symbolism onto them. Indeed, ships have always been decorated by drawings on their hulls or ornamental elements, such as the *rostrum* in the Greek and Roman ships, or the bow with beastly heads in the Vikings ones. Decoration had the dual purpose of instilling courage in themselves and frightening the enemy, thus attributing to ships a personality and equally a spirituality capable of supporting men at sea. The constant concern for ship aesthetics shows the high value that man has always conferred on ships. This ambivalent connection has its continuity also on the terrain of art. That is the second case of "ships in art". In their varied production, artists have found space for the representation of maritime and naval subjects from ancient times to recent days. Therefore, a "passive" presence of ships in iconography is revealed. All those images having naval or maritime subjects are included in the definition of "naval iconography". Summarizing, the link between ship design and art finds its expression in ship decoration and naval iconography. Since not many remains of ship decoration have survived, and since written sources are rarely concerning the relationship between ship design and art, naval iconography is the main original source that can be studied. Through the naval iconography produced in the past, it is possible to trace a visual history of the evolution of ship design, which sometimes may be able to give information that no coeval text contains. Thus, this vast iconographical apparatus represents a precious source of knowledge about ship design and its evolution. That is particularly true for those periods in which shipbuilding was still an "art" more than a "science", for there were not yet scientific texts containing precise data on ship design.

Regarding both art and decoration, aesthetics has influenced ship design and consequently naval iconography. Thus, studying the relationship between ship design and naval iconography, it becomes crucial to take into consideration this aspect. The trinomial "ship design-iconography-aesthetics" opens new ways by introducing different perspectives in the study of ship design. Decoration of ships is a subject often overshadowed by more technical or humanistic perspectives, but taking into consideration the aesthetic concern of different periods, it becomes clear how decoration often played an important role in the maritime world until the Age of Sail.



The trinomial "ship design - iconography - aesthetics" highlights different aspects that otherwise could not be appreciated.

The *cheniscus* and the *aplustre* adorning bow and stern in ancient times, as well as the figurehead and other wooden statues of modern ships, had not only a decorative meaning. They were symbols of the soul of the ship as well as of the identity of the crew and their origins. For this reason, ornaments also played a role in naval battles; victory over enemies was often praised by removing some of these decorative elements from the enemy ship. It metonymically represented the conquest of the entire ship. As they were the symbol of the ship, they had to be visible and recognizable but also perfectly merge with the structure underneath. All the decoration and the ornament had to be designed before the construction of the ship, not only regarding the subject itself but also considering how to collocate them on the hull. They could have an impact on the seaworthiness, as they could be heavy and cumbersome elements. A design approach in the study of these factors could help to understand to what extent all the decoration actually influenced the life of ships, from the construction to their service. That is in part what the present research aims to analyse. In order to do that, iconographical evidence is not enough. Indeed, paintings and drawings are able to show how ships' decorations appeared but not how they were made. For this reason, a direct and physical study of ship decoration finds is required. Nevertheless, iconography does not become useless but changes its purpose. From a historical source, it becomes a support able to go beyond the technical description. Indeed, pictures, schemes and drawings made in the present day are iconographic sources as well, which have been revealed to be a fundamental tool. Studying the decorations of ships, it becomes evident that iconography is a primary source of knowledge for a researcher. Indeed, the written records of the time concerned mostly political, administrative, and technical aspects. And if, on the one hand, it is hard to find texts about ship decoration, aesthetics was precisely shown in naval iconography, especially in the artistic production. Therefore, visual records become fundamental

elements for the comprehension of ship design in the past, in which aesthetics had a crucial role. Thus, iconography can become a tool for learning and transmitting knowledge concurrently with literature that has expressed its interpretative and narrative skills of the history of shipbuilding only in the last two centuries. In this way, naval iconography is advantageous for the description, classification and interpretation of its subject and an indispensable element for perceiving how the evolution of ships took place over time and in different places in the world.

Specific topic

As the history of ship design is a broad topic, it has been necessary to identify a specific period to study. An initial and generic inspection has highlighted how the subtle but persistent intertwining relationship between ship design, aesthetics, and iconography experienced an intensification of mutual influences during the 17th century. It happened when the newborn European fleets were preparing to dominate the seas undisputed, boasting the presence of new, majestic and mighty ships of the line. The "ship of the line" corresponds to a type of warship developed from the 16th-century galleon, which for the first time, saw the presence of numerous guns on its sides, placed on different tiers. This new firepower proved decisive in maritime combat, so much to lead to the definition of a new naval warfare scheme called "line of battle". At the beginning of the century, a name was coined for the new ships fighting in line; they were called "ships of the line". The interest of European states increasingly projected towards ocean routes, and these new vessels were the best means of transport for these trips. Consequently, the state attributed great importance to the ships of the line, and thanks to it, singular and reciprocal influence took place between artistic and naval production. The 17th century is the century of the powerful warships characterized by a massive decoration of high artistic level as well as the moment in which a new artistic genre saw the light and the subsequent fortune, that of marine paintings. The relationship between art and shipbuilding led to the creation of wonderful artistic masterpieces. They were paintings made by the brushstrokes of expert painters and solid ships enriched by high-quality decoration. Thus, the link became closer physically, with the decoration of ships, and virtually, on the canvases. This close link between ship design, aesthetics, and iconography is the primary reason for the decision to select the 17th century as the period for this research. Moreover, artistic developments undertaken during the Renaissance made art more realistic, and the Dutch interest in real-life influenced artistic production, making, on the whole, paintings and drawings more reliable from a historical point of view. Therefore the naval iconography

turned out to be an analytical and descriptive representation that allows a clear and in-depth reading, able to provide detailed information on the naval and maritime world.

During the 17th century, several kinds of ships were used all over Europe, and they were all, more or less, decorated. To restrict the subject, a selection was necessary on the type of ships. The first decision was to concentrate mainly on warships and examine only marginally the merchant ships. The reason is that warships were becoming increasingly important during the century, and the attention of states was generally more focused on their military fleet than on their commercial ones. Consequently, there are more details and information on warships, and at the same time, iconography often was about flagships, scenes of battles, and naval subjects more than commercial harbours. Nevertheless, a study on merchant ships and their decoration would be possible and of interest, especially in comparison to warships; indeed, it would observe whether the aesthetics of merchant ships were given as much attention as warships.

In particular, the "ship of the line" has been identified as the main subject, for it became the iconic warship of that time, attracting the attention of states. Indeed, ships of the line, especially flagships, had become a tool for the propaganda of state power, and the decoration developed into an essential aspect of their design. It was decided to limit the geographical context too. In particular, England, the Dutch Republic, and France have been analysed in more detail. This choice is due to the great importance that these three actors had during the century and because they represent three political situations – a parliamentary monarchy, an absolute monarchy and a republic – which influenced in different ways ship design and decoration. Nevertheless, during the research, other European powers were taken into consideration, even if to a lesser extent. Particularly in the last part of the present dissertation, the Swedish context was analysed more in detail for what concerns the study of the warship *Vasa* (1628), preserved at the Vasa Museum of Stockholm.

Structure of the work

The work is organised into two main parts, analysing different aspects of the relationship between ship design, iconography and aesthetics. The first section concentrates on how the concern for aesthetics influenced ship design through artistic decoration. Firstly, a short introduction of the "ship of the line" has been made; it begins from the former typologies of ships and continues describing how and why this new warship was created and became the main typology in use at that time. In this earlier part, it is already evident the role that the political powers played in the evolution of the ship of the line. Secondly, the attention focused on the

aesthetic of these warships and the strong influence that monarchies had on them. Indeed, in the epoch of the great fleets and absolute monarchies, European kings saw in their warships a perfect tool to express the power of their reigns. Moreover, thanks to some coeval records, it is possible to see the effect of decoration on ship design and the opposing opinions on it. The last part is dedicated to France as it represents a particular case in which the king style intensely influenced the aesthetics of ships. Through this example, it is possible to see the close link between politics and warships decoration, not only in the blatant affinity with the Louis XIV style but also in the numerous written records which illustrate the relationship between the prime minister and other figures from the arsenals and naval world.

In the second section, a case study is illustrated. This concerns the analysis of the Swedish warship *Vasa* (1628) and her decoration. *Vasa* is the only known warship which has survived up to the present day. For this reason, she represents a *unicum* and is the only find useful for a practical study of ship decoration in its whole context (the ship). Thanks to the collaboration of the Vasa Museum of Stockholm, it has been possible to start a first-hand study of the warship and her decorations; this study had taken three months and made it possible to understand the relationship between the structure and the ornaments, allowing some considerations about the design process which had led the construction of this warship. Since the rest of the research is mainly based on naval iconography evidence, the analysis of *Vasa* also has the role of a real example that can confirm or deny what the coeval iconography shows, and for this reason, it is a fundamental and conclusive part of this research.

Finally, at the end of the work, an appendix contains a brief introduction and some materials for further research about naval iconography of the 17th century. Since iconography is always a way of communication, it implies a message, a sender and a recipient. Because of that, depending on several aspects, different kinds of images had been identified. As already mentioned, a distinction concerns what can be described as "artistic" naval iconography and what should have another definition; in order to classify all those images not properly created with an artistic aim, other two types of iconography have been identified and divided into "descriptive" and "technical". The appendix shows the main characteristics of these three categories with respect to their evolution and the impact that they had on ship design. The artistic naval iconography is the most analysed as it represents the main source used in the rest of the present work.

2. Notes

Date of the launch

Every time that a ship is mentioned for the first time, a date is placed in brackets at the side of the name, which is always in italic. This date corresponds to the year of the launch of the ship.

e.g. *Vasa* (1628) > It means that *Vasa* was launched in 1628.

The launch year is particularly relevant when comparing two ships with respect to the context. Therefore, this choice is intended to ease the temporal collocation of ships with respect to the period in question.

Quotations

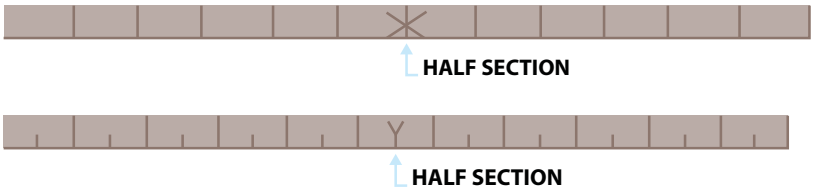
All quotations are reported in original versions without any alterations. To ease the reading, English translations have been written beside the quotations in foreign languages. If not specified, translations are made by the author.

Unit of measurement

Length, beam, draft, and tonnage are the main measures used to describe ships. Nevertheless, in the 17th century, measurements were not standardised. Each state and region had its units and also the same unit, as "feet", could correspond to a different measure depending on the geographical area. Trying to compare measurements about ships, it became necessary to conform dates with the same units. For this reason, it has been decided to use European units, as meters for linear dimensions and tons for tonnages. Below, some of the main units of the time are shown and compared.

Linear dimensions – Length, beam and draft are the primary linear measures of ships. At that time, the length (L) generally corresponded to the keel length, the width (B) was taken at the maximum beam, and the draft (D) was that in the hold at the main section. The unit more in use for linear dimensions was the foot. Nevertheless, a 'foot' corresponded to different dimensions depending on the place. For instance, a French *Pie du Roi*, was about 6% longer than an English imperial foot. These

slight inequalities could generate considerable differences in the great dimension. At the Vasa Museum of Stockholm, carpenters' rules used for the construction of *Vasa* are preserved. They show the difference between Swedish and Dutch feet and testify that shipwrights could work together using different units. In Netherlands, each region had its foot. The most



Personal drawings based on the rules preserved at the Vasa Museum of Stockholm. Probably a Swedish (up) and a Dutch (down) rule.

used for shipbuilding were the Amsterdam foot (used in Amsterdam and in the near cities) and Rhineland foot (used in the surroundings of Rotterdam). According to Van Yk, the Rhineland foot was 30,8 cm, while the Amsterdam foot was 28,3 cm.[4] In the present work, meters have been used as common unit to describe and compared ships. In the following grid, it is possible to see the relationships between feet and meters used for the conversion of the main units.

1 Imperial foot (England)	1 Pie du Roi (France)	1 Amsterdam ft (Netherland)	1 Swedisf foot (Sweden)	
0,304	0,324	0,283	0,297	meters

Tonnage – It was one of the most distinctive aspects of ships, especially merchant units. It told owners the amount of goods that they could carry, and authorities used the tonnage to impose taxation. For these reasons, it was deeply tied to the load capacity. In England, during the 14th century, king Edward I applied a tax on ships based on their capacity to carry tuns of wine. Measurements were based on linear dimensions and so the resulting number was a volume in cubic feet, called 'ton' from tun (of wine). In 1582, the shipwright Matthew Baker (1530 – 1613) formulated a calculation system which multiplied keel length, beam, and draft, then divided the result by a coefficient equal to 100. In the 1620s, the Corporation of Trinity House of Deptford refined Baker's rule. They used a coefficient of 94, generating a tonnage which was about 20% higher than the previous one. It was known as the Builder's Old Measurement and was expressed in tons burden (tons *bm*). Shipwrights working in the Thames area, called 'Shipwrights of the River' used a similar formula with

[4] B.E. van Bruggen, "Beschouwing over het aangeven van de hoofdafmetingen van Nederlandse zeeschepen en de daarbij gebruikte maateenheden (1600-1800)" in *Mededelingen van de Nederlandse Vereniging Voor Zeegeschiedenis*, No. 20, Nederlandse Vereniging Voor Zeegeschiedenis, March 1970, pp. 25-34.

a coefficient of 94 (or sometimes 100).[5] In the 1620s, William Gunter, John Westhorrle, S. Wells, H. Lydiard and Edward Stevens formulated another rule. On 25 May 1626, Sir John Coke (1563 – 1644), secretary of state, received a letter about it. The description told some interesting details about English tonnage rules.

> [...] They chose the *Adventure* of Ipswich, which is specified in the warrant and is one of the greatest 'bilged' ships amongst them, as a model upon which to base their calculations. A ship can be measured according to the old way as used by the king's shipwrights or the new one recently practised. The old way is nearer the truth but since the basis is unknown to them, the writers have discarded it. They reject the new way because it is based on the dead weight of coal 'which lades a ship fitter to sink than to swim in the sea'. They have therefore devised a middle way. The tons and tonnage of a ship can be regarded in 3 ways: in casks, 2 butts or 4 hogsheads making a ton; in ft, 40 ft of timber making a ton; or in weight, making 20 cwt. a ton. The 'feet' way is the most convenient for measuring an empty ship; the 'weight' way is the most uncertain because the hold can be filled with 'dead lading of differing weights'; the 'cask' way is best because it both allows a convenient burden to the ship and ordnance for defence. Elsewhere, a ship's burden is based upon her capacity to carry casks. They define the hold as 'the cavity of the vessel contained between the lines of her greatest breadth and depth within board, not regarding the ill laying of their orlops, [...]. They next considered how many casks could be carried in the hold, first by drawing the bends and the form of casks in each bend. This way being subject to error, they used an arithmetical approach, allowing 4½ ft as the length of a butt, 2 ft 8 inches for the depth of the first tier, and 2 ft 4 inches for that of other tiers. They calculated it in ft and divided the whole by 60 because they found that a ton of casks stowed to the best advantage took up 60 solid ft of space. On that basis, the capacity of the hold of the *Adventure* was 207 tons. From that an easy rule can be deduced for the use of measurers, which is understandable by shipowners. The depth of the ship at her greatest breadth to the ceiling should be taken; at half the depth, the breadth within board should be measured; this mean breadth should be multiplied by the depth, the product by the length of the keel, and the total divided by 65 to obtain the content of the ship in tons. So the mean breadth of the *Adventure* within board is 22 ft, her depth from the ceiling 9 ft 8 inches, and her length 63 ft 6 inches. These multiplied together, make 13,504, which divided by 65 is 207¾. If 69¼ is added to allow the third part for tonnage, the ship is 277 in tons and tonnage. A comparison was made with her coal carrying capacity. The [coal] meters office showed that she unloaded 187 and 181 chaldrons on 9 Aug. and 6 Sept. 1624, a 'medium' of 184. Allowing 1½ tons per chaldron (although others think

Two rules were recognised. The 'old' is Baker's one.

The new method was based on the weight of coal.

Tons and tonnage could regard: volume (casks, ...), length (ft), mass (cwt).

Generally, ship's burden was based on her capacity.

Arithmetic was used to avoid errors, as support of a previous graphic approach.

The method had to be simplified to be understandable by shipowners.

Two widths from the mid section were included; one at the ceiling and one at the half of the depth. In this way, they were trying to insert the variation of the shape of the hull.

[5] W. SALISBURY, "Early Tonnage measurement in England", in *The Mariner's Mirror*, 53 (3), 1967, pp. 251-264.

1⅓ tons), that is equivalent to 276 tons. [...][6]

The answer shows all the errors that, according to Coke, the method proposed had, stating the preference for the formula based on dead weight of coal. In this letter, it is possible to appreciate those details and element which were taken in to consideration for the tonnage calculation.

> [...] As to the first or 'cask' method, Gunter and Wells have made the utmost use of art to ascertain the cavity of the hold by ft but to find the content by art is impossible. Besides, no account was taken of the fact that ships carrying casks require ballast, which is called 'kentledge', without which ships will not 'sail-fast' or be fit for the sea in any way and for which seamen allow 12 or 13 tons per 100 in stowing casks. So from the first rule, the *Adventure* is 232 in tons and tonnage. The second way is rejected because a ship's burden cannot be accurately measured by taking the measurements within board. The thickness of plank and timber varies, which makes a ship greater or smaller. It is also contrary to experience because when a ship's side is furred 6 or 8 inches, she will carry 10 or 12 tons more, and if 15 or 18 inches, 25 or 30 tons; yet in each case the measurements within board would be the same, which would be absurd. This also applies when measurements are taken of the depth, which should be taken not from the ceiling, but from the outside of the plank next to the keel. Accordingly, the *Adventure* is 229 in tons and 305 in tons and tonnage, based on a length 63½ ft, a breadth of 26½ [26 ft 8 inches], a floor of 21½ 1/12; [21 ft 7 inches], and a depth of 11¼ ft. The third or 'old' way, which Gunter and Wells think is more accurate, is not so in the case of ships lately built such as colliers which have great floors. It does hold good for old ships which have small floors. On the old rule, the Adventure, with a length of 63½ ft, a breadth of 26½ 1/6[26ft 8 inches] and a half breadth of 13⅓, would be 225 tons, to which must be added 75, making a total of 300 in tons and tonnage. Contrary to the view of Gunter and Wells, the dead weight method at 20 cwt. to the ton is a certain one if truly applied, 'for their reason that this way is uncertain, it is no reason; for let the severals of dead weight be of what nature it will, still the quantity, viz. 20 cwt. to a ton holds'. If a ship is laden until she is settled in the water to her breadth, which is the lading mark, then the weight in her is the certain burden in tons, at 20 cwt. a ton, to which must be added tonnage. This method is based on reason, experience, antiquity and art.[7]

Ballast had to be considered in the tonnage calculation using the 'cask' method.

Thickness of plank and timber should be take into consideration measuring the burden.

Thickness of plank should be considered measuring the depth.

The method of the dead weight of coal was considered the most reliable from the Trinity House.

As highlighted by the previous letters, different measurement gave different results for the same ship, and opinions about which was the right way did not coincide. The Builder's Old Measurement – also called

[6] G.G. Harris (ed.), 'Transactions - vol. 2: 1626-7', in *Trinity House of Deptford Transactions, 1609-35*, London, 1983, pp. 78-90, f.2. (25 May 1626).

[7] *Idem*.

'Old Rule' or 'builder's measurement' – and the Thames builders' one were the most common, and they were still in use in at the beginning of the 19th century.[8]

Since the tonnage was expressed in tons or tons *bm* even if calculated by a different formula, measurements were always ambiguous. If this was the status of tonnage measurement in England, the situation was even more complex in a European context. Indeed, even if tonnage was one of the most important dimensions to describe and identify a ship, each state had it's rules and its dimensions. Similarly to England, in France the tonnage was based on capacity of ships and was linked to the inner volume. They referred to it as *port* or *jauge* and it could be expressed in cubic feet or tons (*tonneau de jauge*). In 1681, an ordinance state that 42 cubic feet were equal to 1 "tonne de mer".[9] It was then similar to the English definition, where a ton was 40 feet. Considering the relationship between English and French feet, the units are similar, and since there was not a perfect conformity even between English tons, the margin of error can be deemed void.

The Dutch Republic used a unit for the load capacity called *last* (*lasten* if plural). The tonnage of ships was then defined "lastenmaat". As for England tonnage, also the calculation of a *last* was ambiguous. It was related to a bulk cargo but could be composed of different goods, of which grain was the most common. Moreover, the cargo capacity could be described as both a volume (cubic feet) and a weight (pound or kilograms).[10] Generally, a *last* can be considered equal to 4.000 pounds (about 2.000 kg), although it could change depending on the area. Thus, 1 *last* is equal to 2 tons of displacement (a unit of weight), which have not to be confused with tons of tonnage (unit of volume). Often, the good used for this measurement was the Prussian rye, for it was one of the most traded goods by sea. Although there is little data on the weight/volume ratio of rye, a *last* can be considered to be around 134 Amsterdam cubic feet (3 m^3). Loads could be determined by fully loading a ship and then weighing the load, but they were almost always measured by a method where the product of length and width was divided by a coefficient. The last remained the principal unit used for warships until the half of the century, and by the second half, the length of ships and number of guns

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[8] W. SALISBURY, *Op. cit,* pp. 251-264.

[9] D. BARANDON, "La jauge des navires à Marseille au début du XVIIIe siècle", in *Commerce de gros, commerce de détail dans les pays méditerranéens (XVIe-XIXe siècles). Actes des journées d'études Bendor, 25-26 avril 1975*, Nice, 1976, pp. 43-73.

[10] R. PARTHESIUS, *Dutch ships in tropical waters. The Development of the Dutch East India Company (voc) Shipping Network in Asia 1595-1660*, Amsterdam, Amsterdam University Press, 2010, p. 17.

became the most used details to refer to ships.[11] In addition to the Dutch Republic, the *last* was generally used as unites for capacity in the in Northern Europe, as in Sweden, Norway and Denmark.

As mentioned before, 'tonnage' should not be confused with 'displacement' (long tons or tonnes), which is equivalent to the weight of the volume of water displaced by a ship. When displacement is given, that means that the tonnage of the ship was unknown and that it is the result of a modern calculation.

In the 17th century, tonnage was ambiguous data, and its calculation could change even if expressed in the same units and measured in the same state. It could depend on the formula used, as shown in the letter from the Trinity House, or on the ship shape. For instance, the two largest warships of the Swedish fleet in the 1560s were *Mars* (1564) and *Elefanten* (1560). Records of that time state that *Mars* had a capacity of 700 lasts, and the *Elefanten* of 400 lasts. Since it is improbable that one ship was almost double the other, Niklas Eriksson suggested that the explanation for this dissimilarity could lie in the shapes of ships. Indeed, while *Mars* had two complete gun decks, *Elefanten* had only one. Thus, *Mars* could carry cartloads of barrels – used for the measurement of the tonnage – in both decks, and *Elefanten* only in one, generating a double-size of capacity.[12]

Considering the ambiguity of tonnage, some approximations have been made, and, if possible, the unit used is the ton of burden (tons bm). However, since the tonnage is not always known, and given the differences between foreign fleets, and the complexity that can occur even when studying ships of the same state, comparisons are based mainly on linear measurements and the number of guns.

Propaganda in the 17th century

Talking about the decoration of ships of the line, the term "propaganda" has been used in this research. However, it is a modern term, not actually existing in the 17th century. It must be clear that no one was explicitly using this term at that time, and that it is a modern definition used to describe an action or an attitude. For this reason, it is not historically correct to use a word which was not yet born to describe something in the

[11] J. Bender, *Dutch Warships in the Age of Sailing 1600-1714. Desing, Construction, Careers and Fates*, Barnsley, Seaforth Publishing, 2014.

[12] N. Eriksson, "How Large Was Mars? An investigation of the dimensions of a legendary Swedish warship, 1563–1564", in *The Mariner's Mirror*, 105:3, 2019, pp. 260-274.

past. Nevertheless, the focus is here on the meaning of this word.

> **Propaganda** / information which is false or which emphasizes just one part of a situation, used by a government or political group to make people agree with them.[13]

Thus "propaganda" is done by an authority when it transmits an ideal thought, not necessarily corresponding to the truth. The tools used for this purpose can be different, and as history has taught, images are perfectly suited for this purpose. The term has previously been mentioned, talking about the seventeenth-century use of images, by different authors in previous works. In 1977, a paper published in the *The American Historical Review* analysed how iconographic sources such as printed documents, medals and pictures were used in England and Netherlands during the English Revolution (1688-1689) to promote a positive idea of the Prince of Orange.[14] In 2001 century, Peter Burke published his work *Eyewitnessing. The Uses of Images as Historical Evidence* showing once again how the term 'propaganda' perfectly suits the operations done by kings and monarchs from the 17th century, particularly for the French monarchy.[15] Considering the meaning of the term, as well as previous publications, it is opinion of the author that the use that seventeenth-century monarchies and states made of warships decoration can perfectly fit the definition of 'propaganda' since their intention was to emphasize the wealth and grandeur of their kingdoms.

Vasa Museum of Stockholm

As previously mentioned, part of the research was carried out during a period at the Vasa Museum of Stockholm. That allowed for a first-hand study of the original decoration of *Vasa*, which is currently the only 17th-century ship to survive in her entirety. Indeed, the museum allowed the author to participate in their activities concerning ship preservation, to go on board, and to study the sculptures in their magazines. This made it possible to directly examine decorations and their components, such as joints, pegs, and nails, going beyond a general description and formulating hypotheses about the design process based on a real example. For this

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[13] PEARSON EDUCATION LIMITED (Ed.), *Longman Dictionary of Contemporary English*, Set in Nimrod by Letterpart (UK), printed in China, 1978 (1st ed.), 1995 (3rd ed., published in 2003), p. 1313.

[14] Crf. L.G. SCHWOERER, "Propaganda in the Revolution of 1688-89", in *The American Historical Review*, Vol. 82, No. 4 , Oct., 1977, pp. 843-874.

[15] P. BURKE, *Testimoni oculari*, London, Reaction Books, 2001 (1st Ed., Tr. It. Roma, Carocci editore, 2020), pp. 69-92.

reason, the completion of the present work would not have been possible without the help and openness of the team working at the museum.

Part I

Aesthetics and Shipbuilding in the 17th Century

Previous page: Pierre Puget, *Design for the decoration of a Warship*, 17th century, Rogers Fund, 1963, The Met Fifth Avenue, New York.

Naval warfare has been an "art" that man has practised since the oldest time. The first traces of shipbuilding date back to ancient Egypt; ships were used both for trade and war. During the long and violent path of the evolution of naval battles, there was a decisive moment by which ships stopped being a tool used with different purposes depending on the circumstances and started being "designed" specifically for naval wars. That was the birth of warships. Generally, talking about the development of shipbuilding, if an invention can be precisely dated and attributed to someone, the evolution of a subject, as the birth of warships could be, is a long process which cannot be enclosed in a specific time. For this reason, it is not possible to declare what the first "pure" warship was, and not even who the inventor was. Nevertheless, it is possible to study the different typologies of ships used in different epochs and identify a time in which a specific kind of ship started to be a tool designed specifically for war. The galley, generally associated with war in Roman times, was not used exclusively for maritime warfare. It certainly did not possess a high storage capacity, given the rather slender and sharp hull lines; nevertheless, in its long life, which lasted till the 18th century, the galley had been used to transport both valuables and passengers, such as pilgrims or political ambassadors. It was appreciated for its speed which made journeys relatively shorter and safer, making it possible to escape the pirates who infested the Mediterranean seas.

Meanwhile, rounded and capacious ships proved their worth in maritime battles. Although these vessels were slower and not very manoeuvrable, their stowage capacity proved to be a advantageous feature. Indeed, they could carry many armed soldiers who came out at the moment of the battle and determined the victory with the numerical majority. The "round ship" was also widely used for trade; therefore, it was not intended exclusively for maritime warfare or commercial use. It was only in the 17th century that shipbuilding reached a turning point concerning the specificity of use. Technological advancement led to the birth of a new type of ship specially designed for warfare that indelibly marked the history of the European navies. It was the *ship of the line*, characterized by a large and complex sail armament and distinguished

from previous ships by the numerous cannons on board, which made it a deadly naval weapon. Therefore, ships of the line were large warships built and refined in the 17th and 18th centuries and crowded most of the sea routes on the oceans of the entire globe. The importance assumed by this type of ship for the time made it the iconic vessel of the 17th century.

Being an iconic ship meant that it became a symbol. A symbol of power, wealth, and glory. A symbol of those qualities that seventeenth-century monarchies wanted to be associated with the identity of their states. Following this evolution, the aesthetics of ships became one of the main aspects that had to be highlighted. Decorations on board exploded. Valuable ornaments started to embellish hulls and castles, colours and gildings were reviving topsides, and artists found arsenals to be new places of work. Thanks to iconography, it is still possible to appreciate those decorations and see how they adapted to the different tastes of each European naval power. The following chapter is about the evolution of ships of the line and how decoration affected shipbuilding and ship design. It is a story full of connections, striking cases or apparently isolated episodes, which in the historical network of events, as a whole, outline the birth and evolution of these ships of the line.

1. A new mindset

Consolidation of state power and birth of permanent state navies

What are the reasons for the new interest in shipbuilding developed in the 17th century aimed at designing ships exclusively for battle? To answer this question, it is necessary to look at the former period, searching for those political, economic, and social changes which allowed the affirmation of a new mindset in which the centralized organization of the maritime power of the next century had its basis. The principle of this change can be identified in the date that, by convention, marks the beginning of the modern age, namely 1492. Thenceforth, the life of Western man moved towards a direction from which they never turned back. The expansion of domains and economic and military supremacy characterized the new era. The "new world" was not only a precious source of raw materials to import into the old continent but also represented the right stimulus necessary for Europeans to go beyond the hitherto insurmountable borders and launch themselves towards the conquest of the world. There was a desire to discover the world, as well as mere greed for possible

personal enrichment. However, the opportunities offered by the new lands discovered overseas did not placate the internal conflicts between the European forces. On the contrary, they constituted additional reasons for military and economic clashes. Thus, during the European powers' expansion, the competition did not diminish; on the contrary, they saw a geographical shift, which slowly moved from the Mediterranean area towards the western coasts of Europe. In this dynamic scenario, new powers arose. They were capable of adapting and making the most of the new possibilities. At the same time, there was a decline in other centres which had hitherto represented the fulcrum of economic life. Given the maritime nature of the new trades, the history of these economic, political and social developments is connected inextricably to the evolution of shipbuilding. In some respects, it was precisely the ability to evolve naval techniques which allowed some powers to dominate, while in those areas where tradition prevailed over innovation, this led, in the long run, to the disappearance of large consolidated forces.

The 16th century began in a spirit of great general ferment for the geographical discoveries, which pushed the European powers to the desire to conquer new lands and strengthen their trades. The needs deriving from a new economy not only had repercussions on the maritime world but also led to changes in the terrestrial armies. Following this transformation, which Michael Roberts called *Military Revolution*,[1] changes in military tactics influence and transform states and societies. Examples of these changes are the reforms in tactics introduced in Netherlands by Maurice of Orange (1567 – 1625) in the 1890s and the developments of Gustavus II Adolphus Vasa (1594 – 1632) in his reform to the Swedish army in 1630. The new nature of armies required well-trained soldiers and professional officers capable of leading articulated formations. Discipline was necessary to manage more complex warfare tactics that required a high number of soldiers. Training and cohesion were the strengths of the new type of permanent military organization. This principle encompasses the profound change in the European military for both the army and the navy. The constant need to keep in operation squads of soldiers and armaments, which often had to fight miles away from the location of the central power, necessitated a new approach to managing the "military apparatus" in the broadest sense of the term. In the transition between the 16th and 17th centuries, this change in the structure of state forces led to a decisive organizational, institutional, and technical change in the naval world. As for the navy, the solution was the foundation of permanent fleets owned by the states. This solution was not an expected result if

[1] M. Roberts, *The Military Revolution, 1560-1660: An Inaugural Lecture Delivered Before the Queen's University of Belfast*, Belfast, M. Boyd, 1956.

compared to the habits of the time.

Already in 1509, aware of the growing importance of naval power, Henry VIII (1491 – 1547) built a small fleet and promoted an expansion which was both territorial and administrative. However, he cannot be credited with certainty with the creation of the "Royal Navy" in the modern sense.[2] Thus, England had already begun expanding its commercial network towards the new Atlantic routes in the mid-1500s. The Tudor period (1485-1603, including the reign of Elizabeth I) was a time of high development of Anglo-Saxon shipbuilding in the military and merchant fields. Nevertheless, England became an influential marine power during the following century. When Charles II (1630 – 1685) ascended the throne in 1660, he inherited a fleet of 154 ships. That was the beginning of a permanent state fleet known, since then, as the Royal Navy.

In the 16th century, one of the first states that relied massively on naval power was Spain. Indeed, since the discovery of Christopher Columbus (1451 – 1506), Spain managed to prevail in the conquest of the new routes and new territories. However, the real challenge was to maintain those domains and the international trade. Having control of maritime routes to other continents meant increasing naval and military power. That new international economy was based on a network of connections and exchanges articulated on trade routes across the oceans. Therefore, it was essential to protect these long-distance routes. For this reason, the Spanish monarchy financed shipbuilding and, more generally, the management and administration of ocean trade routes. At the end of the 16th century, King Philip II (1527 – 1598) decided to impose the Catholic faith and stop the expansion of the nascent English naval power. To achieve his goals, he ordered the creation of a fleet so impressive that he called it the Invincible Armada. It was made up of more than 130 ships, with over 3,000 guns, almost 9,000 sailors and more than 21,000 soldiers, so much so that it seems there was no family in Spain that did not have at least one member on board. The entire fleet is said to have numbered 32,000 people and cost 30,000 ducats every day.[3] The Spanish threat prompted England to strengthen the navy in turn. The preparation of the English fleet began relatively late, on the 1st of November 1587, and nevertheless it was ready at sea already on the 20th of December of the same year.[4] England was able to counter the attempted Spanish invasion

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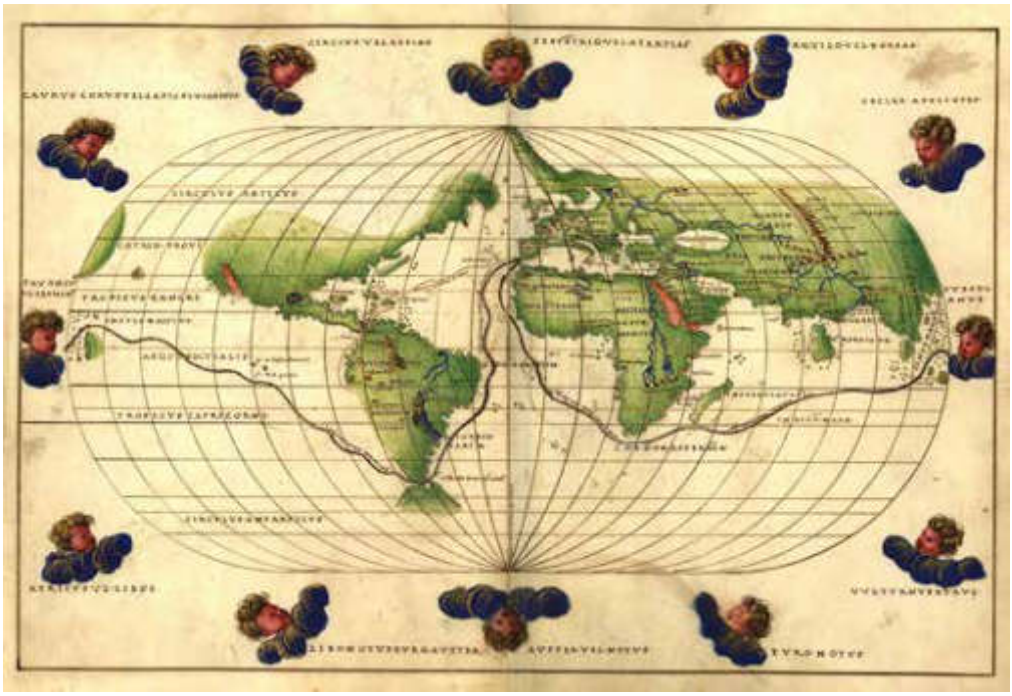
[2] M. Oppenheim, *A history of the administration of the royal navy and of merchant shipping in relation to the navy*, London and New York, John Lane, 1896, p. 1.

[3] J. Pine, *The Spanish Armada, 1588. The Tapestry Hangings of the House of Lords representing the several engagements between the English and Spanish Fleets*, Boston, Houghton, Osgood and Company, 1878, pp. 3-4.

[4] J.K. Laughton, *The defeat of the Spanish Armada*, London, Navy Records Society, 1894, p. 3.



Battista Agnese, *Worldmap*, 1544, Library of Congress, American Memory.

even if, despite the positive outcome for the English fleet in the Battle of Gravelines (8 August 1588), it was clear that in terms of military power, Spain was still superior to England. Indeed, of the 226 English ships that gathered for the battle, only 34 were ships owned by the Queen, while the rest belonged to private citizens.[5] However, although it was not technically a victory due to the supremacy of the English fleet, it represented a sign: the era of Spanish supremacy was coming to an end.

The rivalry with the Spanish fleet highlighted the importance of having a powerful navy always available. At that time, this was not an obvious step. The English ships perpetually in service in 1588 were less than 60 vessels and, in that year alone, involved an outlay of 91,000 pounds for their maintenance.[6] The end of the Spanish domain paved the way for new contenders for the sceptre of power. It was then evident that the power of a state no longer resided exclusively in the dominion of territory but much more in the richness of its commercial routes. The growing need to firmly maintain the monopoly, both on land and on the sea, led the various powers to strengthen their fleets. Naval power became so central as to condition the European political and economic fortunes. As the new century started, other powers were working on creating

[5] I. Friel, *Elizabethan Merchant Ships and Shipbuilding*, London, Gresham College, 2009, p. 1.

powerful fleets. In 1602, the Republic of the Seven United Provinces established the Vereenigde Geoctroyeerde Oostindische Compagnie (known as VOC) with the monopoly of commercial activities in the Dutch colonies in Asia. In 1624, Armand Jean du Plessis, Duke of Richelieu (1585 – 1642), known as Cardinal Richelieu, founded the Marine Royal. He was determined to provide France with a personal navy and eliminate the need for foreign shipbuilding. In this dynamic reorganization of naval powers, Spain, though at the height of her power, suffered a setback. That was probably due to a stagnation of its status as a ruling state. The lesser powers, especially the Dutch Republic and England, were not discouraged by the strength of the Habsburg empire. They continued in the race for supremacy, adopting new construction technologies and various commercial strategies that included an economic exchange with the enemy. Thus, while the stagnant situation of contrast between the Spanish and Ottoman naval powers persisted in the Mediterranean, the north-western part of the continent saw its political and economic dominance grow rapidly with the birth of maritime empires.

The growing value of commercial traffic to other continents has produced a significant change in the perception of the usefulness of fleets.[7] They were no longer only linked to border defence and seaborne support in campaigns of territorial conquest; the navy became the instrument necessary to protect ocean traffic and, therefore, the economic supremacy of states. Therefore, nascent state navies were essential tools for a state that wanted to excel in the seventeenth-century world. This new concept of priority assumed by naval power from a managerial, political, military, and economic point of view, which emerged during the 17th century, can be effectively summarized in the words of the French Navy Secretary, Jean-Fréderic Phélypeaux, Count of Maurepas (1701 – 1781); in 1745, he wrote:

> «Le commerce fait la plus grande richesse et conséquemment la puissance des États [...] les forces maritime sont absolument nécessaire pour les soutiens du commerce.»[8]

«Trade is the greatest wealth and, consequently, the power of states [...] maritime forces are absolutely necessary for trade support.»

The 17th century marks a new chapter in the history of shipbuilding. The duo "Spain-galleon" increasingly blurred, giving way to two new protagonists. They were a new nerve centre – Northern Europe and particularly England and the Dutch Republic – and a new weapon, the ship of the line, the backbone of the new fleets.

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[7] J. Glete, *Warfare at Sea, 1500-1650: Maritime Conflicts and the Transformation of Europe*, London, Routledge, 2000.

[8] M. Filion, "La crise de la Marine française, d'après le Mémoire de Maurepas de 1745 sur la marine et le commerce", in *Revue d'histoire de l'Amérique française*, Vol. 21, no. 2, Septembre 1967, p. 231.

English innovation, from the galleon to the ship of the line

To a large extent, the history of "ships of the line" is that of England, the Dutch Republic and France. Indeed, they were the states better able to manage the new fleets, decidedly expensive for the state treasury. In particular, England and the Dutch Republic were the powers that first understood the value and importance of developing a new attitude to naval warfare. Although Spain maintained large vessels throughout the 17th century, they nevertheless played a subordinate role concerning the North European fleets. Furthermore, other fleets, such as the Russian, Danish, Neapolitan and Venetian ones, were regional powers, very restricted to strictly legal trades in the Baltic Sea or the Mediterranean Sea. As a consequence of the new ocean routes, the attention of the Navy ministries focused on the formation of naval convoys. Ships had to be necessarily transformed since the old Mediterranean ships proved inadequate to sail the oceans. The need to travel ocean routes had raised new demands on shipbuilders. Indeed, long-distance voyages made harder by the ocean navigation conditions involved the construction of larger and more capacious ships. Nonetheless, the long routes required faster ships with greater sailing power, and soon, to increase the defensive ability on long trips, it was also necessary to introduce heavy artillery on more decks. That imposed a revolution of the consolidated forms in the naval building tradition of European shipyards.

During the 15th century, the ship that dominated the seas was the carrack, and at the dawn of the 16th century, it was still the predominant type. For example, the famous 600-ton *Mary Rose* (1511), which sank in its third conflict with the French fleet (19 July 1545), and whose wreck was later found (1836) and then recovered (1982), was a carrack. This type of ship had narrow and long hulls built with heavy structures to support the weight of the fore and aft castles and cannons, which increasingly began to be placed aboard. Generally, a carrack had several masts, armed with square sails on the bowsprit and the mainmast, and lateen sail on the mizzen mast, towards the stern; the latter was square in shape, an innovation compared to the previous round sterns. The peculiarity of the carrack was to have high castles both fore and aft, to facilitate the archers embarked on board in close combat and to attack the enemy bridge.[9] They were built with the carvel construction method, also called "skeleton construction", developed in the Mediterranean in the Middle Ages and also adopted in northern Europe from the first half of the 16th century, which supplanted the clinker construction for all types of ships, except for the smaller ones. Following the carvel method, the first

[9] D. Childs, *Tudor Seapower: the foundation of Greatness,* Barnsley, Seaforth publishing, 2009, pp. 20-21.

operation carried out was the construction of the keel. Then proceeded by arranging the transverse skeleton – the transversal sections called "ribs" – and only at the end was the planking applied, which had the function to covering the hull. Therefore, the hull followed the shapes of the ribs. The first rib to be built was the one amidships, coinciding with the main section. The other sections were proportionally made from the main stem, and the structural efficiency of the ship partly depended. Vice versa, the clinker method required the construction of the external skeleton first, subsequently reinforced by the internal ribs. Hulls built using the carvel method had smoother continuous surfaces and a more robust structure. That was considerably more suitable to withstand the effort that ships had to endure during the ocean crossing. Nevertheless, during the 16th century, carracks no longer suited the requirements.

The evolution of the carrack was the galleon. The Spaniards used it in their trips towards and from the overseas colonies, and it was designed for ocean navigation, combining a higher speed with good seaworthiness, and a reinforced hull. It also had to have adequate cargo capacity. To meet these needs, the hull was a combination of a round ship (as the *naos* was) and a galley, by which it also took the projecting beak. The rigging had been implemented to get more speed and manoeuvrability, and the forecastle was reduced, becoming an advanced sailing vessel. Most importantly, the new ship had to be able to defend the cargo from enemy attacks. For this reason, the two decks were loaded with cannons, as well as the half-deck, the quarterdeck, and the poop deck. This massive armament was the main feature that distinguished the galleon from other ships. Thus, galleon was designed to be a versatile ship. The great cargo capacity made it perfect for merchant ships, and at the same time, the artillery made it a great weapon. Indeed, many of the ships in the Invincible Armada were galleons. In the last decades of the 16th century, the English started building ocean-going galleons too. One of the first was the *Pelican* (1574), a 150-ton vessel built following the requests of Sir Francis Drake (c. 1540 – 1596), who designed her especially for his next trip towards the Strait of Magellan, crossing the Atlantic Ocean. The *Pelican* was a small ship 68 ft long (20.726 m) and 18 ft wide (5.486 m), but still, she had on-board eighteen cannons (seven on each side, plus four heavy guns in the bow) and a crew of 70 men.[10] This galleon went down in history, with the name *Golden hind* for having crossed successfully the Atlantic, sailed the Pacific, and finally made the circumnavigation of the globe.

Evolution of ship design – Sailing with galleons was safer then travelling with carraks. Nevertheless, there was still room for improvement and new

[10] A. HERMAN, *To Rule The Waves. How the British Navy Shaped the Modern World*, New York, Harper Collins, 2004, pp. 77-78.

Detail of: Hondius, Jodocus, *Vera totius expeditionis nauticæ,* Amsterdam (?), c. 1595, Library of Congress Geography and Map Division, Washington. The whole work shows a map of Francis Drakes's circumnavigation of the world. The ship is a representation of Drake's *Pelican.*

experiments in their design started soon. The first attempts to enhance the performance of ships had been made on English ships; the figure of Sir John Hawkins (1532 – 1595), naval commander and later Treasurer of the Navy (from 1577) during the reign of Elizabeth I (1533 – 1603), is particularly relevant in the first steps towards this new design. Indeed, starting from galleons, he experimented new proportions by lengthening the hull in relation to the beam and reducing the height; in this process, the forecastle was drastically reduced. With respect to the inner layout, the main difference was the introduction of a continuous lower deck, in place of the former solution made by two different decks, one in the aft and one in the bow, separated in the mid-hull. This complete deck, equipped with gun ports, was primarily used for the battery, and was called the "gun deck". To implement his ideas, Hawkins relied on two able shipwrights, who were Philip Pett and Matthew Baker. With them, he introduced some important changes in the design of ships and supported the construction of galleons with a new design. They were called "race-built" because the fore- and aft-castles had been razed or "raced".[11] Compared to former ships, the new race-built vessels were faster and more manoeuvrable, and they carried a substantial amount of artillery on board. One of the first ships to be built following these parameters was the *Dreadnought* (1573) armed with 41 guns; in the 1588 she participated in the encounter with the Spanish Armada under Sir George Beeston (c. 1520 – 1601). The development of artillery played an essential role in the evolution of the new design. Indeed, these increasingly sophisticated weapons were proving their devastating effect in naval battles. Thus, firepower was becoming one of the most valued features in ships. Consequently, the number of guns on-boar increased during the century. A few years

after the *Dreadnought*, Hawkins launched the *Revenge* (1577), which was particularly well equipped, with her 46 guns, of which 22 were heavy guns.[12] Another of these race-built galleons was the HMS *Ark Royal* (1587), which belonged to Walter Raleigh (c. 1554 – 1618) and then was sold to the Lord Admiral, Charles Howard of Effingham (1536 – 1624). Her tonnage was of 500 tons and she carried 55 guns.

The presence of more and more guns aboard was changing the structure of ships. Guns were placed in gun-decks, which were lengthened to carry an always-increasing amount of cannons.[13] From these "transitional" ships, the evolution had been the addition of another deck, till the creation of warships equipped with three fully armed decks. A first step was taken by the Danish warship *Tre Kroner* (1604). Designed by the Scottish shipwright David Balfour (1574 – 1634), she carried 80 guns arranged in two full gun decks. The champion of this project was the Danish king Christian IV (1577 – 1648), who saw in large ships a great tool to impress foreign powers and demonstrate that Denmark was a naval power too.[14] In this game, consisting of showing off the power of the kingdom through the navy, the English response was the launch of the *Prince Royal* (1610), built by the shipwright Phineas Pett (1570 – 1647) at Chatham, a two-decker with could carry guns also in the upper deck. The maxim level was reached in the second half of the 17th century, with the well-known three-decker *Sovereign of the Seas* (1637), which could carry one hundred guns, a number that will be surpassed by only few pieces.

New strategy, new name – In the 17th century, naval strategies undertook remarkable changes. No longer subjected to land forces, naval warfare drew the attention of captains, officers, and admirals who aimed to develop an increasingly defined naval tactic capable of enhancing the qualities of ships and making the most of innovative possibilities of offence offered by the artillery. Indeed, following the introduction of gun ports, side artillery was becoming an effective weapon in naval battles. These allowed an increase in the number of guns usable on board up to exceeding 180 pieces of artillery (43 cannons, 141 swivel guns) in galleons like *Henry Grace à Dieu* (1514), also known as *Great Harry*.[15] The employment of large-calibre guns on sides made evident the inferiority of short-range artillery. Consequently, it also made it unnecessary to maintain large fore and aft castles, once excellent as a raised area for archers

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[12] A. HERMAN, *Op cit.*, pp. 101-103.

[13] J.C. LEMINEUR, *I vascelli del Re Sole,* Nice, ANCRE, 2019 (Italian translation by Franco Gregorio), p. 21.

[14] M. BELLAMY, *Christian IV and His Navy, A Political and Administrative History of the Danish Navy 1596-1648*, Leiden, Brill, 2006, pp. 36-37.

[15] C.M. CIPOLLA, *Vele e cannoni*, Bologna, il Mulino, 2019, pp. 46-47.

and later for arquebusiers. Therefore, cannons led to a paradigmatic change in the approach to naval battles, a change definitively assimilated in the first decades of the century by the British government. In 1618, the Commission of Reform asserted that the future of naval warfare lied in artillery. For this reason, it proposed a reorganization of the Navy based on the supremacy of large-calibre guns:

> «Experience teacheth how sea-fights in these days come seldom to boarding, or to great execution of bows, arrows, small shot and the sword, but are chiefly performed by the great artillery breaking down masts, yards, tearing, ranking and bilging the ships, wherein the great advantage of His Majesty's navy must carefully be maintained by appointing such a proportion of ordnance to each ship as the vessel will bear.»[16]

A new perspective in naval combats was born. This process culminated in the codification of a tactic called *line of battle*, first regulated in a written form on 29 March 1653 by the Generals at Sea Robert Blake (1598 –1657), George Monk (1608 – 1670) and Richard Dean (1610 – 1653), through the drafting of various rules contained in the *Sailing and Fighting Instructions*.[17] According to this tactic, ships sailed in line, one behind the other, facing the enemy with their sides, which, thanks to gun-decks, were the most offensive parts. As explain by Paul Hoste:

> «Nous supposons que les vaisseaux de guerre sont armez de cannons qu'on range le long de leurs cotez: d'où il suit qu'un vaisseau ne peut pas combattre, qu'il ne presente la cotè à l'ennemi. De meme quand plusieurs vaisseau en combattent plysieurs autres, il faut que chacun de ceux-ci présente le coté à chacun de ceux-là, & qu'ils soient rangez sur deux lignes paralleles, [...].»[18]

«We suppose warships are armed with cannons along the sides: whence it follows that a ship cannot fight unless she presents her side to the enemy. Similarly when several ships fight several others, each of these must present its side to each of them, & that they are placed in two parallel lines, [...].»

Exclusively ships carrying guns could be considered "warships", and they were the only typology that could fight in the line of battle. In this strategy, ships sailed in line (i.e. one behind the other) and therefore warships ahead imposed speed and manoeuvres on those behinds. It followed that the slowest and less manoeuvrable ships had to stay in front. Indeed, they would not have been able to maintain the speed of faster vessels and the line would have been broken.[19] Moreover, not all the ships carrying guns could participate to the line of battle. The main decision was based on the kind of cannons that a ship could carry in the lower decks. Indeed, a small cannon would not have been able to damage the hull of an enemy vessel, and therefore, it would have been useless during a fight. For this reason, only vessels carrying at least 18-libbers guns in the lower decks could be

[18] P. Hoste, *L'art des armées navales [...]*, Lyon, Anisson, & Posuel, 1697, Source gallica.bnf.fr / Bibliothèque nationale de France, p. 18.

part of a line of battle.[20]

At first, the major problem in planning sea battles was the lack of homogeneity that characterized vessels and a strict classification of warships was required to organize and manage the battle line since. Therefore, fleets needed a standardization of ships; this was necessary to increase efficiency and facilitate the organization and planning of a strategy based on the size and equipment of warships. Consequently, a specific classification was created, according to criteria of size and fire-power.[21] These new warships were called "ships of the line", as they were intended to fight in the line of battle, and were divided into classes, or ranks, according to the number of guns. They were divided into different ranks, depending on the dimension and number of cannons on board. The *first-rates* were the most prestigious and largest warships of a fleet, having a superior fire-power that generally ranged from 70 to 100 guns. The largest of them were intended to become flagships and thus played the role of reference point in naval operations. The *second-rates* were equipped with a lower armament (around 50/70 guns) and thus decreasing towards lower ranks.

Having been the ones who first codified the line of battle, The English were also the first to use it rigorously. They used it during the Second Anglo-Dutch war, in the Battle of Lowestoft (13 June 1665, New Style). That event proved that a standardise and well-planned strategy was a winning approach. Indeed, the Dutch fleet had no a precise organization and was divided into several small squadrons, each under a different commander. Their tactic was to engage the enemy in a one-to-one fight and conquer the ship. Differently, the English fleet was perfectly organised. The hierarchy among officers was clear, warships were divided in three large squadrons and were sailing perfectly in line.[22] Thanks to the line strategy, as well as better sailing qualities ships, the English won the battle but the Dutch learned their lesson.

The admiral Michiel Adriaenszoon de Ruyter (1607 – 1676) was the one who promoted a reorganization of the Dutch fleet. Following the English example, he divided the fleet it in only three squadrons and imposed the line of battle as strategy. De Ruyter had his chance to prove the rightness of his decisions just one year after the defeat against England. On the 11th of June 1666 (N.S.), the Dutch fleet was once again challenging the English. This time both the fleets were fighting in line, and the De Ruyter defeated the English force captained by admiral George

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[20] J.C. LEMINEUR, *Ibidem,* pp. 29-30.

[21] J.R. DULL, *The Age of the Ship of the Line. The British and French Navies, 1650-1815*, Lincoln and London, University of Nebraska Press, 2009.

[22] G. ROMMELSE, *The Second Anglo-Dutch War (1665-1667)*, Hilversum, Verloren, 2006, pp. 130-132.

Plate n.13 of: Paul Hoste, *L'art des armées navales, ou Traité des évolutions navales*, Lyon, Anisson, & Posuel, 1697, source: gallica.bnf.fr / Bibliothèque nationale de France. In the text, the plate is claimed to be a representation of the battle of Texel but according to the date reported (13th of June 1665) and the description of the battle, it is more likely to be the battle of Lowestoft.

Monck.[23] Soon, France adopted the line of battle, and among its admirals, the one who succeeded the most in this strategy was probably Abraham Duquesne (c. 1610 – 1688).[24] In the second half of the 17th century, all the main sea battles were fight according to the line of battle. That was the creation of a new style of battle, still used during the 19th century.

The Stuarts and the navy, the success of the English navy – The English naval power went from being an almost non-existent force to dictating technical and tactic improvements in a relative short time. During the 17th century, this fledgling force grew, eventually becoming one of the major cornerstones of the eighteenth-century British Empire. Its great development was partly due to the increasing interest shown in the navy by the Stuarts sovereigns who succeeded each other on the English throne.

During the reign of James I (1566 – 1625), economic problems did not allowed a real improvement of the navy. Only a few ships were launched each year and the fleet was not even large enough to defend English

[23] G. Rommelse, *Ibidem*, pp. 155-156.

[24] J.C. Lemineur, *Op. cit.,* p. 15.

merchants from piracy in the Channel.[25] Nevertheless, the king showed his interest in naval affairs through symbolic and institutional actions, like naming new ships and attending the launches. He also supported the decision taken by George Villers (1592 – 1628), Duke of Buckingham, Lord High Admiral of the English navy, and tried to expand the fleet and make improvements in its organization.[26] Moreover, during his reign, a colonialist mindset was promoted, leading to the discovery of new routes and consequently the growing of Atlantic trades and the occupation of overseas lands.[27]

After him, Charles I often visited royal fleets and arsenals, both in public events, such as the launch of ships, and in less social occasion, like during inspections. Sometimes the king sailed on ships in their first voyages to test their performances, other times when he could not see new ships by himself, he wanted to be informed about them.[28] After Buckingham's death, in 1628, he assumed a more direct role in the navy. In 1630, he promoted a reform of the Navy Board's body and interceded during the appointment of admirals and captains. He was also interested in ship design, imposing sometimes his decisions about number of guns, dimensions and dates of launches.[29] As James I, Charles I suffered from lack of funds too. In 1634, he decided to impose the Ship Money* and ordered the construction of ten ships between 1634 and 1640.[30] Among them, the *Sovereign of the Seas* shows that he was willing to spend a large amount of money for a single ship; and since that ships was also meant to prove the greatness of the Crown, it suggests that Charles I saw the navy not only as a weapon, but also as a stage suitable for displaying his power.

During the English Civil War (1642-8), the navy supported the Parliament. At the end of the war, the Parliament possessed 72 ships.[31] During the Commonwealth (1649-60), shipbuilding and naval affairs were supported mainly thanks to the sequestered royalist lands[32] and when Charles Stuart became king, England had 157 warships, of which 74 carrying from 30 to 100 cannons.[33] The following Stuarts ascending

Ship Money

Ship Money was a tax that the sovereign could request without the approval of parliament in the event of war to support the expenses of the navy. It was generally levied on the coastal population of England to meet the costs of the fleet. This tax remained active until 1640.

[25] P.M. Kennedy, *The Rise and Fall of British Naval Mastery*, London, Allen Lane, 1976, pp. 38-40.

[26] J.D. Davies, *Kings of the Sea. Charles II, James II & the Royal Navy*, Barnsley, Seaforth Publishing, 2017, pp. 28-30.

[27] P.M. Kennedy, *Op. cit.*, pp. 41-42.

[28] A.D. Thrush, "The Navy under Charles I, 1625-40", University of London PhD thesis, 1990, pp. 33-39.

[29] J.D. Davies, *Op. cit.*, pp. 33-35.

[30] R. Harding, *Seapower and naval warfare, 1650–1830*, London, UCL Press, 1999, p. 62.

[31] *Idem*.

[32] P.M. Kennedy, *Op. cit.*, p. 45.

[33] J.C. Lemineur, *Op. cit.*, p. 27.

the throne of England were even more keen to naval affairs than their predecessors. Both Charles II and James II were skilled sailors, who gladly spent their free time aboard royal yachts. Their passion is also proved by the fact that Charles II drew himself draughts and dimensions of ships, while James II had a collection of ship models. They had an active participation in choices taken by the navy, also regarding ship design.[34] They also tried to involve English aristocracy in the maritime world by promoting the naval career among young nobles.[35] During Charles II's reign, the navy suffer from a great corruption; nevertheless, his willing to maintain a naval supremacy, led him to improve the fleet.[36] Meanwhile, James Stuart became the Lord High Admiral (1660-73) and during his appointment, he often had to endure the intrusions of the brother, who was constantly involved in naval affairs.[37] In 1677, a construction programme for thirty warships was funded by the Parliament; the king attended many of the launches during the following years and frequently visited the arsenals together with his brother.[38] In the same year, a qualifying examination for lieutenants was introduced as a conclusive step in a reform for the officer corps started in 1660s. As well as the Duke of York, one of the advocates of this reform was Samuel Pepys (1633 – 1703), who saw this exam as a solution to the incompetence and ignorance in the naval affairs of some captains.[39] On 24 January 1672, Pepys had become a member of Trinity House, which held the examinations for pilots, and from1674, also for master and commanders of Sixth Rate frigates. In November 1673, following the resignation of the Duke of York as Lord High Admiral, Pepys was appointed Secretary of the Admiralty Commission, being at the head of the Navy.[40] The two brothers shared the same wish to make England the first naval power of Europe and World, and they promoted not only naval improvements and reforms but also voyages and explorations, as well as planing naval campaigns to contrast enemy powers.[41] When James became king in 1685, his care about naval affairs did not die. During his reign (1685-88), he started a reform of the fleet as well as the body of the Navy Board, initially entrusting Pepys with the planning of a programme, and James II proposed the introduction

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[34] J.D. Davies, *Op. cit.*, pp. 66-70.

[35] *Ibidem*, p. 127.

[36] P.M. Kennedy, *Op. cit.*, p. 58.

[37] J.D. Davies, *Op. cit.*, p. 100.

[38] *Ibidem*, pp. 55-63 and 68.

[39] *Ibidem*, pp. 141-148.

[40] N.J.W. Thrower, "Samuel Pepys FRS (1633-1703) and the Royal Society", in *Notes and Records of the Royal Society of London*, Vol. 57, No. 1, Jan., 2003, pp. 3-13.

[41] Cfr. J.D. Davies, *Op. cit.*, pp. 186-188 and 194-197.

of inspectors who had to scrutinise the work of the Navy Board.[42] The interest and the care of Stuarts kings should not be forget when studying the rise of the English naval power.

The rise of the French navy

Although England was one of the first powers to develop ship design in the 17th century, it was not the only one. Despite starting with little bit of delay, France became a great naval power in the second half of the century. This rapid upswing was possible especially thanks to Jean-Baptiste Colbert (1619 – 1683), eager to make France a naval power. Colbert was a disciple of the prime minister the Cardinal Jules Mazarin (1602 – 1661), in charge since 1643 until his death. Shortly before he died, Mazarin sent a letter to Louis XIV (1638 – 1715) writing:

«Je vous dois tout, Sire; mais je crois m'acquitter en quelque manière en vous donnant Colbert.»[43]

«I owe you everything, Sir; but I believe I am acquitting myself in some way by giving you Colbert.»

And so it was that in the 1661 Jean-Baptiste Colbert became *Principal Ministre d'État* (1661). Having this role was equivalent to being the main adviser to the King, thus giving him great power. Moreover, he also became Controller-General of Finances (1665), as well as Secretary of State of the Navy (1669). That meant that Colbert had the assignment to organise and manage the French navy that was in critical condition. The Cardinal Richelieu, who had been prime minister before the Cardinal Mazarin, had made many efforts in order to strengthen the navy. In 1626, he had also create the title of *Grand-Mâitre de la Navigation* in order to remove the navy from the aristocracy control and putting it directly under the king control.[44] Furthermore, in the 1630s, he pushed for the development of the shipbuilding of large vessels; in particular in 1629 he ordered the shipwright Charles Morieu to build the *Couronne* (1636). She was one of the biggest vessels of her time, 165 feet long (50.3 metres) and boarding 20 heavy guns and others light ones, for a total of 72 guns.[45]

After Richelieu, Mazarin continued to promote the development of shipbuilding in the area. Among the various Dutch shipwrights who immigrated to France at the urging of the cardinal, there was Rodolphe

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[42] *Ibidem*, pp. 220-221.

[43] C. de La Roncière, *Histoire de la marine française*, Vol. 5, Paris, E. Plon Nourrit, 1899, p. 312.

[44] A. James, *The Navy and Government in Early Modern France, 1572-1661*, Woodbridge (UK), Boydell & Brewer, 2004, p. 55.

[45] L. Paine, *Warships of the World to 1900*, Boston and New York, Houghton Mifflin Harcourt, 2000, p. 43.

Gédéon (Unk – 1672), who moved in 1645 and was active at the Toulon shipyard;[46] his skill was such that he was entrusted with the construction of the flagship of the Mediterranean fleet. Nevertheless, all these efforts had been nullify under the regency of Anne of Austria (1601 – 1666), *Grand Maitrise de la Navigation*[47] from 1646 to 1650. In 1661, one of the first operations that Colbert made regarding the navy, was an inquiry which showed the state of neglect of the French fleet. Colbert himself commented:

> «Depuis dix ans l'on n'avait jamais vu en mer plus de deux ou trois vaisseaux de guerre François; tous les magasins de guerre étaient entièrement dénués; tous les vaisseaux réduits à vingt, – plusieurs mesme hors d'estat de servir, – toute la chiourme à huit on neuf cens forçats, la pluspart malades et affoiblis; six meschans corps de galeres; enfin cette nature d'affaires en laquelle reside la mailleure partie de la gloire du prince et le respect de son nom dans les pays estranders, reduite au plus pitoyable estat que l'on puisse imaginer.»[48]

«For ten years no more than two or three French warships had been seen at sea; all the stores of war were entirely destitute; all ships reduced to twenty, – several even unable to serve, – the whole crew to eight or nine hundred convicts, most of them sick and weakened; six poor galleys; finally that nature of business in which resides the greatest part of the glory of the prince and the respect of his name in foreign countries, reduced to the most pitiful state that one can imagine.»

A further inquiry made in 1664 showed that the French navy was seriously outnumbered compared to the foreign powers. The French fleet was composed by about 130.000 tons while the English one by 200.000 tons, almost twice the French fleet; the Dutch fleet was even more than the double with its 600.000 tons.[49] To solve the problem, Colbert had firstly to restart shipbuilding. He called back in France many French shipbuilders who had moved abroad[50] and also drew many shipwrights from foreign countries, especially Italy and Netherlands. Doing this, Colbert let the French shipyards learn the Dutch shipbuilding technique, which was considered one of the best of that time. To get a numerous fleet as soon as possible, the prime minister started a local ship production as well as several negotiations to buy ships from Italy, United Provinces (1581-1795), Denmark and Sweden. Louis XIV declared himself opposed to the purchase of foreign ships, rather inclined to build them on the territory. However, in the mid-seventeenth century, it was essential for France to turn to foreigners to implement the fleet, not having yet an adequate arsenal apparatus.[51] In 1666, Colbert sent the Captain Jub Forant (1612 – 1692) to Amsterdam to buy six second-rate vessels and

[46] J. Boudriot, *Le vaisseau Trois-Ponts du Chevalier de Tourville*, Paris, Collection Archeologie Navale Française, 1998, p. 10.

[47] P. Chack, *Marins à bataille*, Vol. 1, Le gerfaut, 2001, p. 169.

[48] C. de La Roncière, *Op. cit.*, p. 325.

[49] T. Sarmant, *Louis XIV: homme et roi*, Paris, Édition Tallandier, 2012.

[50] M. Stoll, T. Sarmant, *Le grand Colbert,* Paris, Édition Tallandier, 2019.

[51] A. Anthiaume, *La Navire. Sa construction en France et principalement chez les Normands*, Paris, Librairie Ernest Dumont, 1922, p. 227.

also to order about a dozen new ships.[52] Along with Forent, Colbert sent in Holland the Commissaire Général de la Marine at Hauvre Dumas with the task of carefully studying the ships that the Dutch offered. These six vessels were the *Conquérant*, the *Courtisan* (*Magnifique* from 1671), the *Invincible*, the *Normand* (*Saint-Louis* from 1671), the *Intrépide* (*Grand* from 1671) and the *Neptune* (*Illustre* from 1671); they were sent to France on 5 May 1667.[53] Competition between the maritime forces forced them to require a great deal of effort from the arsenals. Confrontation with rivals was fundamental, as the idea of being inferior to foreign forces was unacceptable. When in 1669 the superintendent of Toulon Louis Leroux d'Infreville (1642 – 1712) informed Colbert that the arsenal of Toulon could only launch five ships a year, the minister's concern was immediately directed to the reaction of the other powers. Indeed, his answer was:

«Il est certain que les Anglois et Hollandois se moquent de nous».

«Certainly English and Dutch make fun of us».

being them able to build

«dix, douze vaisseaux en trois ou quatre mois de temps».[54]

«ten, twelve ships in three or four months».

Furthermore, France still relied on foreign shipwrights for local construction as well. In a letter dated 22 February 1669 to Charles-Jean Colbert (1628 – 1684), known as Colbert de Terron, intendant in the arsenal of Rochefort, the minister discussed the need to bring other Dutch shipwrights to work in France. In the letter, the minister said he was sorry that despite all the ships built in France, and despite all the efforts to promote shipbuilding, it was still necessary to rely on foreign builders, as

«nous n'ayons pu accoustumer les charpentiers françois à servir le Roy avec autant de liberté et de volonté que les marchands».

«we could not accustom French carpenters to serve the King with as much freedom and will as mercenaries».

Colbert also tried to find a silver lining. Indeed, in the same letter he also wrote:

«Si nous avons un bon maistre charpentier hollandois, il donnera un bon exemple pour l'économie et le mesnage des bois; en quoy les Hollandois

«If we have a good Dutch master carpenter, he will set a good example for economy and management of wood; in which the Dutch...

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[52] P. Clément, *Lettres instructions et mémoires de Colbert,* Tome III, part 1 – Marine et galere, Paris, imprimerie impériale, 1864, pp. 34-36.

[53] R. Winfield, *French Warships in the Age of Sail 1626-1786 - Design, Construction, Careers and Fates*, Barnsley (UK), Seaforth Publishing, 2017, pp. 81-82.

[54] P. Clément, *Op. cit.*, p. 103.

> sont constamment plus habiles que nous [...]»[55]

...are constantly more skilful than us [...]»

In addition to providing quality labour and being a great builder from which to buy ships, the Republic of the Seven United Provinces was also seen as a valuable example for the improvement of French shipbuilding. Indeed, the French monarchy sent men to Dutch territory trying to steal the secrets of their construction. Among these men, Thomas Gobert (c. 1630 or 1640 – c. 1708), engineer and architect of Louis XIV, was sent to the Dutch Republic to draw up a plan of all ports, dams, piers and other maritime structures.[56] A few years later, Étienne Hubac (1648 – 1726), was sent to the republic to acquire information on:

> «[...] les mesures et proportions de toutes sortes de vaisseaux, soit de guerre, soit de charge [...]».

«[...] measurements and proportions of all kinds of vessels, whether of war or cargo [...]».

Hubac's task was also to inquire about which machinery they used to lift and move heavy loads and in general to learn everything possible to improve the construction and repair of ships.[57] Similar tasks were assigned to Pierre Arnoul (1651 – 1719) and Jean-Baptiste Antoine Colbert, Marquis de Seignelay (1651 – 1690), who were sent in the 1770s to the republic with precise instructions to acquire as much information as possible on Dutch shipbuilding.[58]

Colbert also focused his attention on the facilities needed by shipbuilding. He expanded the main existing ports such as Brest, Toulon, and Marseille, and started the construction of new arsenals, like Rochefort (1666). The aim was also that to create shipyards on the whole coast. For this reason, shipyards were spread all over the France; Brest, Port-Louis,

Pierre Puget, *Dessein de la ville de Toulon, et partie de son Arsenal, du costé du Levant*, 1676, Bibliothèque nationale de France, département Cartes et plans.

[55] *Ibidem*, pp. 100-101.

[56] *Ibidem*, p. 36.

[57] *Ibidem,* p. 199.

[58] D. Dessert, *La Royale, vaisseaux et marins du Roi-Soleil*, La Flèche, Fayard, 1996, pp. 130-138.

and Rochefort were on the Atlantic coast, Dunkerque on the North Sea, while Marseille and Toulon were on the Mediterranean Sea. Not only shipyards were developed but also shipbuilding, ship control, management schools, and naval artillery practice, as well as guns foundries.[59] Regarding foundries, Colbert had to create an "industry" out of nothing. Indeed, although some French guns foundries successes in the 16th century, the political crisis lived by the Reign had lead to the vanishing of this industry. Even Richelieu did not deal with guns construction, and when Colbert took charge, France completely depended on foreign armaments, especially Dutch ones. He was firmly convinced of the need to create a national iron armament industry to develop a internal trade and exploit French iron mines. Thus, from the 1660s a national plan was implemented. It included the extraction and transport of minerals in carefully selected centres to supply all arsenals, and the birth of large private companies for the processing of raw materials was stimulated. Despite that, results were not satisfactory because of the unsuitable quality of French iron for casting, and France did not develop a powerful iron armament industry until the second half of the 18th century, long after Colbert died.[60]

Except for the failure in guns production, other naval operations were successful. When the Dutch war (1672-1678) broke out, France had 120 ships of the line[61] and in 1676 it won a naval battle at Palermo against the Dutch fleet supported by Spain. On that occasion Louis XIV wrote to Colbert:

> «(...) Voilà ce que nous souhaitions il y a longtemps vous et moi et il n'y a plus rien à désirer de ce côté-là. Il faut toujours travailler à perfectionner ce qui commence déjà à passer les autres nations. Il faut faire en sorte que la France l'emporte par mer sur les autres nations comme elle le fait sur terre.»[62]

«This is what we wanted a long time ago and there is nothing more to be desired about it. We must always work to perfect what is already beginning to pass other nations. We must ensure that France prevails by sea over other nations as it does on land.»

In 1690, the French Navy had almost 150 ships. Three of them were classified as *première grandeur* ships with 120 guns; these were the *Soleil Royal* (1669), the *Royal Louis* (1668) and the *Dauphin Royal* (1668). In the fleet there were also 30 second-rates mounting 70-90 guns, 60 third-rates carrying 50-70 guns and 30 galleys exclusively used in the Mediterranean Sea.[63] The Roi Soleil was satisfied of Colbert's results and, after a trip to the shipyard at Dunkerque, in 1680, the he wrote to his minister a letter saying:

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[59] T. SARMANT, *Op. cit*.

[60] C.M. CIPOLLA, *Op. cit.*, pp. 35-39.

[61] T. SARMANT, *Op. cit.*

[62] I. MURAT, *Colbert*, Paris, Fayard, 1980, p. 336.

[63] T. SARMANT, *Op. cit*.

> «J'entendrai bien mieux présentement les lettres de marine que je ne faisais, car j'ai vu le vaisseau de toutes manières et faire toutes les manoeuvres tant pour le combat que pour faire route. Je n'ai jamais vu d'hommes si bien faits que sont les soldats et les matelots; si je vois jamais beaucoup de mes vaisseaux ensemble, ils me feront grand plaisir. Les travaux de la marine sont surprenants, et je ne m'imaginais pas les choses comme elles sont: enfin je suis satisfait.»[64]

«I will understand letters about navy much better now than I did, for I have seen every kind of ship and all the manoeuvres used for combat and sailing. I have never seen such well-made men as soldiers and sailors;if I ever see many of my ships together, they will give me great pleasure. The work of the navy is surprising, and I did not imagine things as they are: finally I am satisfied.»

Certainly, France was in a different situation from England, where sovereigns were passionate about navigation and the navy. Conversely, neither Louis XIV nor Colbert had knowledge of the naval world. However, thanks to the dedication of the prime minister, France managed not only to become one of the major naval powers of the 17th century but it set itself as a reference model for foreign shipbuilding in the following century.

The small-size Dutch Republic's fleet

In the 17th century, Dutch shipbuilding had long since proved its mastery in the construction of large ships. An example is the *Hollandsche Tuyn*, or *Hollandsche Tuin*, a 4-masted 1000-tonne (500 *last*)[65] vessel launched in 1598, equipped with about 50 guns. She was built in Amsterdam and immediately entered service under the admiral Pieter van der Does (1562 – 1599) on an expedition to the Canary Islands in 1599. In 1606,

Loef, Jacob Gerritz, *A Warship, built in 1626 by order of Louis XIII in a Dutch shipyard, Arriving at a Dutch Port under Guidance of a Dutch Ship*, 1626 - 1635, Rijksmuseum, Amsterdam.

[64] *Ibidem*.

[65] For more details on the last, look in the editorial notes.

she was sold to the Duke of Florence Ferdinando I de 'Medici (1549 – 1609), as she was not suitable for navigation in the Dutch shallow coastal waters.[66] Large-scale Dutch shipbuilding was also appreciated abroad. This is demonstrated by the construction of the *Grand Saint Louis* (1626), with a tonnage of 1000 tons and equipped with 55 guns. She was built by the Dutch shipwright Lambert in the Amsterdam shipyard for Charles of Guise (1571 – 1640), commander of the French fleet in the Mediterranean.[67]

Nevertheless, while the other European navies made of the large vessels their main and highly decorated weapon, the Dutch navy always preferred using smaller-size vessels and with a restrained decoration. To understand the reasons of this choice, it is necessary to take into consideration two factors, the geography and the political condition, which were both deeply different from the European Monarchies of that time. Firstly, the Dutch coast is characterized by shallow waters, particularly near harbours, which does not allow ships with a deep draft to navigate. For this reason, Dutch ships designed to navigate and defend the neighbouring waters needed to be small and with little draft. Secondly, the political situation should be considered. After the revolt against the Spanish dominion, which had began in 1566, the Netherlands separated from Belgium and Luxembourg, which remained under the Habsburg control, and formed the Republic of the Seven United Provinces (1581-1795). This reality was a political exception when compared to the powerful monarchies ruling in the other states. Even the management of the Koninklijke Marine (the Royal Dutch Navy) represented a *unicum*, not being subjected either to an authoritarian figure, such as Colbert for the French fleet, or to an elite, as it was the English Navy Board created by Henry VIII in 1546. During the Dutch rebellion, the small private fleets of coastal cities, born under the example of the pirate fleet led by William of Orange (1533 – 1584) known as *Watergeuzen*, played a fundamental role in countering the Spanish power. From 1573, a new navy was created and in 1576 the command was entrusted to William of Orange. With the birth of the Republic (1581), the States General assumed the position of general management body, capable of determining the strategies to be followed in an organic way. Subsequently, a Ministry of the Navy based in Rotterdam was created, but the centralization process proved complex and slow. The navy was then organized into five admiralties. They were the Admiralty of the Maas (1574) in Rotterdam, the Admiralty of Zealand based in Veere, the Admiralty of Amsterdam (1586), the Admiralty of the North Quarter

[66] B. de Groot, *Dutch Navies of the 80 Years' War 1568-1648*, London, Bloomsbury Publishing, 2018, p. 18.

[67] B. Landstrom,*The Royal Warship Vasa*, Stockholm: Interpublishing, 1988, pp. 34-35.

(Noorderkwartier) of the province (1589) with alternate headquarters between Hoorn and Enkhuizen, and finally the Admiralty of Friesland (1596) established first in Dokkum, and then in Harlingen (1645). In 1597, a system of Admiralty Colleges was established, thus making the admiralties administrative bodies responsible for implementing the decisions taken.[68] Thus, Dutch shipbuilding did not follow the decisions of a monarch but aimed solely at creating vessels that could meet the requirements of seaworthiness, and it was thus based on practical needs relating to the precise geographical context. Indeed until the 1590s, Dutch warships generally had a tonnage of about 100 tons, and only a few vessels exceeded 200 tons.[69]

In 1596, the alliance with England and France put the republic in comparison with the great monarchies. The inadequacy of the Dutch fleet was particularly evident during the Anglo-Spanish War (1585-1604), when England asked its new ally to send a contingent of 24 ships to participate in three convoys bound for Spain, in the undertaking known as the Capture of Cádiz (30 June – 15 July 1596). Of the three convoys, respectively of 100, 150 and 200 vessels, the Dutch admiralties participated with only 6 ships, while the other 18 had to be rented from private individuals. Furthermore, the agreement was for 8 of 200 last,[70] 8 of 150 and 8 of 100, but they were able to supply only three large ships. The Admiralty of the Maze had only two ships, and the Noorderkwartier just one ship, all three of 100 last. The council of Zeeland contributed two large ships of 200 last, the *Aeolus* (1595) and the *Neptunus* (1593). The largest ship of the fleet belonged to the Admiralty of Amsterdam; she was the *Neptunus* (1594) of 250 last, which was captained by Admiral Jan van Duvenvoorde (1547 – 1610) known as Lord Van Warmont.[71] The *Neptunus* had a crew of 120 people, a length of 102 feet (31.1 m), a width of width 33 feet (10.1 m) and a draft of 13.5 feet (4.1 m).[72]

On the whole, Dutch ships were smaller than English and Spanish ones.[73] The ships of the English crown included the flagship *Ark Royal* with 55 guns reaching 555 tons bm, commanded by Lord High Admiral

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[68] K. Davids, M.'t Hart, "The navy and the rise of the state. The case of the Netherlands c.1570-1810", in J. Backhaus, N. Kyriazis, N. Rodger (Eds.), *Navies and State formation. The Schumpeter hypothesis revisited and reflected,* Zurich, LIT Verlag, 2012, pp. 273-316.

[69] J. Bender, *Dutch Warships in the Age of Sail - 1600-1714 – Design, Construction, Careers and Fates*, Barnsley, Seaforth Publishing, 2014.

[70] For more details on the last cf. the editorial notes.

[71] J.E. Elias, *De vlootbouw in Nederland in de eerste helft der 17e eeuw, 1596-1655*, Amsterdam, Noord-Hollandsche uitgeversmaatschappij, 1933, pp. 8-9.

[72] Dimensions given according to the Maritime Stepping Stones (MaSS), initiative of the International Programme for Maritime Heritage of the Cultural Heritage Agency of the Netherlands (RCE). Website: https://mass.cultureelerfgoed.nl/neptunus-1594

[73] M. Russell, *Visions of the Sea: Hendrick C. Vroom and the Origins of Dutch Marine Painting*, Leiden, Brill Archive, 1983, p. 210.

Charles Howard, 1st Earl of Nottingham (1536 – 1624), and other vessels of new construction. The *Ark Royal* was and old construction; she had a length of 103 ft (31 m), a width of 37 ft (11 m) and a depth of hold of 16 ft (4.9 m). Among the other new-built ships, there was the *Warspite* (1596) carrying 29 guns, with a tonnage of 648 tons bm, the *Repulse* (1596) armed with 50 guns, of 622 tons bm and the *Merhonour* (1596), with 41 guns, commanded by Vice Admiral Lord Thomas Howard (1511 – 1537). The latter ship was the largest of the English fleet reaching 692 tons bm.[74] She was of 110 feet (33.5 m) long, 37 feet (11.3 m) wide, and her depth in hold was 17 feet (5 m). For the Spanish galleons, 500 tons of burden had been common since the 1570s, and they came to build galleons from 800 to 1000 tons.[75]

Therefore, the Dutch fleet needed to be rapidly increased, trying to raise

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[74] R. Winfield, *British Warships in the Age of Sail 1603-1714 - Design, Construction, Careers and Fates*. Barnsley, Seaforth Publishing, 2009.

[75] A. Konstam, *Spanish Galleon 1530-1690*, Oxford, Osprey Publishing Ltd, 2004, p. 7.

Aert Anthonisz (Aert van Antum), *The Battle of Cadiz* (Dutch and English Ships Attack the Spanish Armada), 1608, Rijksmuseum, Amsterdam. In the background on the left, the Dutch ship is clearly smaller than the two ships in the foreground.

the average tonnage of ships to 300 tons. Among the newly built ships, there was the *Orangieboom* (1596) of 150 last,[76] captained by the Admiral Jacob van Wassenaer Duivenvoorde (1574 – 1623). This ship immediately attracted general attention for her excellent sailing qualities, so much so that at the end of 1597 two well-known merchants from Rotterdam, Jan van der Veken and Pieter van der Hagen, asked the college to transfer the ship for a voyage to Japan with the aim of establishing a commercial route to the East Indies.[77] The request was denied, as the admiral declared that they could not lose the best ship in the entire fleet. Two years after the Battle of Cadiz, Henry IV of Bourbon (1553 – 1610), who had become king of France, signed the peace of Vervins (2 May 1598) with Spain. That meant that France had become a new enemy from whom the republic had to defend their trade. For this reason, the States General decided to build

[76] J.E. Elias, *Op. cit.*, p. 8.

[77] B. Kaplan, M. Carlson, L. Cruz (Eds.), *Boundaries and their Meanings in the History of the Netherlands*, Leiden, Brill, 2009.

Verbeeck, Cornelis, *A Naval Encounter between Dutch and Spanish Warships*, c. 1618-1620, National Gallery of Art, Washington.

four large tonnage "schepen van geweld" (ships of violence), the largest of which was the *Hollandsche Tuyn*. Still in the summer of 1600, the republic decided to focus on large ships, but the main concern remained that of maintaining excellent navigation skills. The state ordered Zeeland, known for the good quality of its ships, to send the papers with the specifications of ships; at the same time, the Admiralty Colleges were ordered not to start any construction until a model was sent to them to follow. A second push towards the construction of large ships came in the 1620s, although the results showed that these vessels were not suitable for the conditions off the Dutch coast, and so they were transferred to the VOC (Verenigde Oostindische Compagnie, i.e. "United East India Company"). For the next thirty years, Dutch ship design focused on ships from 300 to 700 tons. Thus, towards the middle of the 16th century, the Netherlands still had a fleet of smaller vessels than other European powers.[78]

The Dutch approach to shipbuilding reveals that efficiency was the aim pursued. The choices made prove that the desire to show themselves on a par with other European powers was related to the effectiveness of their navy and did not allow itself to be overwhelmed by the race towards the construction of huge and majestic ships. For example, at the end of the 16th century, the States General decided to sell the *Hollandsche Tuyn* and her twin *Leeuw* (1601), despite being the largest ships of the fleet, which were moored unused respectively in the ports of Amsterdam and Rotterdam.[79] Nevertheless, although the inferiority in dimension and firepower of Dutch warships, it will be the Dutch Republic one of the main protagonists to triumph in the 17th century.

Moreover, the fact that Dutch navy did not have large warships does not mean that the Dutch Republic did not owned large ships at

[78] J.E. Elias, *Op. cit.*, 1933.

[79] *Ibidem*, pp. 9-17.

all. Larger ships were built for commercial purposes, and warships that proved too large were reassigned to trade routes as merchant ships. The Dutch intensified overseas traffic, mostly depriving the Portuguese of many areas of influence. In particular, the Republic of the Seven United Provinces created in 1602 the VOC to which it attributed the monopoly of commercial activities in the colonies in Asia. And in 1621, the Dutch West India Company gained a monopoly on the West Indies trade. Having to sail overseas routes, these companies needed larger vessels. Over the course of the century, the Dutch Republic grew into a colonial empire during a period that came to be known as the Dutch Golden Age. Therefore, if the navy fleet relied on smaller ships, the same cannot be said for the Dutch merchant fleet.

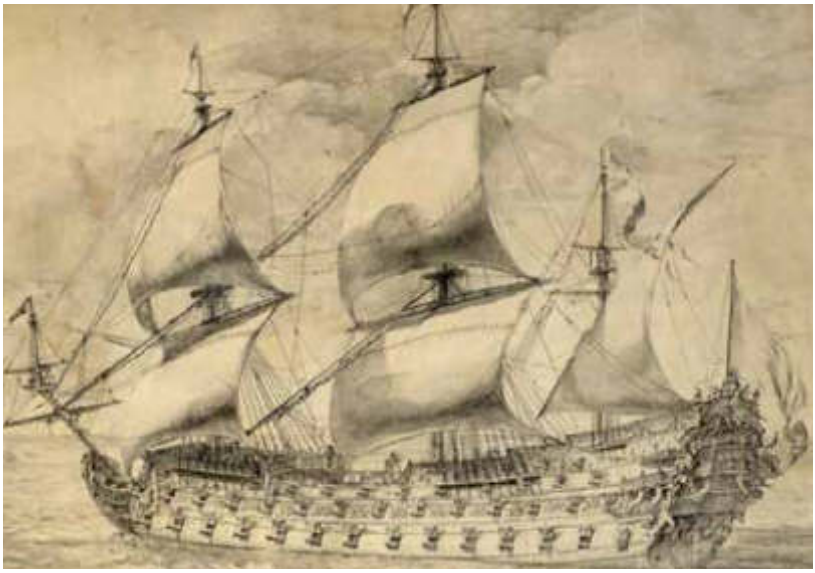
A Japanese painting of a ship of the Dutch East India Company, Nagasaki School, 1782.

Comparison between fleets

Throughout the 17th century, Dutch fleet consisted of smaller vessels compared to other European powers. This can still be seen at the end of the century from the confrontation between the flagships of the three states which participated in the Hague conflict (1692), during which the Anglo-Dutch force clashed with the French fleet. They were the French *Soleil Royal*, the English *Britannia*, and the Dutch *Prins Willem*. Comparing dimensions and other data about the three flagships, it appears that the French ship was much deeper than the Dutch one, and was the largest. The English was actually a middle. Remarkable differences can be seen in the number of guns and man on board. Both the English and the French had reached the threshold of one hundred guns, while the Dutch flagship carried 92 cannons. Moreover, while English and French flagships were three-deckers, the *Prins Willem* only had two gun decks. As for the number of men aboard, English and French ships had more than eight hundred people, while the Dutch ship needed about five hundred men.

French flagship *Soleil Royal* (1671),[80] Admiral Anne-Hilarion de Costentin, Comte de Tourville (1642 – 1701)

- Length = 53 m
- Beam = 14 m
- Depth = 7 m
- Armament = 104 guns
- Crew = 836 men



Pierre Puget, *The "Royal Louis"*, Albertina Musuem, Vienna. Picture available in the online collections at the permanent link: https://sammlungenonline.albertina.at/?query=search=/record/

[80] R. WINFIELD, *Op. cit.*, 2017.

English flagship *Britannia* (1682),[81] Admiral Edward Russell (1653 – 1727)

- Length = 41,45 m
- Beam = 14.5 m
- Depth = 5.2 m
- Armament = 100 guns
- Crew = 780 men

Detail of: Isaac Sailmaker, *HMS 'Britannia' in Two Positions*, late 17th century, National Maritime Museum, USA.

Dutch flagship *Prins Willem* (1688),[82] Admiral Philips van Almonde (1644 – 1711)

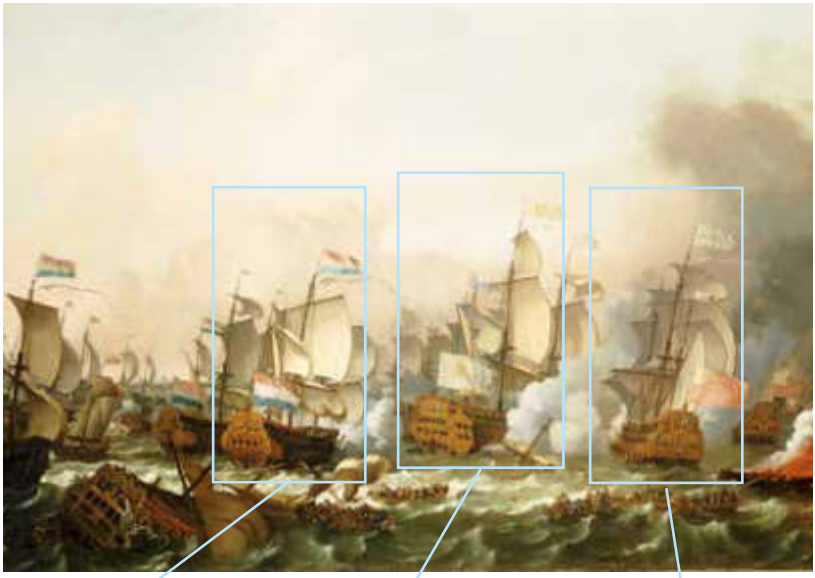
- Length = 48 m
- Beam = 12 m
- Depth = 4.5 m
- Armament = 92 guns
- Crew = 525 men

Detail of: Ludolf, Bakhuizen, *The Battle of Barfleur*, 19 May 1692. National Maritime Museum, London.

[81] R. Winfield, *Op. cit.*, 2009.

[82] J. Bender, *Op. cit.*

Dutch shipbuilding also differed in its construction methodology, that was based on the Northern European tradition. This involved a different hull setup. Indeed France and England followed the Mediterranean method called "skeleton-first", in which the basic structure (keel and ribs) was first set up and then planking was fixed. Instead, the Dutch proceeded by setting the keel and immediately placing the planking of the bottom, on which the ribs were inserted.[83] Secondly, the shape of Dutch hulls was different from that of foreigners. The reason for this diversity must be sought mainly in the local geographical conditions; since shallow waters do not allow ships with a deep draft to navigate, not only the dimensions



Ludolf, Bakhuizen. *The Battle of Barfleur*, 19 May 1692. National Maritime Museum, London.

Details of the previous painting. From right to left: Dutch, French and English warships.

[83] B. LANDSTROM, *Op. cit.*

had to remain contained but also sections had to be composed of rather flat floors, decisively distinguishing itself from the curved shapes of the French and English hulls. Furthermore, even the weight was contained, for example, through the 'use of wooden rivets on most of the joints and reserving the iron nails for the most critical parts; this method was also in stark contrast to the French construction which involved the use of a robust and heavy framework fixed almost completely by iron elements.[84]

These differences were already known at that time. This is particular clear thanks to some French reports made during the 1670s. Indeed, despite having larger and more powerful ships, French looked at foreign shipbuilding to solve their ship design problems. The two reference states were England and the Dutch Republic, where Minister Colbert sent his councillors Étienne Hubac, Pierre Arnoul and the Marquis de Seignelay. All reports stated that Dutch and English hulls were longer and narrower, while the French had developed larger, sturdier and heavier vessels. Being heavier meant that rounded and deeper floor timbers were needed in order to slice through water more easily in order to increase the speed. However, deep draughts was combined with high castles, which generated a significant lurch. In 1671, Colbert sent another of his councillors to investigate on English and Dutch Navies. This time, the person sent was Jean-Louis Girardin de Vauvré (1647 – 1724), the naval intendant from 1680 to 1716. In accordance with the other reports, he said that Nordic vessels were lighter and faster and thus, in his opinion, better than French ones. Captains and officers ignored the critics on French shipbuilding, while the strongest reaction came from shipwrights, especially from Brest and Toulon. They could not admit the superiority of foreigner navies and took up the cudgels for French shipbuilding. On the 13th of September 1673, Colbert enacted an Establishment about shipbuilding, which aimed to homogenate French vessels with foreign ones. It also provided for a reduction of decorations and the abolition of galleries in the stern. However, given the hostility showed especially by shipwrights, shipyards did not adopt these rules quickly. Moreover, when the Establishment was issued, the French Navy was mostly composed of newly built vessels. Considering that the average life of vessels was between 15 and 20 years, France had to wait for the last decade of the 17th century to have the new generation of vessels.[85]

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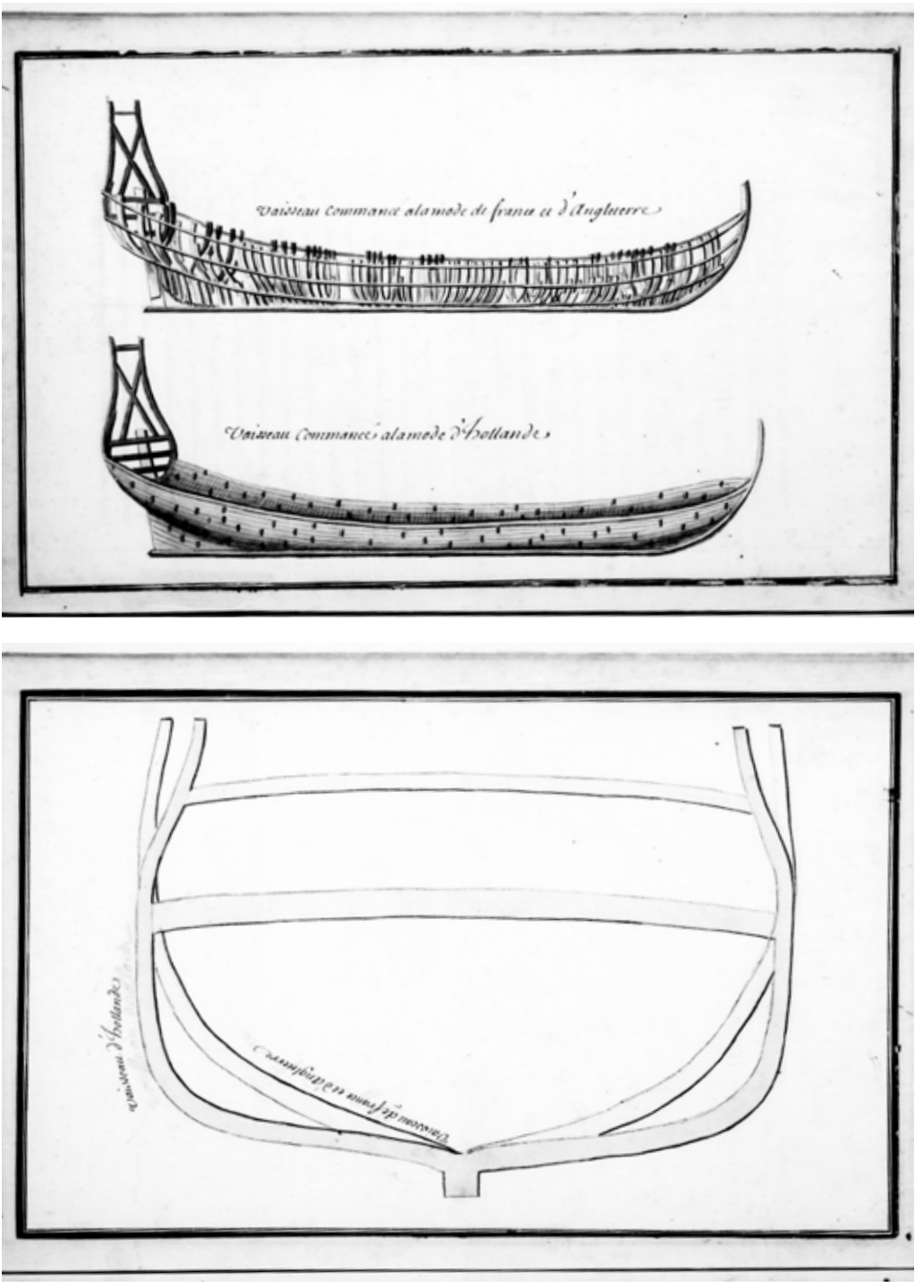
[84] P. Arnoul, *Remarques faictes par le sieur Arnoul sur la marine d'Hollande et d'Angleterre*
dans le voyage qu'il fit en l'année 1670, par ordre de Monseigneur Colbert, manuscript, 1670.

[85] D. Dessert, *Op. cit.*, pp. 144-146.



Pictures above: comparison between British and Dutch shipbuilding. In: Pierre Arnoul, *Remarques faictes par le sieur Arnoul sur la marine d'Hollande et d'Angleterre dans le voyage qu'il fit en l'année 1670, par ordre de Monseigneur Colbert,* manuscript, 1670, preserved at the National Library of France.

Always looking at French shipbuilding, it is clear how influences were part of 17th century ship design. Indeed, many foreigner shipwrights worked in France, such as the Dutch Rodolphe Gédéon (Unk – 1672), who had been employed at Toulon's arsenal since 1645.[86] France had a tradition of heterogeneous shipbuilding. On the Atlantic coast, shipwrights built narrower hulls, which often needed to be broadened, while vessels built in the Mediterranean area were larger with more curvilinear shapes, which meant that those ships were not adequately supported in rough seas. When standardization became a key factor, Colbert tried to reduce these differences. Already from the 1660s, he hired foreigner shipwrights, especially from the Netherlands, so that they could teach their art to local carpenters. Since the 1670s, he moved shipwrights from one arsenal to another in order to spread their knowledge throughout France.[87] In 1669, François Pomet, who was trained by Gédéon,[88] went from Toulon to Rochefort, Jean-Pierre Brun, who had probably studied English shipbuilding in England,[89] moved to Brest from Rochefort; the Italian Blaise Pangolo (1650 – 1714 or 1719) worked at Brest and Toulon, and the Dutch shipwright Voon was at Le Havre in 1672 and Rochefort in 1679.[90] The Mediterranean tradition prevailed on the western one. The Flemish shipwright Hendrik Houvens (Unk – 1690)[91] and his son used a Nordic construction technique but when Hendrick died, his son was replaced by René Levasseur (1667 – 1727) from Toulon, and the Nordic technique ceased.[92] France looked also at English shipbuilding. Louis XVI tried to hire Anthony Deane (1633 – 1721), who was one of the best English shipwrights of that time. However, the Sun King received negative answers and the best that he could obtain from his cousin Charles II, in the name of the Anglo-French alliance, was that Dean built two small yachts for the pleasure of French nobility.[93]

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[86] J. Boudriot, *Op. cit.*, p. 10.

[87] O. Chaline, *La mere et la France. Quand les Bourbons voulaient dominer les oceans*, Lonrai, Flammarion, 2016, pp.241-242.

[88] M. Acerra, "Les constructeurs de la marine (XVII°-XVIII° siecle)", in *Revue historique*, M.G. Monod and G. Fagniez (Eds.), Paris, Presses universitaires de France, 1985, p. 284.

[89] A. Anthiaume, *Op. cit.*, pp.320-321.

[90] M. Acerra, *Op. cit.*, p. 284.

[91] A. Anthiaume, *Op. cit.*, pp. 3129-320.

[92] D. Dessert, *Op. cit.*, p. 84.

[93] *Ibidem*, pp. 81-85.

2. *The European States aesthetic concern in warships*

Flagships as a means of propaganda

According to modern logic, warships can be defined as "functional objects" since their general shape and every single element is designed to be functional. They are the result of changes implemented by a continuous succession of design improvements aiming to increase their efficiency during navigation and especially naval battles. Ornaments are not considered and colours are a consequence of camouflage choices. Nevertheless, it has not always been like that. This idea of warship was probably developing in the 18th and 19th centuries and matured in the ironclads of the second half of the 19th century. Indeed, ironclads were probably the first warships in which decoration was totally banned and the connection with the past was broken, as contemporary sailing warships still had a slight trace of ornament, a faded reminder of the glorious vessels of the previous centuries.

Rewinding the tape of history, it is possible to see that what can be considered obvious nowadays was once far from being so. On the contrary, this process of aesthetic simplification, which led to warships being stripped of any decoration, required two centuries and some remarkable innovations in techniques and materials – mainly the introduction of steam power and iron – to become a reality. But in the 17th century, when warships had just become an incisive weapon for naval battles and states' navies were at their origins, decoration played a central role in the design of warships. In the opposite trend to what its evolution proved to be, ships of the line undertook an increase in decoration compared to their predecessors.

USS Baron DeKalb, an Eads class ironclad, c. 1862, National Archives and Records Administration, Washington D.C.

Thomas Goldsworth, *United States "Auxiliary Screw" steam frigate "Merrimac"*, Published by W. Foster, 114, Fenchurch Street, between 1856 and 1860, Library of Congress Prints and Photographs Division Washington.

Dominic Serres. *Foudroyant and Pégase entering Portsmouth Harbour*, 1782, Art Gallery of South Australia.

Willem van de Velde the Elder, *HMS Woolwich before a light breeze*,c. 1677, Royal Museums Greenwich, London.

Together with the birth of independent naval power and the creation of state navies, ships of the line increased in importance becoming a key factor for supremacy in Europe. As a consequence, warships turned into a symbol of power and greatness of states on the seas, playing a political role of representation. In this sense, their aesthetics became a means of "propaganda", through which show and demonstrate the wealth of a state to foreign powers. This was a great temptation for kings living at the time of the absolute monarchies, who started to expect their warships to be richly decorated with lavish ornaments. Thus, during the 17th century, warships design had to deal with a new emerging aspect, namely decoration. Indeed, the aesthetics of ships of the line became increasingly important, to the point that it was a reason for debates among the figures belonging to the naval world, such as admirals, captains, superintendents of arsenals and shipwrights. Indeed, the accentuation of decorations on board was a challenge for it generated new problems that influenced the entire life of ships, from the construction process to the nautical performance after the launch. At the same time, shipwrights soon had to learn to live with people of a completely different profession, the artists, who became part of the personnel necessary for the construction of ships, and the pragmatism of the technique had to give way to the aesthetic creativity. The decoration was not exclusive to warships, and merchant vessels were adorned too, even if, for the aforementioned reasons, it was more evident in ships of the line. The decoration was present in all ships of the line, and it increased with the rank of the vessel. Being at the head of fleets, flagships were generally the main object of the monarchs' attention, and therefore, they were the most decorated ships.

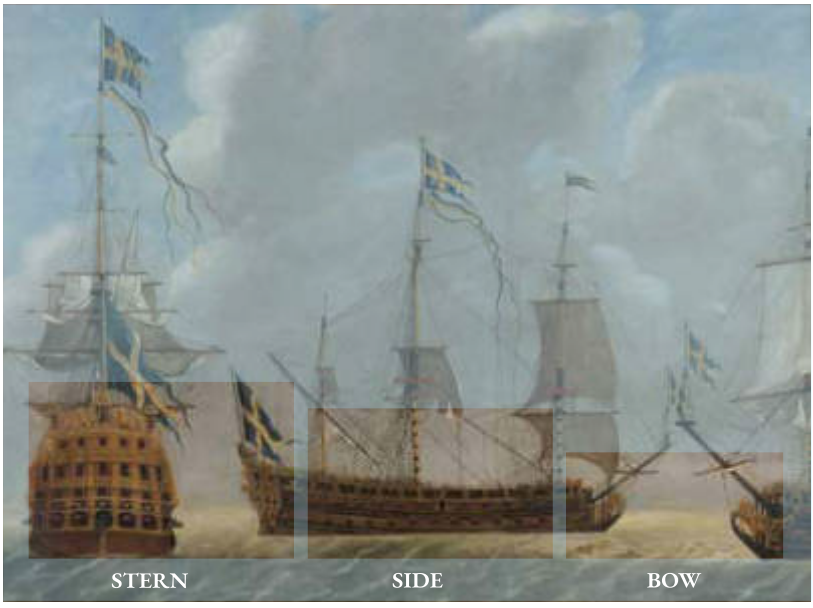
At the beginning of the century, the seduction of aesthetics influenced all the leading European navies. Different approaches to naval decoration evolved over the century; some states decided to reduce decoration in order to increase seaworthiness, while other powers preserved a high decoration for longer. But in the time decoration was showing its weak points, arsenals launched some incredible sailing masterpieces. The Swedish *Vasa* and the English *Sovereign of the Seas* are just two of the most known examples of warship decoration during the first half of the century.

The varied naval iconography shows that each vessel had a specific decoration made on purpose for her, which distinguished her from other vessels. Nevertheless, some elements were usually present in several ships from foreign navies. Indeed, ornaments and sculptures were arranged following a similar logic. For this reason, it is possible to highlight a scheme used on all ships throughout the century. Moreover, the artistic style and the iconographical themes used were sometimes common in the European naval powers. These universal features will remain almost the same throughout the century, creating a decorative effect that can be identified as typical of the 17th century.

General arrangement

Looking at naval iconography, it becomes clear that not all the sections of a ship were decorated in the same way, and with the same amount of sculptures and details. On the contrary, some areas were practically bare, while others contained the vast majority of the decorations. To understand this dissimilarity, it is helpful to ideally divide the ship into three areas: stern, bow, and sides. This partition was also commonly used in naval iconography in the "ship portraits", which were paintings in which a single ship was shown in three views, namely from the rear, one side and the front. By comparing these three sections, it is possible to observe a general scheme in the arrangement of the decorations used by European navies.

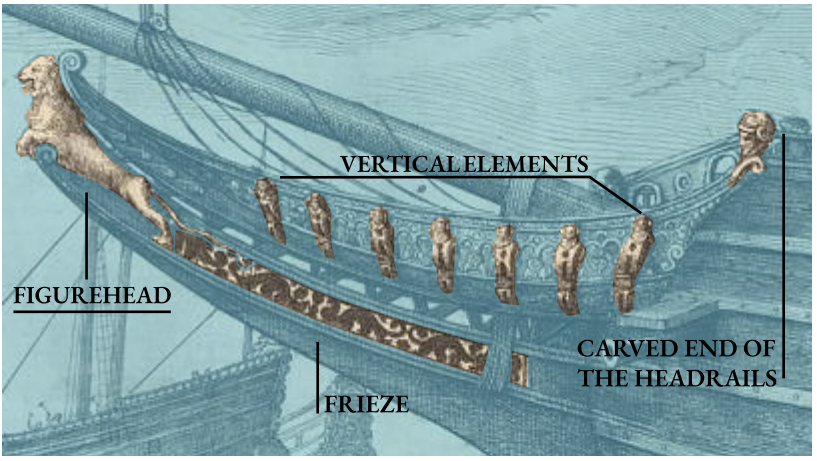
Stern – The rear part of ships was the most decorated and sumptuous area of every vessel. The flat high surfaces of the superstructure made the stern the perfect part to add sculptures and ornaments. It was the stage on which artists could display their skills by integrating complex groups of sculptures of considerable size. In the largest ships, the lowest part hosted a tier of gunports, often framed in richly ornate elements and below them, the rudder was often adorned with a vertical sculpture. In the central part, the stern hosted the galleries, which created by themselves dynamic, rhythmic effects of shadows and lights thanks to the projecting elements and dark openings of doors and windows. Their balustrades were enriched with numerous sculptures and they also offered ideal bases for human-size caryatids and telamons which supported the higher levels.



Etienne Compardel, *Konung Karl (1694)*, n.d., Marinmuseum, Karlskrona.

Jean Bérain, the Elder, *Design for the decoration of the stern of Le Foudroyant*, c.1693, Victoria and Albert Museum, London.

Detail of: Wenceslaus Hollar Bohemian, *Naues Mercatoriæ Hollandicæ per Indias Occidentales* (Dutch West Indiaman), 1647, The MET Museum, New York.



Willem van de Velde the Younger, *Portrait of the 'Britannia'*, 1684?, National Maritime Museum, Greenwich, London, Caird Collection.

Massive sculptures were placed at the sides of the stern, creating an artistic frame and connecting it with the sides. Above the galleries, there was a flat part called "tafferel" ("taffrail" in modern English).[94] The world derives from the Dutch term "taffereel", which means "picture" or "tableau", and that was used to describe the carved panel at the top of the transom. That was the main section of the stern, holding the central sculptures groups. The subjects of those sculptures, such as emblems or figurative representations, were usually linked with the name of the ships; for example, the English *Prince Royal* (1610) had the three ostrich feathers, heraldic badge of the Prince of Wales.

Bow – The fore part of a ship, and precisely the beakhead, was the second area where the decoration was concentrated. The main element in this section was the figurehead, the ever-present sculpture placed at the end of the eking pieces (the beams supporting the beakhead structure). It could be of a modest size or as large as an equestrian statue. The figurehead was surrounded by other smaller elements, which linked it to the hull. Generally, there were vertical human-shaped sculptures placed throughout the beakhead structure covering the head timbers. Below it, a frieze was almost always connecting the longitudinal beams of the beakhead. It could represent specific figures or just floral decoration. Another sizable element was placed in the connection between the beakhead and the hull, at the end of the headrails; it was a curved piece of wood often having with human or animal shapes. The front part of the bow superstructure was decorated as well. Fake pillars carved with human shapes often gave rhythm to the bulkhead, and between them several carved panels enriched the structure.

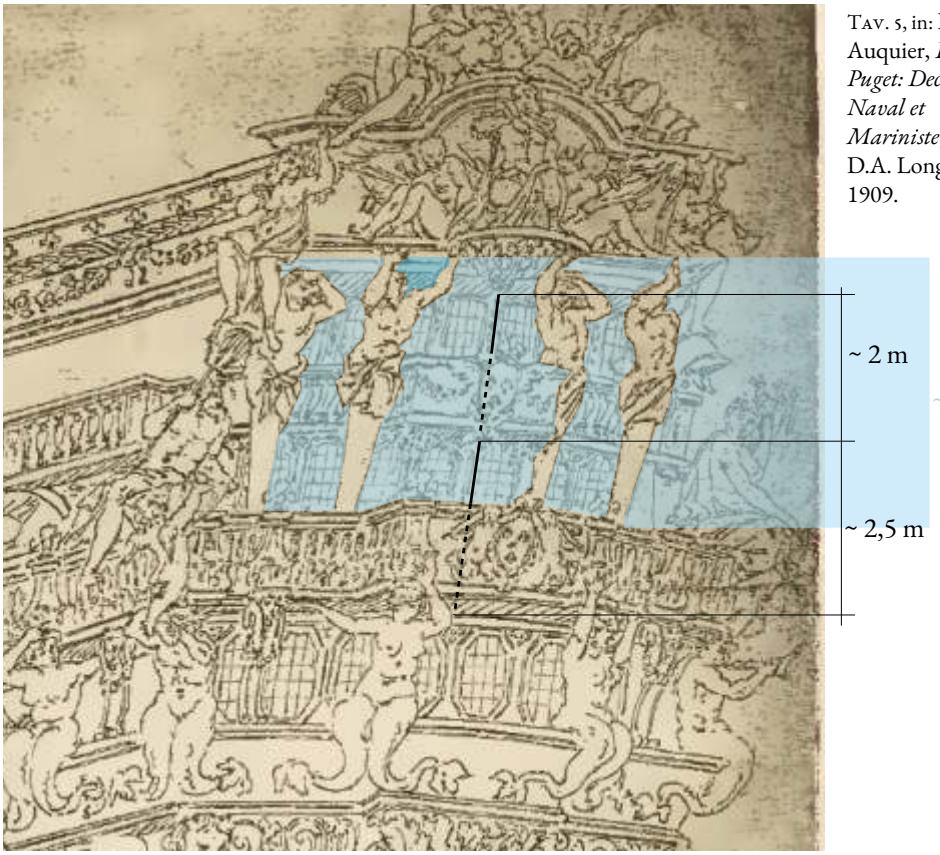
Detail of: Hendrick Cornelisz Vroom, *The arrival of Prince Frederok of Pfalz in Vliessingen in May 1613 on board the English warship Prince Royal*, 1623, Frans Hals Museum, Haarlem.

Sides – Few decorations were on the sides, making these the barest parts of a ship. Generally, the decoration was mainly in the upper area and precisely in the upper gun decks. Often, this section was painted, producing the effect of a coloured belt running throughout the whole length of the ship and so connecting decoration between the bow and stern. Gunports in the upper deck were sometimes rounded and generally had golden wreaths carved around them. Three-dimensional decoration could be either between gunports or directly attached to the inner side of gunports lids, although this solution was rarer. Nevertheless, in the lower tiers of gunports, it was more common to have only the inner part of the lids painted red.

Cornelis Verbeeck, *Men o' war outside the coast with a city and a fort beyond*, 1625-30, Private collection.

Common style and themes of decoration

Decorations included wooden statues and ranged from bas-reliefs and small details to human-sized, full-relief figures. For instance, the stern of the French warship *Monarque* (1668) is reported to have caryatids between galleries which were about twenty feet (6 m).[95] This dimension can be compared to the drawing of another French ship (probably the *Royal Louis*) of the same period, also made in the arsenal of Toulon and published as part of a catalogue by the curator of the Musée Des Beaux-Arts of Marseilles Philippe Auquier.[96] The drawing shows how these huge caryatids were made and how they filled the space between two galleries. Considering that the height of a gallery was about 2 and 2 and a half meters,[97] this kind of sculpture could reach considerable heights.



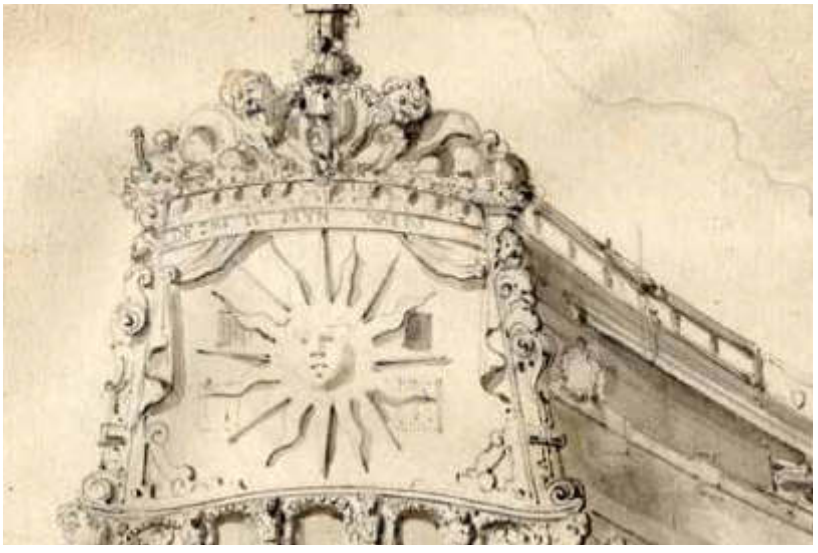
Tav. 5, in: P. Auquier, *Pierre Puget: Decorateur Naval et Mariniste*, Paris, D.A. Longuet, 1909.

Medium size and even much smaller elements of decoration, which were carved with accuracy, surrounded larger sculptures creating a dynamic and luxurious effect typical of Baroque art. According to this style, statues and ornaments were generally painted with bright colours, such as blue,

red, yellow, and gold, and they stood out against a dark background, which could include dark colours such as blue and green, or simply be the wooden brown of the hull underneath them. It was not uncommon to have a general style widespread in Europe. Indeed, artistic trends have always circulated cyclically throughout Europe, influencing aesthetic taste in many regions and a style could be used in different places at the same time, or present in chronological succession. By studying the style of decoration, it is possible to identify not only a style but also themes and subjects for the statues used in European fleets during the 17th century.

Name of ships – The name of a ship was usually represented in ornament in some way. References to the name could also be found all over the ship, and the central decoration in the stern generally referred to it. It could be a connection made by symbols or coats of arm, such as the ostrich feathers for the English *Prince Royal*, or a clear depiction of the subject name itself; for example, the Dutch *Zon* (1694) had a golden sun on her tafferel. The name could also be translated as a personification of an abstract

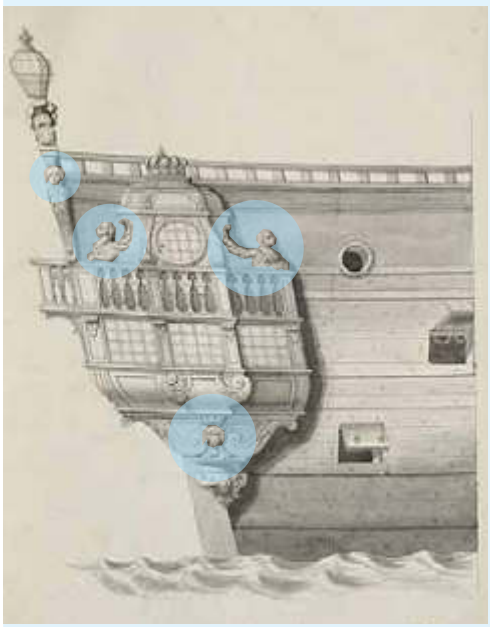
Detail of: Willem van de Velde II, *The Zon*, 1633-1707, The British Museum, London. Inscription: "DE SON IS MYN NAEM" (Sun is my name).

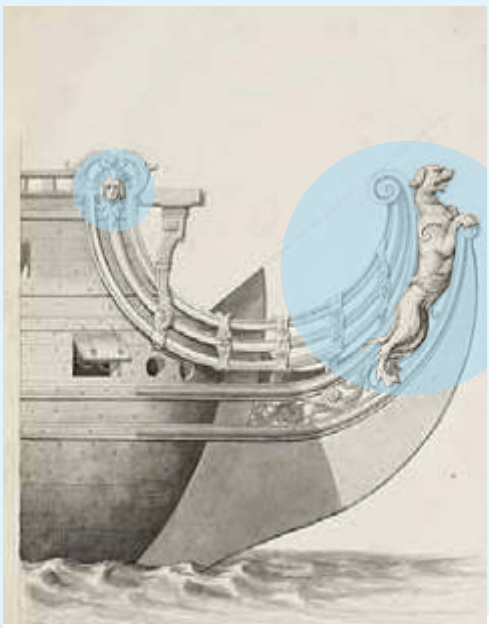


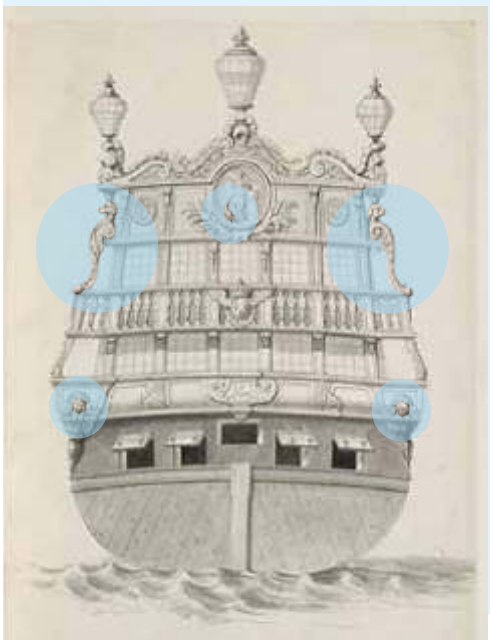
Detail of: Hugo Allard I (attributed to), after Willem van de Velde I, *Aemilia, het vlaggenschip van Tromp*, c. 1639, Rijksmuseum, Amsterdam.

concept; this solution was particularly used in the French navy, as names of second and third rates referred to ideal qualities of the monarchy. For instance, the third-rate *Fidèle* (1671) had dogs, symbols of loyalty ("fidèle" means "loyal") as the main subject. With time, the name started to be directly written down in words on the stern, usually inside a frame or a long ribbon.

Below and on the left: Jean Berain I, *Vaisseau: la Fidèle*, Musée du Louvre, Paris, Département des Arts graphiques.

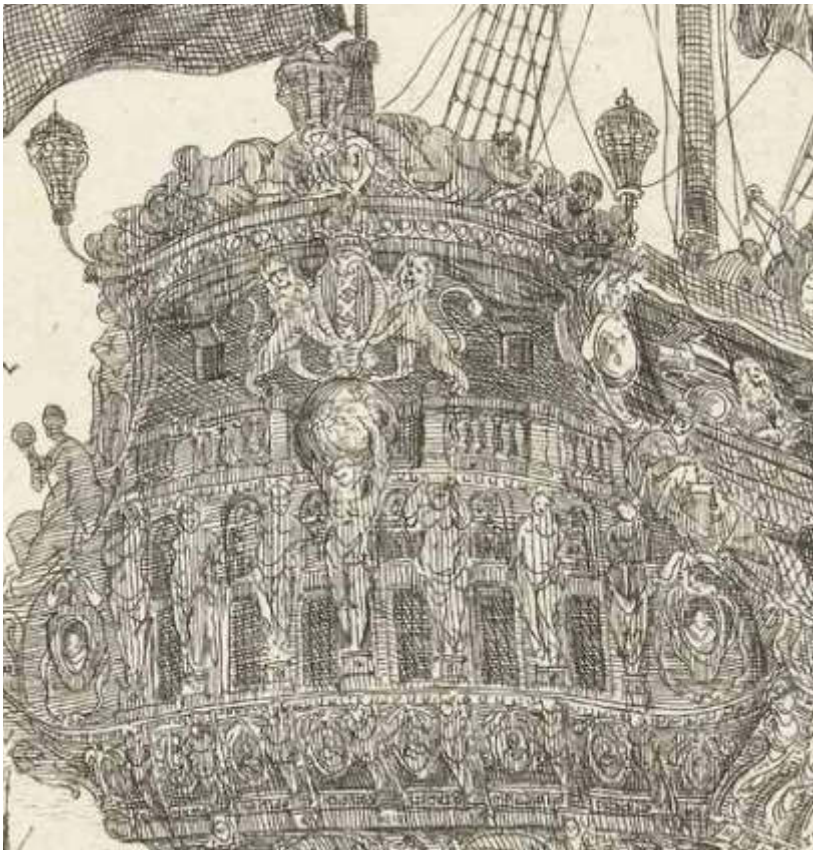






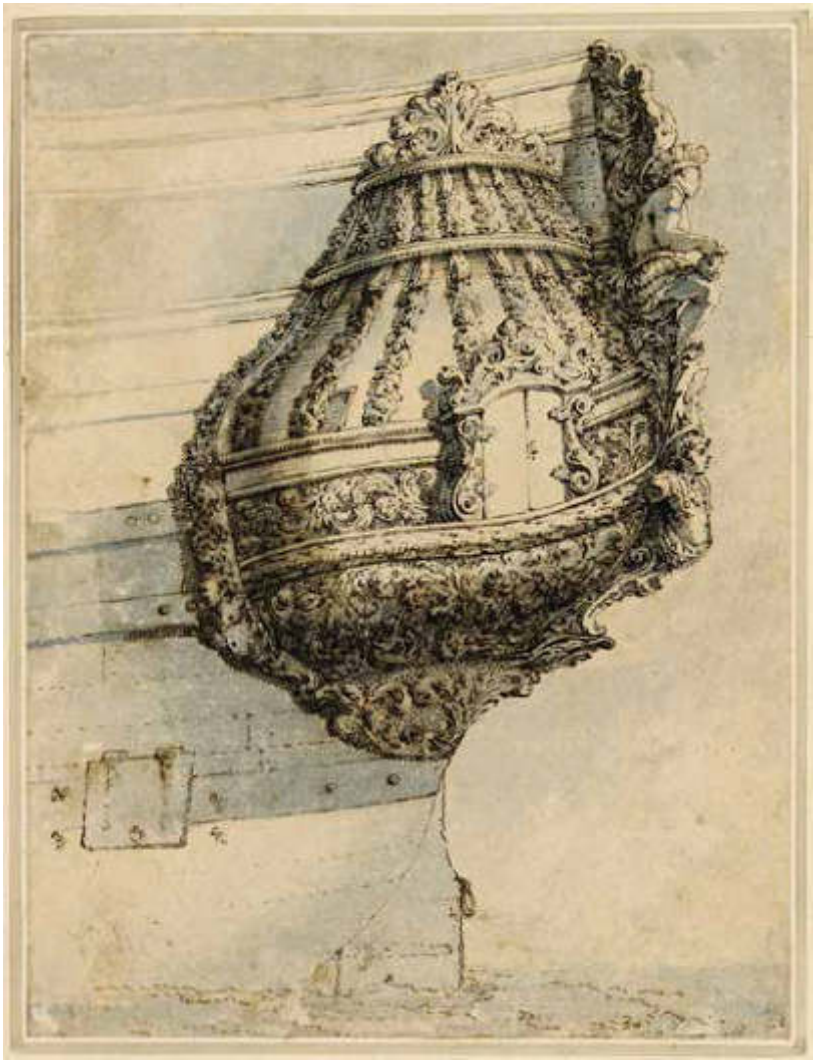
On the right: Anonymous, French, *La Fidelitè,* 17th century, The Met Museum, New York.
This is a French drawing depicting the allegory of the loyalty, similar to the central decoration of the French ship *Fidèle*.

Classical elements in Baroque style – As a consequence of the Italian Renaissance, during which Greek and Roman civilisations had been rediscovered, decoration made use of classical elements reinterpreting them in the Baroque style, which was full of details and preferred colour contrasts. Echoes of traditional mythology were present in the decoration of many ships. Gods and goddesses, heroes like Hercules, satyrs, and sea creatures such as sea horses, tritons and mermaids were commonly shown in the maritime iconography of the time. Cherubs, putti, and allegorical figures, such as winged Phemes and the allegory of the four continents, were broadly used, and vertical elements were frequently made in human shapes such as caryatids, telamons and herm pilasters. As well as the human figure, animal shapes were largely applied, in particular dolphins, eagles (especially linked to the Roman empire) and lions as symbol of power par excellence. Borderline figures between human and beast, grotesque mascarons were really common; they were often smaller sculptures than the other subjects but very numerous. Drapery was often used in the central part to create an elegant frame for the central group of sculptures, and natural elements like floral motifs and seashells were spread everywhere, filling and enriching empty spaces.



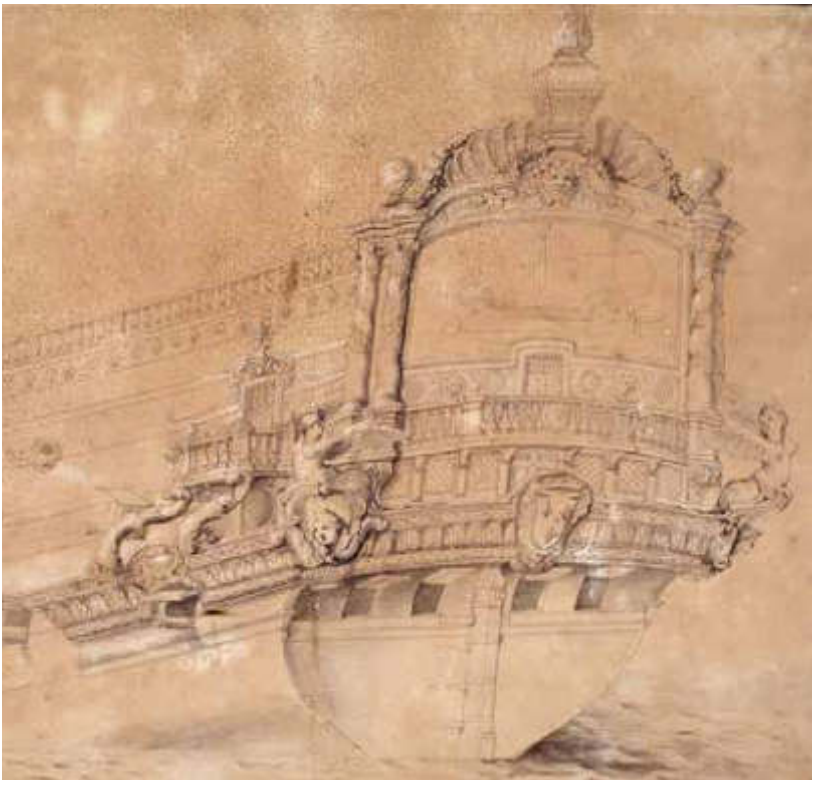
Detail of: Ludolf Bakhuysen, *IJ with ships, Seascapes* (series title), 1701, Rijksmuseum, Amsterdam. The print shows the huge sculptures in the stern. The main sculpture is in the centre and it looks like an Atlas.

Lieve Pietersz. Verschuier, *Arrival of Charles II, King of England, in Rotterdam, 24 May 1660*, c. 1660 - c. 1665, Rijksmuseum, Amsterdam.
It is possible to see the allegory of the four continents in the side.



Simon de Vlieger, *The Port-Quarter Gallery of a small Dutch ship*, early to mid 17th century, National Maritime Museum, Greenwich, London.

Willem van de Velde (II), *Transom of a Yacht with a Standing Putto and a Coat of Arms*, 1643 - 1707, Rijksmuseum, Amsterdam.



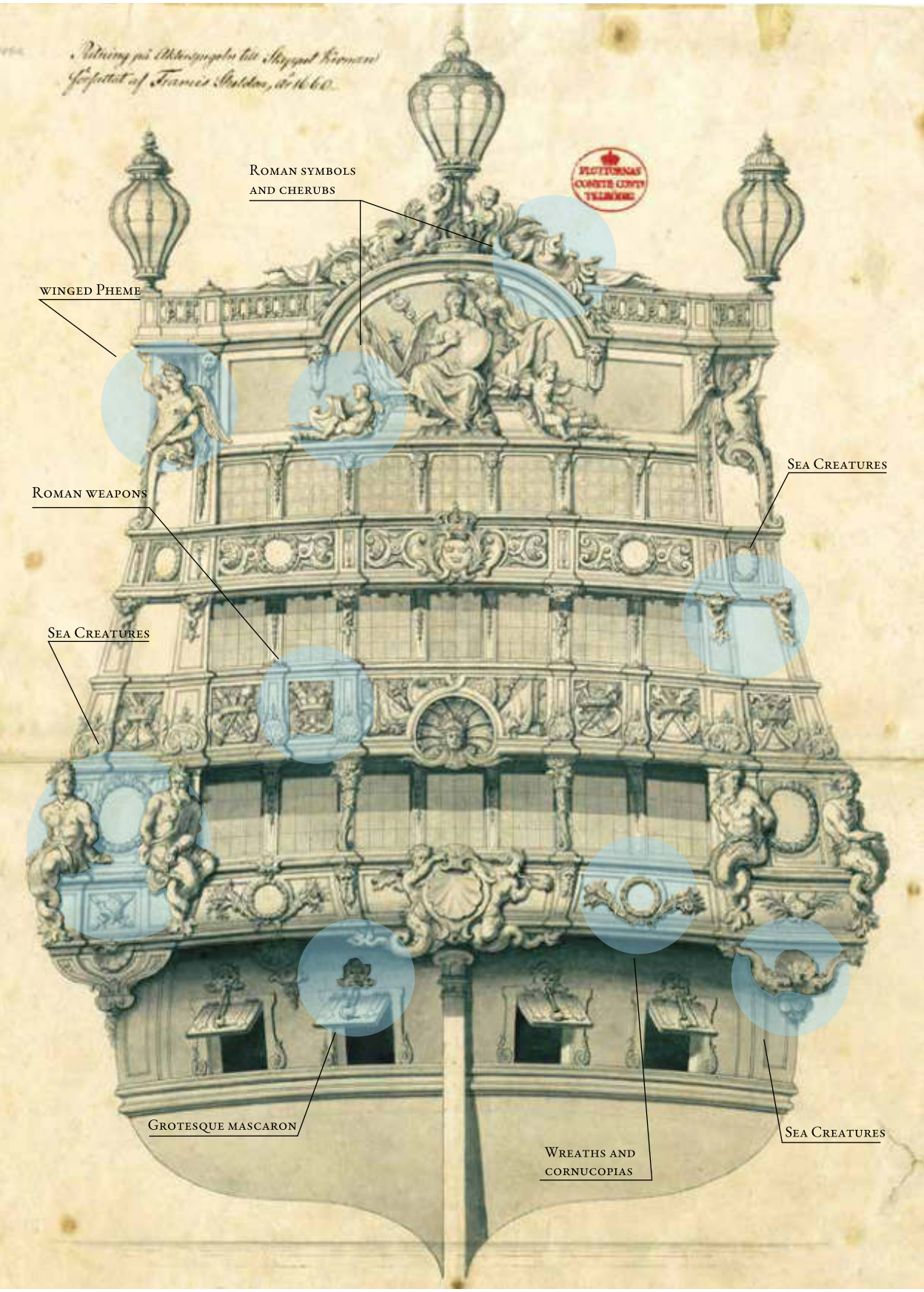
Pierre Puget, *Arrière du Paris*, c 1659, Musée des Beaux-Arts de Marseille.

Deatil of: Pierre Puget, Charles Le Brun, *Poupe de vaisseau royal le Royal Louis*, Ecole nationale superieure des beaux-art, Paris.

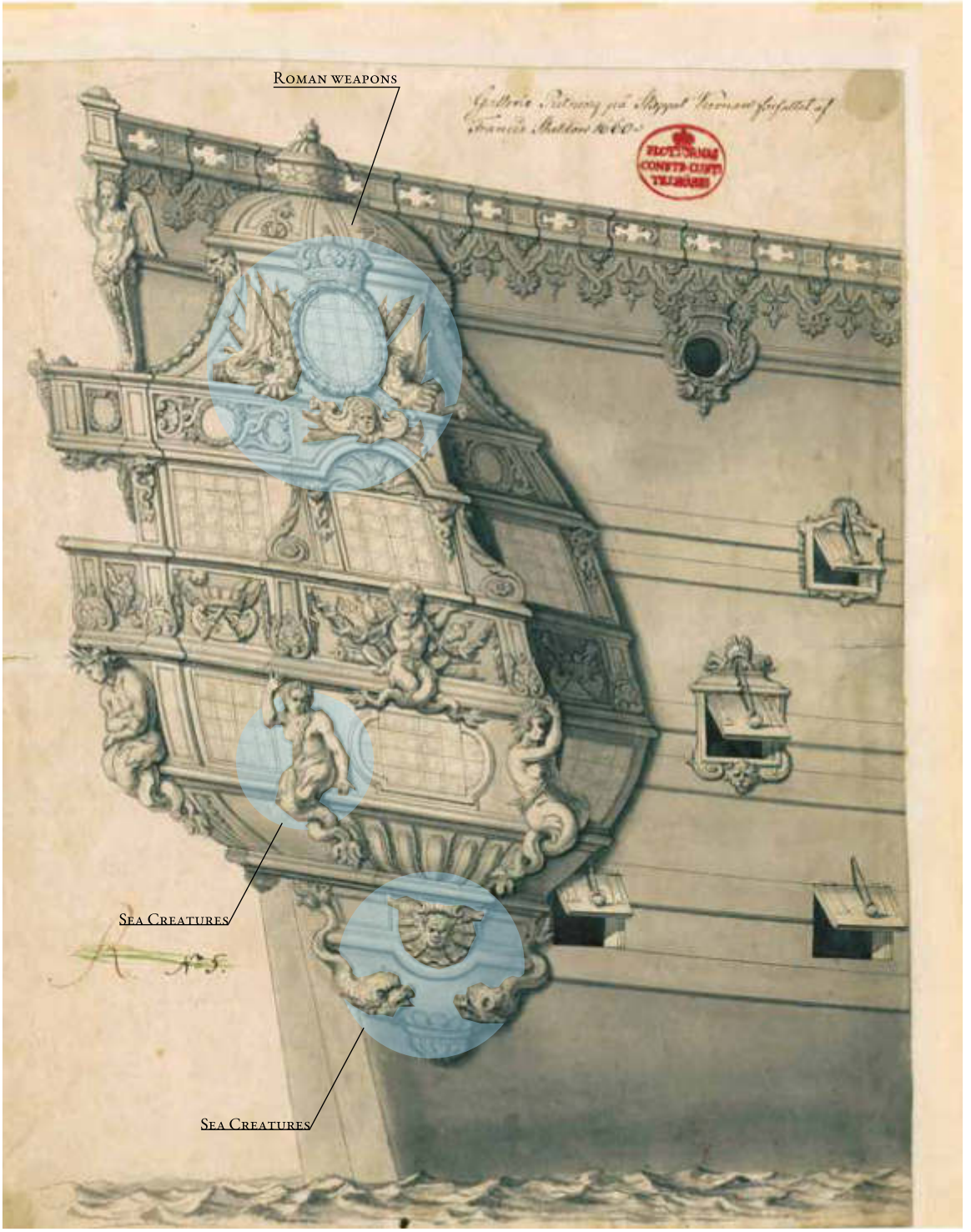
Roman Empire – Although part of the classical tradition, the Roman empire greatly influenced the decoration of ships during the 17th century and therefore can be considered a separate element with a marked iconographic identity. The emperor was the figure that modern monarchs wanted to be identified with and for this reason, Roman emperors were represented in decoration. Furthermore, it was common for 17th-century sovereigns to be depicted wearing Roman clothes, such as the statue of Louis XIV in the stern of the flagship *Royal Louis*. This tendency to depict important persons with classical clothing was highly used during the 15th century and was clearly still in use two centuries later in European monarchies. Indeed, not only the French king but also James Stuart had classical representations of himself, like the portrait made by the French-born painter Henri Gascars (1635 – 1701) in 1672, showing the English monarch in Roman costume. Not only Roman emperors and clothes but also symbols of the antique naval power were used in ship decoration. The galley was the element that par excellence represented the ancient naval power and her, or some of her components, such as the rudder, *cheniscus, rostrum* and *aplustre* were therefore commonly depicted. Roman weapons and objects such as helmets, shields, swords, battering rams, and also the "bundles of the lictors" were illustrated as well.

Parts of Roman galleys

Aplustre *Rudder* *Cheniscus* *Rostrum*


Roman symbols
and cherubs
winged Pheme
Roman weapons
Sea Creatures
Sea Creatures
Grotesque mascaron
Wreaths and
cornucopias
Sea Creatures

The same elements can be seen in the Swedish warship *Kronan* (1660) with a predominance of symbols of the Roman empire as well as sea creatures.



Francis Sheldon, *Kronan, galleriritning*, 1660, National Archives of Sweden, Stockholm.

Distinctiveness in decoration

Despite a common style and themes, the decoration of European naval powers was slightly distinctive. Certainly, the aesthetic taste is intrinsically influenced by the context, and this can explain differences depending on the geographical area. Nevertheless, this consideration is not enough to understand the meaning of these differences, since, as previously discussed, artistic styles had no geographical barriers. Navies had become state-owned tools and thus the European political situation has to be taken into account. The consolidation of states' power and the creation of state navies led to conflicts that were increasingly linked with a growing citizens' sensibility of identity. In this sense, the desire for supremacy was no longer just meant as a territorial conquest but also as an ideological phenomenon. Sovereign's power, and thus metonymically that States, was becoming more and more symbolic; at the same time it was also a significant aspect that had to be transmitted to the rest of the world in every possible way. States were the clients commissioning the warships and their decoration, which were a means of propaganda on the sea. In this sense, warships were, a manifesto of the state, through which the personality and identity of the kingdom were projected outside the territorial boundaries. Therefore, if artists were entrusted with the task of realizing the decorations in practice, the choice of subjects for their sculptures generally depended on monarchs' choices. For this reason, the study of symbols and decoration reveals both coherence with the context of artistic production and the personal identity of political powers. Therefore, it is clear why ships of the catholic monarchy of Philip II of Spain had images of saints and other religious subjects, or that in the fleet of the egocentric Sun King there were symbols like the sun, the fleur-de-lis of the Bourbon family and the letter "L", initial of the name of the sovereign. In order to show what could be the differences, two states had been selected as examples and those are England and the Dutch Republic. French style will be analysed separately pursuant to its particular condition.

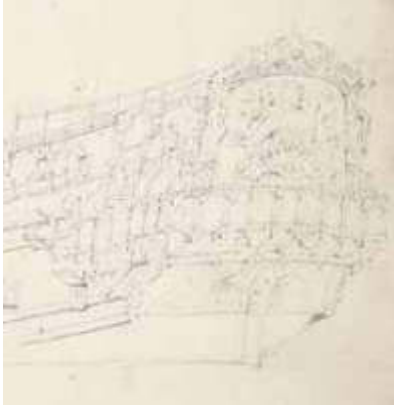
English decoration – At the National Maritime Museum, Greenwich, London, a 19th-century detailed model of the flagship *Sovereign of the Seas* (1637) shows the decorations that adorned English warships in the 17th century. The 1:48 scale model was commissioned in 1827 by naval architect Sir Robert Seppings (1767 – 1840), Surveyor of the Navy, to be in his ship model gallery at Somerset House. In accordance with the model, naval iconography shows that, despite having curved lines, the Anglo-Saxon style was characterized by a rigorous and particularly pronounced geometry. The layout of the decoration, boxed in square spaces, refer to the Jacobian style of English architecture, of which Hatfield House (1611) is a famous example.

Great Hall of Hatfiled House, Hatfield, England, United Kingdom, picture by Matt Brown, taken the 5 July 2015.

Details of: Jeronymus van Diest II, *Royal Charles off Hellevoetsluis, captured by the Dutch after the Raid on the Medway,* 1667, Rijksmuseum, Amsterdam.

The following series of drawings are all by the Van de Veldes and are ordered following the chronology of the ships, although not all of them have been identified or the attribution is not certain. In particular, the first drawing should depict the *Yarmouth* (1653), the second is certainly the *Plymouth* (1653), the third drawing depicts the *Princess* (1660), the fourth is a portrait of the *Resolution* (1667), the fifth should represent the *Woolwich* (1675), and the last one could be one of the ships built between 1690 and 1695, even if some of the features suggest her to be a rebuilt much older ship.[98] Comparing the stern decoration of these ships, it can be observed that the general arrangement remained the same throughout the century. The stern looked like a quite flat area enlivened by the galleries and their balustrades, which surrounded the rear parts of the sides. The tafferel was a large rectangular area that occupied about half of the stern and the central group of sculptures was generally depicting the coat of arms of the United Kingdom with a lion and a unicorn as supporters.

Two-deckers built in 1650s and 1660s



Detail on the left: Willem van de Velde (I), *English two-decker, possibly the 'Yarmouth', built in 1653.* 1675?, NMM, Greenwich, London.

Detail on the right: Willem van de Velde (I), *Portrait of the 'Plymouth'*, c. 1675, NMM, Greenwich, London.

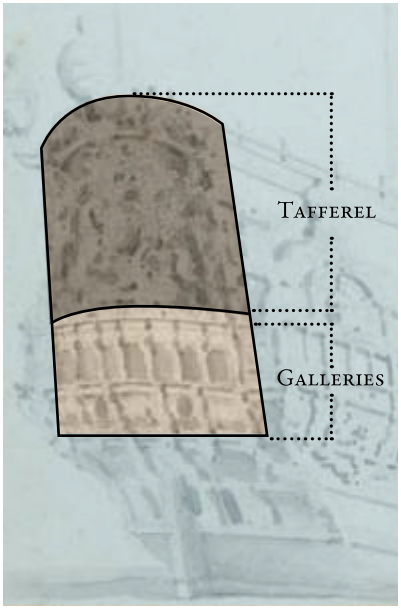
Detail on the left: Willem van de Velde (II), *Portrait of the English Ship 'Princess'*, c. 1673, Lowell Libson & Jonny Yarker Ltd, London, collection Curtis O. Baer.

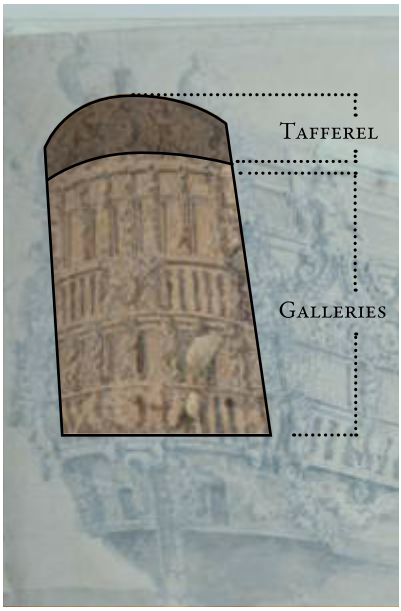
Detail on the right: Willem van de Velde (II), *Portrait of the 'Resolution', built in 1667*, 1676, NMM, Greenwich, London.

[98] These attributions are in accordance with the National Maritime Museum, Greenwich, London.

Some changes occurred in the last decades of the century. Indeed, the tafferel and thus the space dedicated to the main group of sculptures was reduced.

Comparison between two-deckers

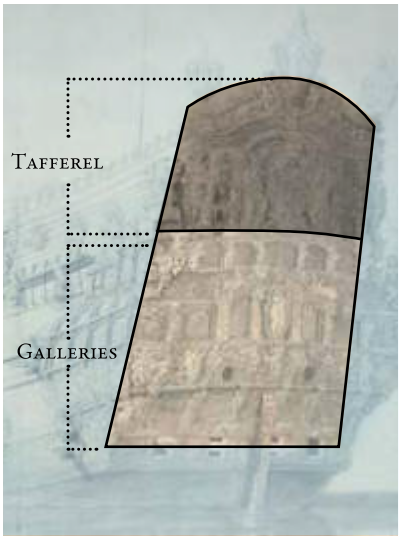


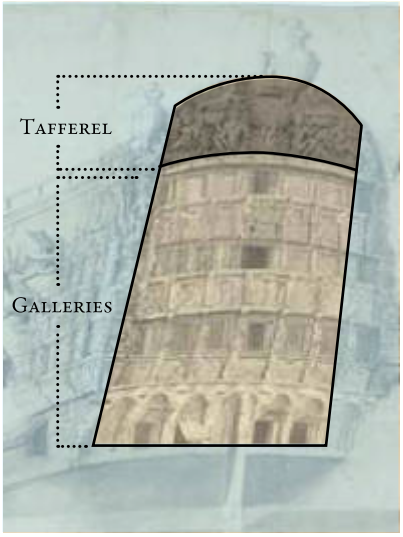


Detail on the left: Willem van de Velde (I), *Portrait of an English two-decker*,1676?, NMM, Greenwich, London.

Detail on the right: Willem van de Velde (II)?, *Portrait of an English Fourth-rate about 54-guns,* 1690?, NMM, Greenwich, London.

Comparison between three-deckers





Detail on the left: Willem van de Velde (I), *Drawing; offset (?),* c. 1670, © The Trustees of the British Museum. Description: English three-decker.

Detail on the right: Willem van de Velde (I) or (II), *Richly decorated English (?) frigate (right side)*, n.d., Rijksmuseum, Amsterdam.

Since the beginning of the construction of these highly decorated ships of the line, the English used gold to a great extent, especially in the stern of their vessels. For example, the *Sovereign of the Seas* was also known as the "Golden Devil"[99] for the rich golden decorations on a black background, particularly striking in the stern area. The square geometry combined with gold created a visual golden frame, and the extension on the sides, created the effect of a golden structure mounted on the stern, which characterized English ships.

Detail on the left: Peter Lely, *Peter Pett and the Sovereign of the Seas*. c. 1645-50, National Maritime Museum, Greenwich, London.

Detail on the right: Jan Karel Donatus van Beeq, *Shipping in an Estuary*, c. 1701, National Maritime Museum, Greenwich, London.

Detail below: Peter Van de Velde, *The Dutch burn down the English fleet before Chatham, June 20 1667,* c. 1670, Rijksmuseum Amsterdam.

[99] E. FRASER, *Famous Fighters of the Fleet. Glimpses Through the Cannon Smoke in the Days of the Old Navy*, London, Macmillan and Company, 1907.

Jan Karel Donatus van Beecq, *The HMS Prince Before the Wind*, 1679, National Maritime Museum, Greenwich, London, Caird Collection.

Jan Abrahamsz. Beerstraten, *The Battle of Terheide, 10 August 1653,* 1653 - 1666, Rijksmuseum, Amsterdam.

The Dutch approach – The pragmatic mind of the Dutch gave little space to the aesthetic quirk, especially if this meant a negative implication both from the point of view of costs and nautical qualities. Nevertheless, this did not mean that Dutch ships were without any type of decoration, but rather that ornaments were made in such a way as to impact seaworthiness and costs as little as possible while maintaining a specified weight and volume, not to be exceeded with projecting elements. Being a Republic, there was no sovereigns, no crowns, and no royal symbols to display; the lion, a symbol of power, was the most used subject in their sculptures, especially in the figurehead. The Dutch fleet was also characterized by the use of bright colours, especially red, blue and gold.

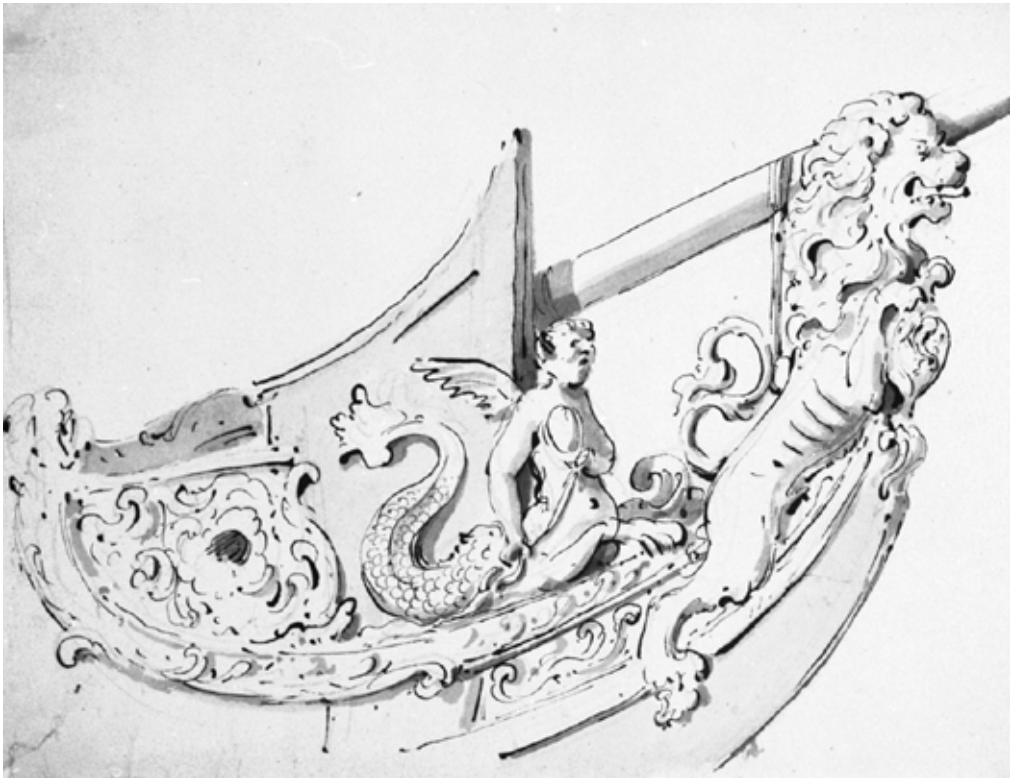
Detail on the left: Jan Abrahamsz Beerstraten, *Dutch ships in a foreign port*, 1658, Rijksmuseum, Amsterdam.

Detail on the right: Abraham Storck, *Harbour Scene with Medieval Building*, 1674, Nivaagaard Museum, Nivå, Denmark.

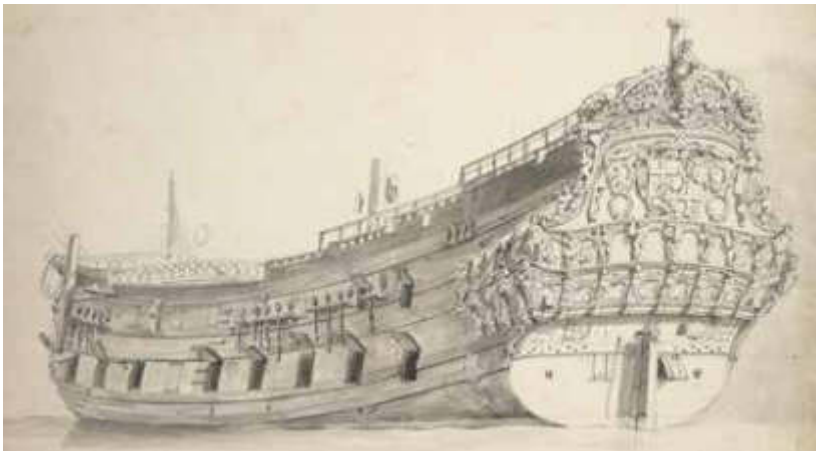
Detail on the left: Reinier Nooms, *Battle of Livorno*, 1653 - 1664, Rijksmuseum, Amsterdam.

Detail on the right: Willem van de Velde (II), *Dutch Ships in a Calm Sea*, c. 1665, Rijksmuseum, Amsterdam.

Below: Willem van de Velde, *The head of a Dutch yacht*, c. 1686, National Maritime Museum, Greenwich, London.



Furthermore, decoration, which was generally concentrated on the stern, also assumed a practical value. Indeed, it had a close connection with the name given to ships, helping with the recognition of the different vessels. For instance, the warship *Gouden Leeuw* (1666), which was the flagship of Cornelis Maartenszoon Tromp (1629 – 1691) during the Battle of Texel (1673), had represented a golden lion, "gouden leeuw" in Dutch. Furthermore, ships were often named after Dutch cities or provinces and in that case, decoration could represent the coat of arms of the place from which they had taken their name. This is the reason why several ships were called "Wapen van ..." (coat of arms of ...) such as the *Wapen van Utrecht* (1621), one of the large ships built in the first half of the 17th century, which had depicted the coat of arms of Utrecht. It sometimes happened that a predominant element of the coat of arms could in turn affect the name of ships; this is the case of *Wapen van Holland* (1653), whose coat of arms depicted a red lion, and which for this reason was also called *Roode Leeuw* (red lion).[100]

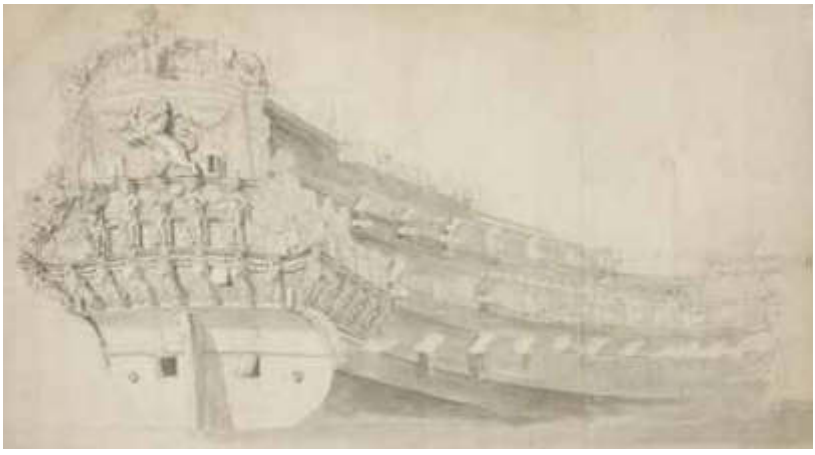


Willem van de Velde the Elder, *The 'Provincie van Utrecht',* 1665 (?), Caird Collection, National Maritime Museum, Greenwich, London.

Detail of: Lieve Pietersz, Verschuier, *Het kielhalen van de scheepschirurgijn van admiraal Jan van Nes,* 1660 - 1686, Rijksmuseum, Amsterdam.

[100] J. BENDER, *Op. cit*.

Detail of: Anonymous, *The 'Eendracht' in battle with two Swedish warships during the Battle of the Sont*, c. 1670, Rijksmuseum, Amsterdam.



Willem Van de Velde (I), *Hull of the Dutch ship Gouden Leeuw*, c.1666-86, Victoria and Albert Museum, London.

Detail of: Ludolf Bakhuysen, *Rough sea with ships*, 1697, Rijksmuseum, Amsterdam.

3. Louis XIV and the French navy[101]

From a constructive art to an artistic construction

Among the European States, France was the one in which the artistic character became the strongest, and played a central role in shipbuilding. Indeed, French decoration was more accomplished and excessive than that of others navies with ornaments, wooden statues and gold, as never seen before. Since vessels were also used by monarchs as propaganda tools, the main thrust to use ornaments in abundance was bound to come from them. For this reason, to understand the nature and the peculiarity of French ships' decoration, it is necessary to take into consideration the French monarch of that time. During the 17th century, France was governed by a particular and unique king: Louis XIV. After he ascended to the throne in 1643, he strove to concentrate power in his own hands strengthening his political identity through a programme that is best exemplified by his well-known motto «l'État, c'est Moi» ("I am the State"). The implications of this concept were not marginal. Indeed, that meant that France was no longer only a territory to be governed but an extension of the sovereign and the king did not have to act on behalf of the state because he *was* the state. Through this ideological overlap of state and king, every display of France's power was directly a glorification of the king. Similarly, promoting the monarch's magnificence and wealth meant glorifying the state.

France had experienced an important development of the navy, which became relevant also for the French king. All European states started to use vessels as ambassadors of kings at sea and in France, they were strongly influenced by the ideological approach of Louis XIV. An example of this influence can be observed in the names of ships. Until the early years of the 17th century, ships were usually named after saints; the ships *Saint Michel* (1621), *Saint Jean* (1621), *Saint François* (1625), *Saint Charles* (1628), *Saint Thomas d'Aquin* (1642), and *Saint Jacques de Dunkerque* (1643) are all good examples of this trend. Nevertheless, during the Sun king's reign, this tradition changed and almost all vessels' names were chosen with great attention in order to express royal identity. The subject of names depended on the vessels' class; the flagships, which were leading the fleets, were named after the King himself, who led the state. *Soleil Royal* was the flagship in the Western fleet and *Royal Louis* was the flagship in the Eastern fleet. Further down in the pecking order, there were the First Rate

[101] A shorter version of this paragraph had been published in: C. TACCHELLA, "The Royal Louis (1668), a sailing masterpiece", in *International Journal Maritime Engineering, Vol. 163, Part A3, Jul-Sep 2021, A-175-A-184*

vessels; their names had to refer to royal symbols such as *Dauphin Royal*, *Monarque*, *Couronne* (1669), *Sceptre* (1671) and *Lys* (1691). The vessels which were classified as "Premier Rang Ordinaire" (boarding about 80 guns) and Second Rate (60-70 guns) generally had names symbolizing the Crown's virtues, such as *Superbe* (1690), *Glorieux* (1678), *Magnifique* (1685) and *Invincible* (1690).[102] Knowing the great importance given to names, one can easily understand why the external design and decoration could not be overlooked. A powerful fleet was not enough, since the king's warships had to be recognizable for their beauty and so shipwrights' task was not only to build efficient vessels but also to make sure they looked astonishing. Thus, they had to be more adorned than any other foreign ship. Therefore, the European trend to decorate warships combined with the strong personality of the Louis XIV style followed the tendency to embellish every detail and generate an overabundance of ornaments. From the second half of the 17th century, French ships were large and heavy sailing vessels made of sturdy oak[103] characterized by an abundance of decoration to show the grandeur of *Le Roi Soleil* to the world.

An early debate: la Reine *(1647) and Pierre Puget*

Although the decoration of French ships had its climax during the reign of Louis XIV, aesthetics had already its importance in ship design well before Colbert embarked on his quest to reorganize and improve the Navy French. Similar to what happened in the rest of Europe, when a permanent state navy had not been created yet, shipbuilding worked mainly for wealthy merchants and captains. They were the owners of vessels which, if needed, were rented by the States. Even if not to the same extent as the royal warships, ornaments were used on private ships and showed off the owner's wealth. In this context, a ship became the centre of heated debate over her decoration. That was the second rate, the "vaisseau amiral" *Reine*. She was built at the arsenal of Toulon, from 1645 to 1647, for the Grand Admiral Jean Armand de Maillé, Duke of Fronsac, Marquis of Brézé (1619 – 1646). The ship was called after the queen regent Anna of Austria, who had just become *Grand Maitrise de la Navigation* (1646). The sculptor Nicolas Levray (Unk – 1678) was working at the Toulon's arsenal since 1639,[104] and at that time, was making the decoration for the ships *Brèzè* and *Saint-Philippe*. Nevertheless, Brézé decided to assign the commission for the decoration of the ship to another artist. At the time the young artist Pierre Puget (1623 – 1694) was in Marseilles and used to make drawings in which he designed ideal decorations for warships. Probably some naval officers talked about him to the count of Brézé, who called the artist at Toulon to design the whole decoration of the *Reine*.

He asked Puget to design the most sumptuous ship he could imagine.[105] Puget sent the Queen Mother a pen-on-parchment drawing of the vessel, approximately twelve feet in length. The ship was depicted in navigation from three points of view. Near them sailed several galleys, boats and two other vessels, one of which had a richly carved stern. The drawing appears in the inventory drawn up after the artist's death and then turns out to be the property of a certain Mr Malcor in the 1860s and was also present at the Marseilles exhibition of 1861.[106] The stern was the most decorated part. Here, Puget designed a double gallery decorated with bas-reliefs and figures in the round. The gallery was surmounted by a large medallion in the centre. The medallion had inside a representation of Anne of Austria seen in profile in the middle of fleur-de-lis[107] and was held by two caryatids.[108]

When the *Reine* was launched, opinions regarding her decoration were divided. Someone praised Puget for having improved the decoration of French ships, and someone else complained of the excessive opulence of the carving, at the expense of seaworthiness. Nevertheless, from the records, it seems that her decoration was not particularly excessive if compared to the style of that time, and it certainly was not on the level of the great magnificence of ornaments that the French shipbuilding achieved over a period of twenty years. Puget appears to have moderated and diminished rather than increased the decoration. Indeed, his job was to distribute the ornaments in a frame that had been given to him.[109] Moreover, most of the sculptures had been made by the sculptor Levray according to Puget's drawings.[110] It was therefore probably the general harmony and the artistic taste that amazed the audience, generating adverse reactions between admiration and blame. Nevertheless, the criticism surrounding the *Reine* shows that in France there was an early debate about the excessive use of decoration in warships. On the one hand, ornaments were appreciated for increasing the beauty of vessels but on the other hand, the reduction of seaworthiness could not be overlooked. Brézé died the year before the launch, and the ship participated in the first action in 1650 as the flagship of the Chevalier Jean-Paul de Saumeur (1598 – 1667). The task was to escort smaller warships transporting munitions. The

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[105] G. PLANCHE, *Portraits d'artistes: peintres et sculpteurs*, Vol. 2, Paris, Michel Lévy frères, 1853, pp. 280-281.

[106] L. LAGRANGE, *Pierre Puget: peintre, sculpteur, architecte, décorateur de vaisseaux*, Paris, Librairie Académique, 1868, p. 17.

[107] *Ibidem*.

[108] V.F. BRUN, *Notice sur la sculpture navale, et chronologie des maîtres sculpteurs et peintres du port de Toulon*, Toulon, D'E. Aurel, 1861, pp. 13-15.

[109] *Ibidem*, p. 14.

[110] SOCIÉTÉ DE L'HISTOIRE DE L'ART FRANÇAIS, *Revue de l'art français ancien et moderne,* Paris, Jean SchemitJean Schemit, 1894, p. 283.

convoy left from Provence and while they were sailing, they encountered five Spanish warships between Cap Corsica and the isle of Capraja five Spanish warships. Saumeur engaged the Spaniard fleet, and during the combat, the *Reine*, armed with 52 cannons and carrying 600 crewmen, received more than 150 bullets but sent about 1200 bullets to the enemies

Above: Pierre Puget, T*rois vaisseaux avec les marques de leur dignité*, c. 1654, Musée du Louvre, Paris.

On the left, detail of: Adam Willaerts, *Vaisseau appareillant*, 1637-8, Musée d'art moderne André-Malraux (MuMa), Le Havre.

winning the four-hours combat.[111] For the next twenty years, increasingly large ships were built and on them, artists had the opportunity to display their abilities. In the late 1660s, the concern for aesthetics achieved the highest level and that led to the launch of ships in perfect Versailles style.

Versailles on board

Nowadays, Louis XIV is remembered for the aesthetic pomp of his reign, exalted and exasperated by the decorative abundance present in every element and detail. Indeed, Louis XIV created his own style, later called "style Louis XIV", designing a common visual aesthetic spread throughout his realm. From the fashion of the rich gold-covered clothes and laces worn at court to the elaborate hairstyles worn by ladies and gentlemen, the Louis-XIV style is certainly recognisable and unforgettable. Louis XIV's propagandistic action was extended to all fields and this was also expressed in style. Fashion, hairstyle, furniture, and architecture were all influenced by this approach. For this reason, the aesthetic concern that was present in the other European navies appeared in France with an extraordinary impact on shipbuilding and naval design. This is evident from the words of the superintendent of the Toulon arsenal d'Infreville, who in a letter to Colbert, dated 24 July 1668, speaking of the three vessels under construction, the *Royal Louis*, the *Dauphin Royal* and the *Monarque*, took care to ensure that

> «Cela pourra contenter S.M., n'ayant point de plus beaux vaisseaux à la mer que ces trois.»[112]

«It will satisfy His Majesty, having no finer vessels at sea than these three.»

The navy had to become a tool for showing off the glory of the Sun King, affirming the French grandeur through an abundance of decoration and formal beauty. The inner decoration and furniture of state palaces such as Versailles and the Fontainebleau Castle can be compared with the decoration of any ship from Louis XIV's fleet, and the striking similarities in colours, ornaments, and style are clearly shown. Using an anachronistic term, it could be said that Louis XIV was one of the first to create a "corporate identity" for his own company, which, of course, was the French state.

Elements widespread in Europe at that time, such as floral motifs, cornucopias, grotesque mascaron allegories, and references to Classical

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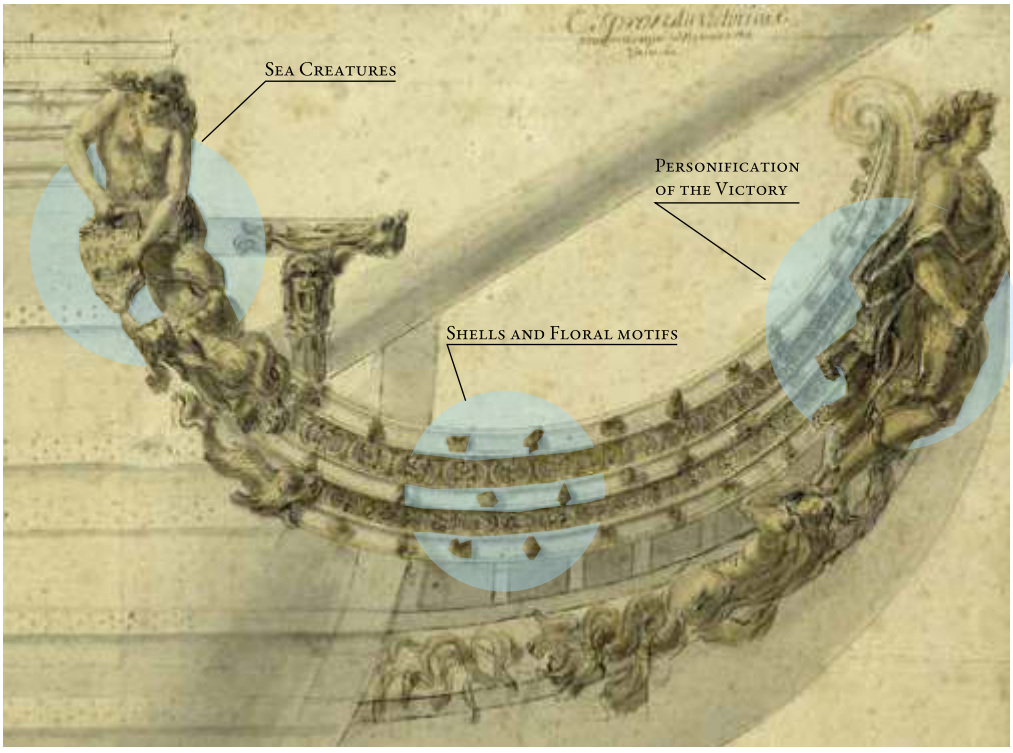
[111] L. GUÉRIN, *Les marins illustres de la France*, Paris, Morizot Libraire-Éditeur, 1861, p.246.

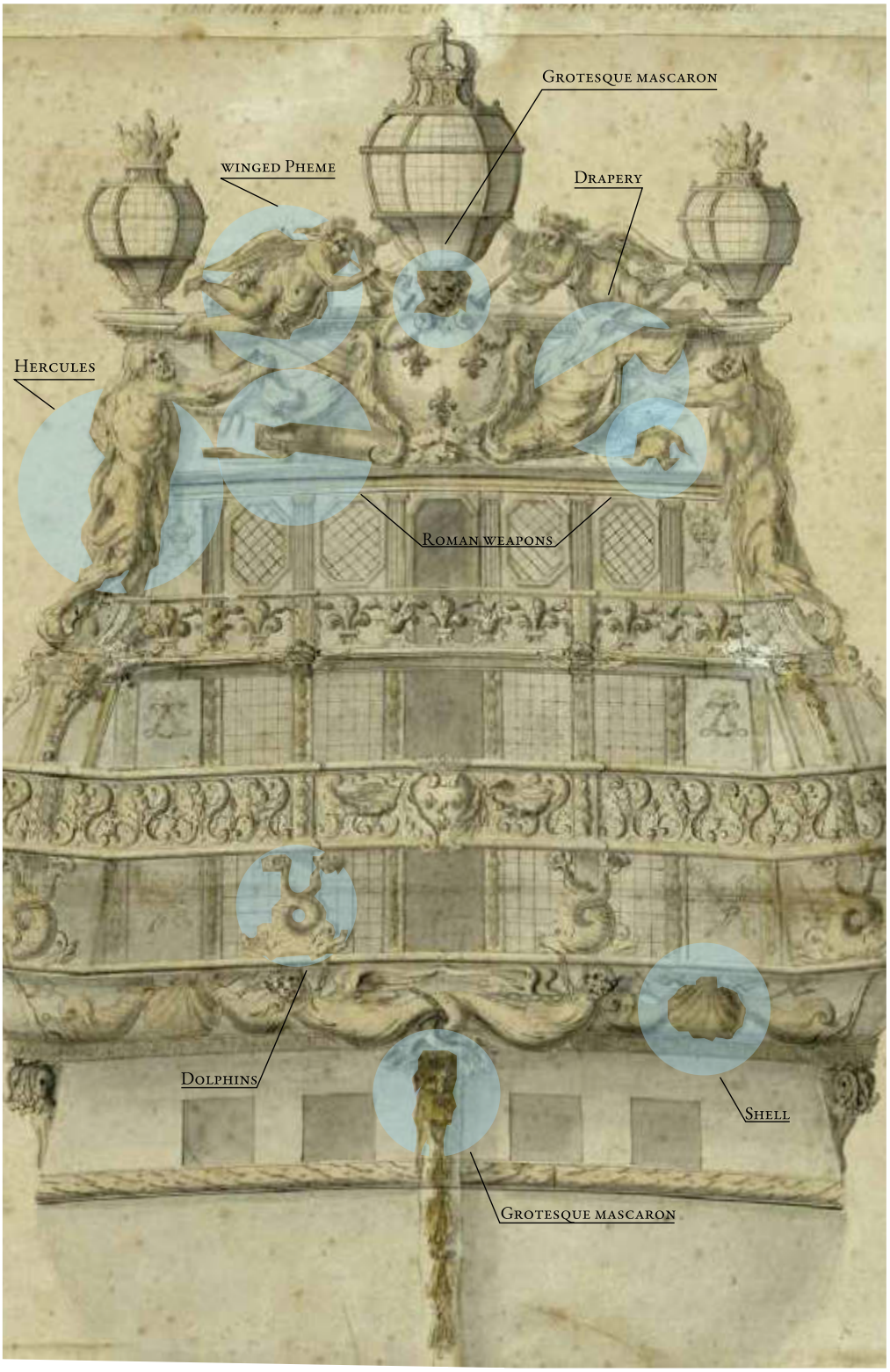
[112] M.A. DE MONTAIGLON, *Archives de l'art français. Recueil de documents inédits relatifs à l'histoire des arts en France*, Paris, J.-B. Dumoulin, 1856, pp. 246-247.

mythology and the Roman empire, were used in art, fashion, architecture, ornate furniture and naval decoration. Moreover, they were blended with subjects that expressed the personal identity of the monarchy. Among them, there was the royal monogram of Louis XIV*, that was made by the king's initials, the fleur-de-lis symbol of the House of Bourbon's coat of arms, the sun (Louis XIV was the Sun king), the crown, and the head of an infant (the young king). The abundance of ornaments was present in both high-rate and lower-rate vessels, even if lower-rates had smaller sculptures. This can be seen comparing the drawing of decoration of first-rates, such as the *Victorious* (1678) and *Dauphin Royal*, and third-rates, like the *Agreable* (1671). All French ships launched during the reign of Louis XIV were truly sailing masterpieces, in which every element was richly decorated to generate an effect of magnificence, perfectly in line with the splendour of Versailles. Golden fleurs-de-lis were spread everywhere creating a particular pattern used to fill empty spaces. The colours used were bright warm and elegant, such as white, pink, blue and gold. One of the most common combinations of colours used on warships was linked with the royal colours and that was to have golden details on a blue background.

** Monogram of Louis XIV*

Pictures below and in the next two pages: Claude Buirette, *Beakhead and Stern decoration of the Victorious,* 1691 Musée National de la Marine, Rochefort.




GROTESQUE MASCARON
WINGED PHEME
DRAPERY
HERCULES
ROMAN WEAPONS
DOLPHINS
SHELL
GROTESQUE MASCARON


Roman empire symbols
Grotesque mascaron

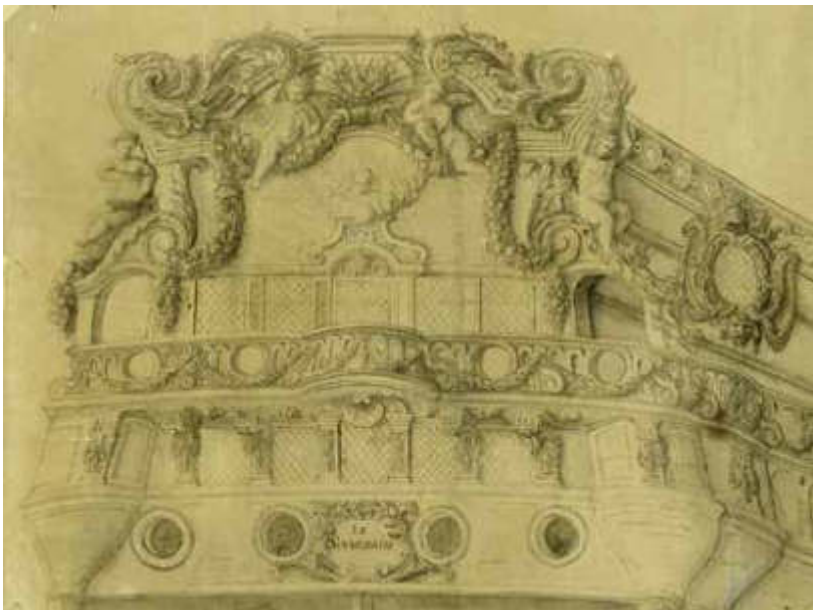
Detail of the previous picture: Claude Buirette, *Stern decoration of the Victorious,* 1691 Musee National de la Marine, Rochefort.

Charles Le Brun, *Renommée*, c. 1682-84, Louvre museum, Paris.

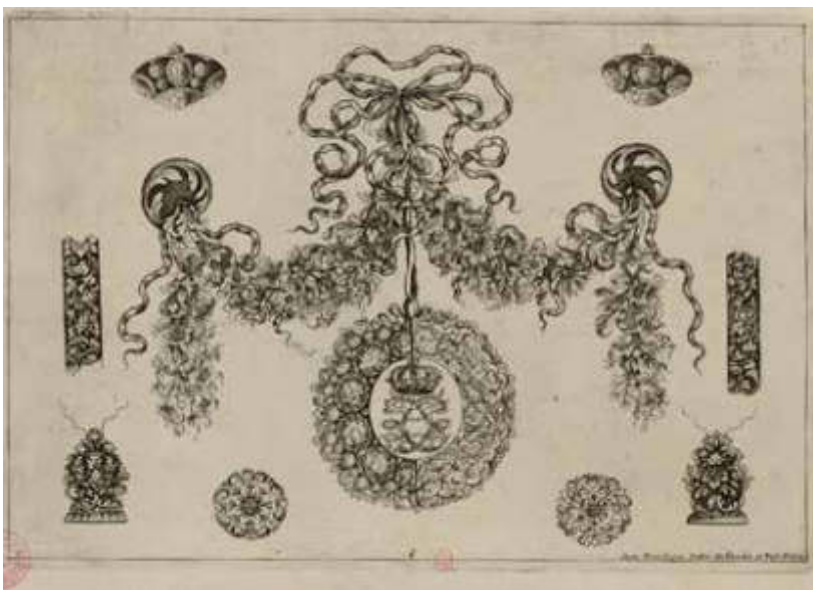
On the left: Charles Le Brun, *A caryatid*, c. 1619-1690, The Morgan Library & Museum, New York.

On the right: Jean I Petitot & Gilles Légaré, *Portrait of Catherine-Henriette d'Angennes, comtesse d'Olonne, as Diana*, c.1680, Philadelphia Museum of Art.

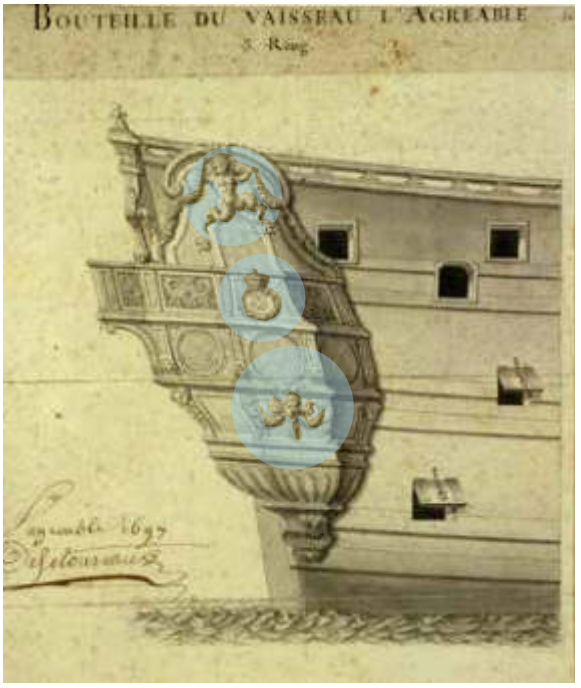
Charles Le Brun, *Frise de divinités marines*, c. 1670, Louvre museum, Paris.

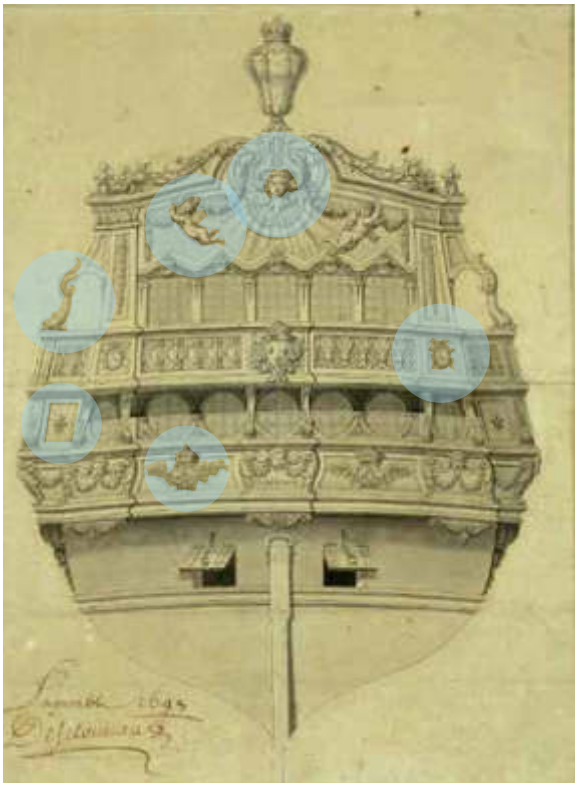


Belle-Veüe d'Augère sieur de René, *Ornements de poupe du Souverain,* 1678, Musée national de la Marine, Brest.



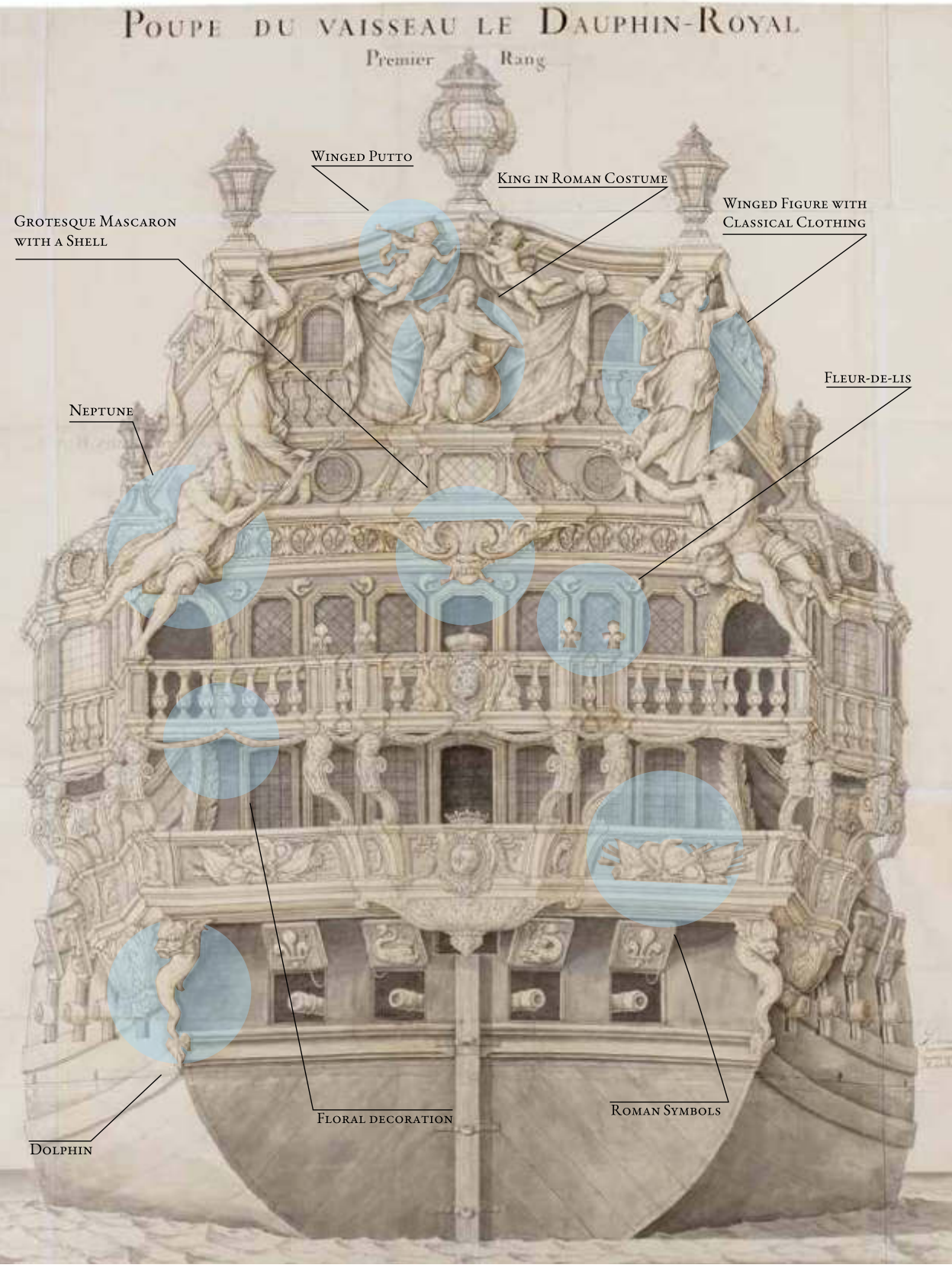
Thomas Lejuge, *Modèles pour la joaillerie et l'orfèvrerie*, plate 6, 1676, Bibliothèque de l'Institut National d'Histoire de l'Art.


Bouteille du vaisseau l'Agreable
3 Rang



Billiard room (buffet room), door in gilded wood opening onto the landing of the former staircase of the Ambassadors of the Palace of Versailles Photo (C) Château de Versailles, Dist. RMN-Grand Palais / Christophe Fouin.

Previous page, drawings and details: Bérain, Jean, *Ornements de bouteille et de poupe du vaisseau l'Agréable*, 1697. Musèe National de la Marine, Paris.


Poupe du vaisseau le Dauphin-Royal
Premier Rang
Winged Putto
King in Roman Costume
Winged Figure with Classical Clothing
Grotesque Mascaron with a Shell
Fleur-de-lis
Neptune
Floral decoration
Roman Symbols
Dolphin

La Poupe et la Bouteille du Vaisseau 'Le Dauphin Royal' premier rang, designed after the model by Girardon, In: Baron Isidore Justin Séverin Taylor, *Naval architecture of France. A collection of 25 large drawings of French Frigates. (...)*, Paris.

Jean Bérain, *Soleil Royal Stern and bow drawings*, 17th century, in: Georges Toudouze et alii, *Histoire de la Marine,* Paris, Les Éditions de L'Illustration, Baschet et Cie, 1959; Tome premier, pp. 148-9.

On the left: Hyacinthe Rigaud, *Portrait of Louis XIV,* 1701, Louvre Museum, Paris.

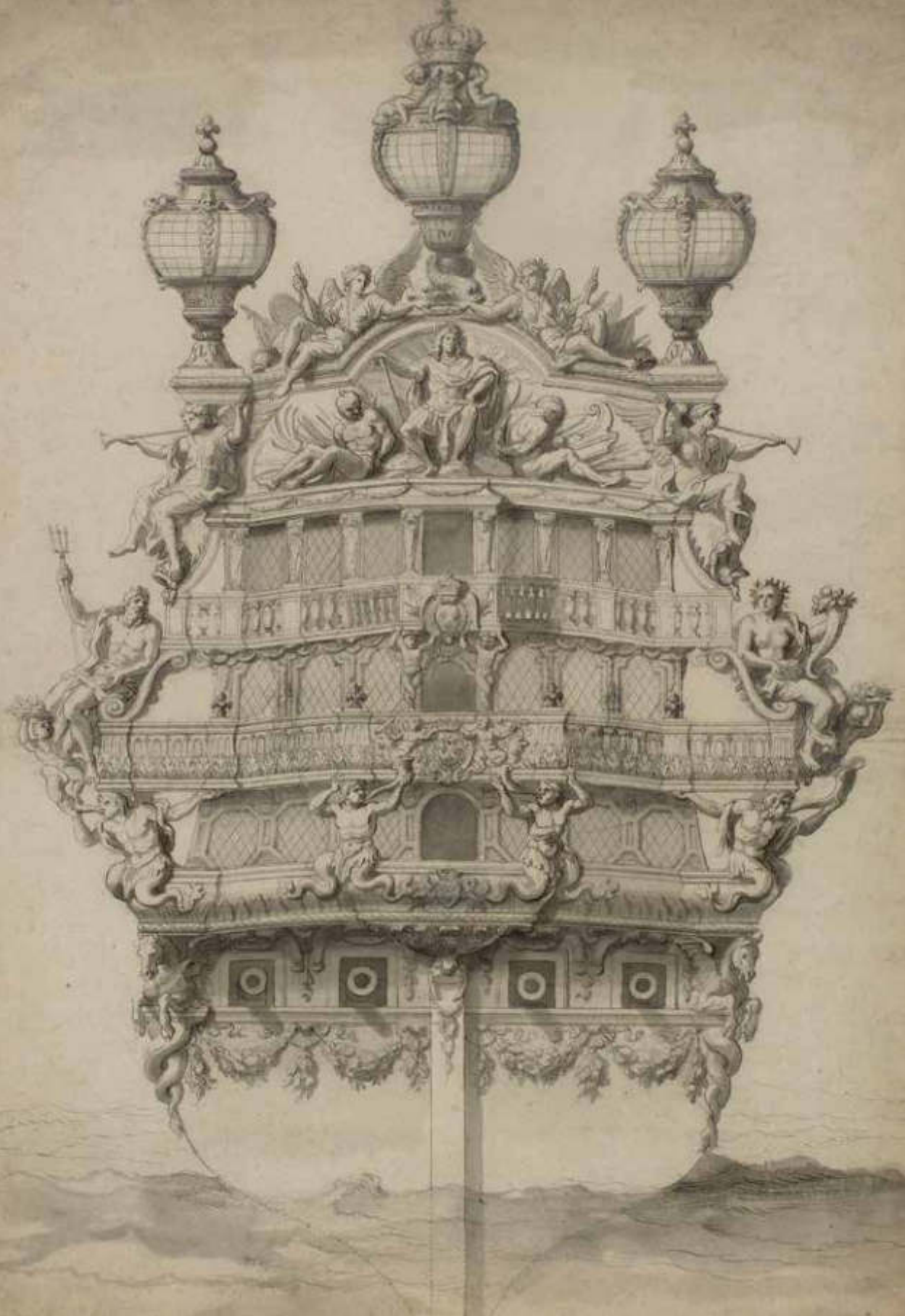
On the right: Fauteuil à la Reine, from the salon of madame de Pompadour au château de Crécy, c. 1755.

Sculpted decoration from one of the gilt Royal Gates of the Royal Courtyard, Versailles, châteaux de Versailles et de Trianon © EPV Christian Milet.

Jean Berain, *Poupe du Soleil Royal*, 1669, Musée du Louvre, Paris.

Jean I Petitot, Adrien Vacherin, *Portrait of Louis XIV*, c.1670-168, 1789, The Walters Art Museum.

Manufactory: Savonnerie Manufactory, Designer: after designs by Charles Le Brun *Carpet with Fame and Fortitude*, 1668–85, The Met Museum, New York.



A case study: the Royal Louis

«Je suis l'unique dessus l'onde, et mon roy l'est dedans le monde.»

«I am the only one [to rule] above the waves, and my king is [the only one to rule] in the world.»

This was the motto written in gold letters on a blue background at the foot of the mizzenmast on the third deck of the first-rate *Royal Louis*. She was the French flagship of the Mediterranean fleet, and one of the first French vessels to be classified as *premier rang*. This vessel can be considered one of the main examples of these fascinating ships made following the French pomp of the 17th century. When the construction started, the intent was to build the largest and most majestic vessel ever made in France, worthy of bearing the name of the sovereign. Her construction began in 1666 under the direction of Rodolphe Gédéon and the result was one of the largest ships ever built in France. She was one of the first French *full three-decker* – that means, she had three full decks totally armed with guns – and was 52.9 m long, 14.40 m wide, with a draft of 7.15 m and a displacement of around 2,400 tons. Its firepower included 16 pairs of guns on the lower deck, 14 pairs of guns on the middle deck and 13 pairs of guns on the upper deck[113] plus other guns located at the stern and bow, for a total of 104 guns. She required 800 crewmen. Her armament exceed other vessels since she had been designed for 110 guns located in decks, forecastle and quarterdeck. And even if the effective number of guns was reduced to 104 bronze pieces of artillery, it still exceed the average, considering that First Rates generally boarded from 70 to 100 guns. For these reasons, she was rated as *vaisseau du premier rang extraordinaire* along with the *Soleil Royal* (1670), her Atlantic counterpart. Thus, they were considered extra-rate vessels and that perception had been strengthened through an Establishment enacted on 4 July 1670, which imposed they had to be the only two vessels with forecastles.[114] The very fact that she was named after the king was credited to her certain supremacy on other vessels. That outcome was the result of a well-planned project, as much for the hull construction as for decoration.

In order to obtain the best decoration design, the intendant of Toulon arsenal d'Infreville decided to organize a contest in which three artists designed different decoration programmes for sculpture, painting and gilding of the vessel and then choose the best. They were the painter Jean-Baptiste de La Rose (1612 – 1687), the sculptors Nicolas Levray, and Rombaud-Languenu (c. 1637 – 1718).[115] The latter, who was then thirty years old[116] and of Flemish origin, was instructed to travel to Paris

In the previous page: Pierre Puget, *Poupe de vaisseau royal le Royal Louis*, n.d., Ecole nationale superieure des beaux-art, Paris.

[115] G. Lambert, "Histoire de Toulon", in *Bulletin de l'Académie du Var*, nouvelle série, Vol. 15, 2° booklet, Toulon, Imprimerie du Var, 1890, p. 324.

[116] L. Lagrange, *Op. cit.*, p. 111.

and submit the three plans to the minister. Nevertheless, all the projects were discarded and the *Premier peintre du Roi* Charles Le Brun (1619 – 1690) was commissioned to project personally the decoration with a non-provincial style and in line with the taste of Versailles. The sculptor François Girardon (1628 – 1715), who was another court artist, was sent to Toulon with the task of overseeing the artistic work, and so under his artistic direction, the *Royal Louis* became one of the most majestic ships ever built, as expressed by the Navy commissioner Hayet, who wrote:

> «On peut dire que jamais aucun Navire n'a esté si enrichy de peinture & de sculpture que cet incomparabile vaisseau.»[117]

«We can say that never has a ship been so enriched with painting and sculpture as this incomparable vessel.»

The artistic work had to be well organized. Artists were divided into five teams, each made of craftsmen and *garcons* (probably young apprentices). Every team had an artist leading the group. In particular, Rombaud-Languenu's team was made of six craftsmen and two *garcons* with the task of producing the sculpture on the starboard side of the bow, while Nicolas Levray was appointed to lead a team of seven craftsmen, two *garcons* – including his son Antoine Levray – and *menuisier* Antoine Aurenge de Soliet (or Solis). His team was commissioned to make:

> «[...] tous les ornemens de la poupe, compris les chevaux marins, le jardin et balustrades, ensemble la sculpture qu'il conviendra faire aux fanaux, et s'assujetir autant quil pourra aux ouvrages de fer qu'il faudra faire pour cet effet.»[118]

«[...] all the ornaments of the stern, including the sea-horses, the *jardin* and the balustrades, together with the sculpture which it will be appropriate to make for the lanterns, and to subject oneself as much as possible to the iron works which it will be necessary to make for this effect.»

On the whole, almost 50 people worked on the realisation of her decoration. Thanks to Hayet's work, it is possible to have a description of the decoration not only of the exterior but also of the inner parts.

External decoration – Like in the other ships, the stern of the *Royal Louis* was one of the most decorated areas and perfectly expressed the artistic pomp of the time. It was decorated with bay leaves, shells and festoons, which were all covered in gold. In the tafferel, Louis XIV was depicted dressed in Roman costume and sat on a throne, crowned by two winged figures holding a Laurel crown. The king had two chained slaves on his feet. The prisoner on the left had his hair tied up in a hairstyle called "topknot" which immediately identified him as a man of Turkish origin. A Turkish slave could have posed as a model for this statue, as in 1668,

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[117] HAYET, *Description du vaisseau le «Royal Louis» Dédiée à messire Pierre Arnoul, conseiller du Roy en ses Conseils, intendant général de la Marine de Levant*, Marseille, Charles Brebion, 1677, p. 25.

[118] C.P. DE CHENNEVIÈRES, *Archives de l'art français*, Vol. 7, Paris, J.-B. Dumoulin, 1856, pp. 237-238.

On the left, detail: Pierre Puget, *Poupe de vaisseau royal le Royal Louis*, n.d., Ecole nationale superieure des beaux-art, Paris.

On the right: Pierre Mignard, *Equestrian Portrait of Louis XIV in Roman armour*, c.1675, Musée des Beaux-Arts de Reims.

On the left: Charles Le Brun, *La Réformation de la Justice*, c. 1674/1689, Louvre Musuem, Paris.

On the right: Charles Le Brun, *Victoire, esclave et trophées*, c. 1674/1679, Louvre Museum, Paris.

Details: Pierre Puget, *Poupe de vaisseau royal le Royal Louis*, n.d., Ecole nationale superieure des beaux-art, Paris.

On the left: Charles Le Brun, *Un esclave*, c. 1674/1679, Louvre Museum, Paris.

On the right: Charles Le Brun, *Esclave tourné vers la droite*, c.1674-1679, Louvre Museum, Paris.

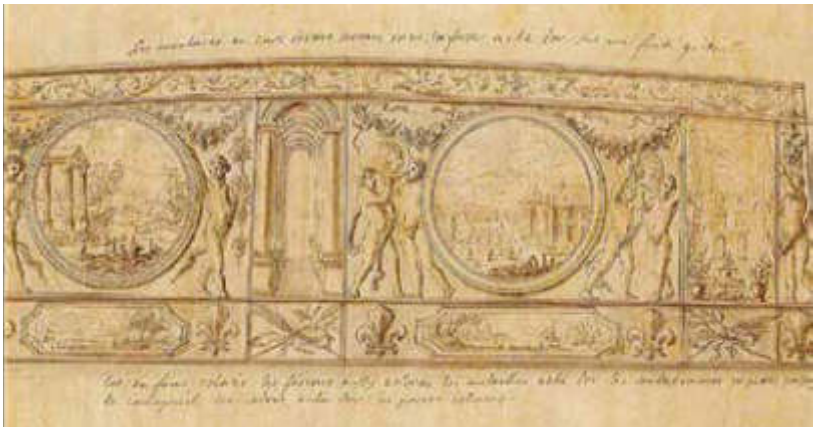
when Le Brun was designing his project for the *Royal Louis* and Colbert sent two "esclave Turque" as models for artist of the Académie Royale in Paris. It is therefore probable that some slaves also posed for the artists of atelier inside shipyards. The decision to represent a Turkish slave close to His Majesty was likely to have a specific reason. War galleys were still being built in the Mediterranean and, therefore, rowing boats still represented an idea of naval power (and some of their elements were carved in the background of these sculptures). In addition, they were fixed in the common imagination as the ships of the great Roman conquerors and the Christian struggle against the infidels during the crusades. This is why the rowing slave was associated with the idea of naval power, a symbol of European domination over the rest of the Mediterranean. Representing Turkish slaves near Louis XIV symbolized his power and also reaffirmed his loyalty to Christianity.[119] This is the only section in which pictures from the current reality of the time were depicted. The rest of the stern was occupied by mythological figures, such as mermaids, divinities, sea horses, and allegories such as the Fame playing her trumpet. All these wooden statues were covered in gold creating an effect of magnificence and wealth. The sides of the ship were equally decorated. There was a golden frame with a floral theme that ran all over the sides, and the gunports were decorated with lilies, suns and the king's monograms; everything was covered in gold. At the bow, an allegory of the Fame supporting the royal coat-of-arms, helped by a small triton, stood out from many decorations.

Detail on the left: Pierre Puget, *Poupe de vaisseau royal le Royal Louis*, n.d., Ecole nationale superieure des beaux-art, Paris.

On the right: Charles Le Brun, *Neptune*, c. 1659/1679, Louvre Museum, Paris.

[119] M. MARTIN G. WEISS, "A tale of two guns. Maritime weaponry between France and Algers", in Fraser Elisabeth A. (Ed.), *The Mobility of People and Things in the Early Modern Mediterranean: The Art of travel*, New York, Routledge, 2019, pp. 27-48.

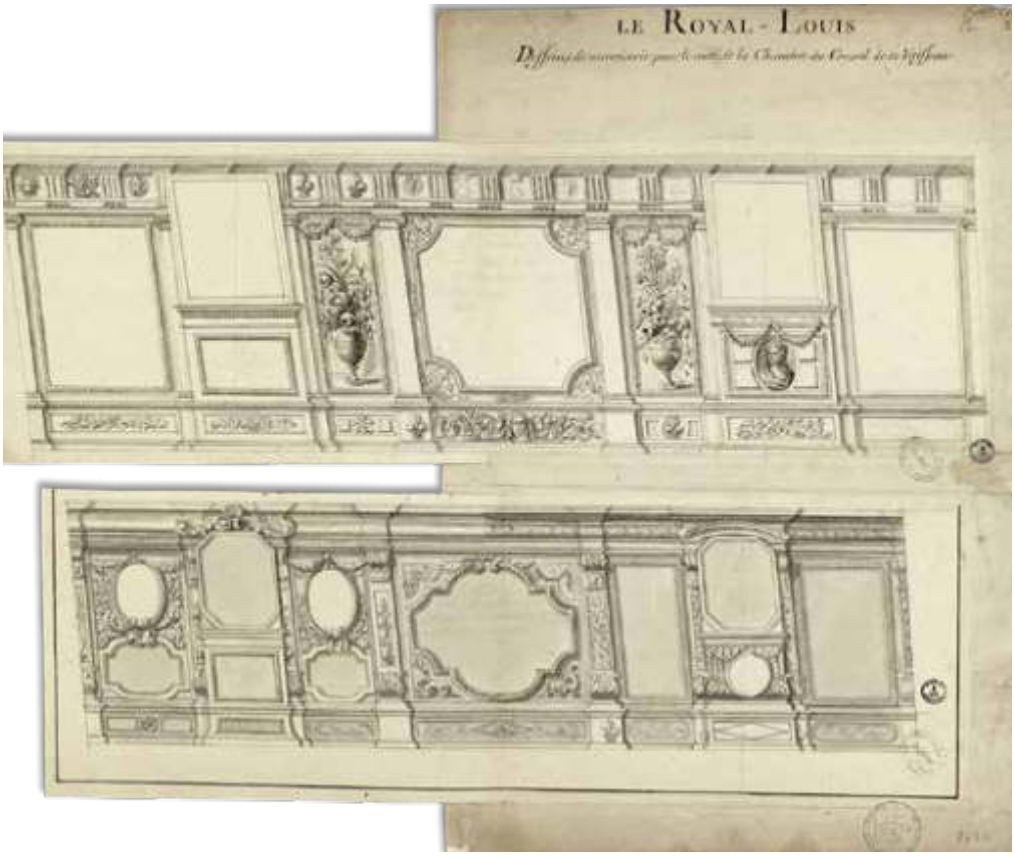
Interiors and furniture – Also the interiors were richly adorned by decorations and paintings. Even inside, Turkish slaves were represented to enhance the superiority of the crew over the enemy. The *saint Barbe* (powder magazine), which was located on the lower deck, was decorated with drawings of fleur-de-lis enriched with gold threads, and the staircase leading to the upper deck had balustrades decorated with painted panels. In the middle deck, there was the *Chambre des Volontaires* (or *Chambre du Conseil;* the great cabin), which was one of the inner areas that most exalted the artistic pomp. On the walls two large frames ran for almost the entire wall; they depicted two scenes from the Apollo and Python story taken from Ovid's Metamorphosis. One depicted Cupid stretching his bow against Apollo, and the other showed Apollo chasing Daphne before



Pascal de La Rose, *Projet de décoration intérieure pour la chambre du Conseil du vaisseau L'invincible*. 1692. c. Galerie Talabardon & Gautier, Paris.

On the left: Charles Le Brun (assigned to), Fontaine de la victoire d'Apollon sur le serpent Python, c. 1665/1668, Louvre Museum, Paris.

On the right: Versailles panel, porte du "Salon de Vénus".



Pascal de La Rose, *Projet de décoration intérieure pour la chambre du Conseil du vaisseau Royal Louis*,1692, c. Galerie Talabardon & Gautier, Paris.

she turns into a laurel. The room was adorned with several small painted panels and surrounded by golden mouldings. Inside a large painting, there were painted the *Armes du Roy* (royal coat-of-arms) supported by tritons and at its side, the coats-of-arms of the owners of the vessel were depicted too. They were de Bourbon duke of Vendôme (1594 – 1665) on the right and his son François de Bourbon-Vendôme duke of Beaufort (1616 – 1669) on the left. The ceiling was painted blue, with the king's symbols in gold, all intertwined with leaves and floral motifs. Also, the floor symbolized the magnificence of the Royal Louis, being made of precious materials such as olive and ebony.[120]

In the mid-deck, the part under the quarterdeck was called *Corps de garde*.[121] Above the entrance of that room, there was a panel with the king's monograms placed above a golden globe. Inside, a large table stood at the centre of the room, whose legs consisted of eight jasper columns, each with its own capital. The ceiling was covered with golden lilies and

[120] HAYET. *Op. cit.*, p. 26.

[121] N. AUBIN, *Dictionaire de Marine contenant le termes de la Navigation et de Architecture navale*, Amsterdam, Pierre Brunel, 1702, p. 279.

crowns, intertwined with leaves in *grisaille*.* On the sides, there were four gunports decorated with *cartouches** and *grisaille*. Large paintings depicting seascapes and other landscapes with golden frames were positioned in the empty space between gunports. The officers' cabins, which were in the aft part of the vessel, were equally rich in decorations. The ceilings were adorned with blue panels with gold and *grisaille* decorations representing royal symbols. Large paintings were hanging on the walls depicting mythological scenes, such as Apollo with satyrs, or portraits of royal people. Finally, the aft part of the upper deck was called *dunette* and hosted the private cabins of senior officers. On the *Royal Louis*, as was common on the biggest warships, the dinette was divided into two areas. The access to the first *dunette* led to a corridor with two room doors on each side, each one decorated with floral decorations and leaves of various colours. Inside the cabins, there was once again the pomp that enveloped the rest of the ship. Wherever the eye looked, it found decorations of leaves enveloping gold lilies and royal initials, generally on a blue background. There were paintings hanging on the walls enclosed in large golden frames, which represented landscapes, military scenes with armies and fleets and naval combats. Raised compared to the first, the second *dunette* had eight small cabins all with interiors decorated and painted in perfect Versailles style and the bulkheads were made of marble and precious olive wood.

** Grisaille*

Artwork painted in shades of grey or of another neutral greyish colour.

** Cartouches*

[Detail of the picture in the previous page] Cartouches are three-dimensional or painted oval frames enriched by floral and articulated ornaments.

Artists in Shipyards

Not only the decoration influenced the aesthetics of vessels but also the life in arsenals. Indeed, arsenals had become quite dynamic places, and, with the increase in demand for decoration, a new professional figure found there their place of work. That was the artist. Indeed, it is thanks to the union between artists and shipbuilders that sailing masterpieces, such as the *Royal Louis*, were born. Since 1660, several artists worked in shipyards to create amazing ships worthy of Louis XIV. For example, in 1668, at Toulon, three big ships were built at the same time. Two of them were the first-rate *Royal Louis* and *Dauphin Royal*, and the other one was the second-rate *Monarque*, carrying 80 guns.[122] In order to organize this new reality, they were divided into teams of minor artists led by those who were the most skilled. These artists in charge were called *entretenus*, and they had to design ships' decorations, supervise the work of craftsmen to ensure a successful outcome, as well as to manage the administrative operations related to works in progress. Often they also had to realize the most important and visible elements by themselves. For instance, the

[122] M.A. De Montaiglon, *Op. cit.*, p. 253.

painter De La Rose made the decorations of the *boiseries* present in the *Chambre du Conseil*.[123] Local and less-known artists were just executors supervised by the superintendents' watchful eye. Less-known artists aspired to become *entretenus* since the government issued a patent, which was a document having the same value as the title issued to the artists of the king by the Académie Royal.[124] Well-known artists were working for the shipyard too; they were not *entretenus* and they had contracts; their job was not exclusively concerned with making the decorations on ships, but they also had other tasks. For instance, Pierre Puget realized drawings showing several French ships moored in harbours.[125] Despite the well-planned organization, the coexistence between naval workers and artists was not easy. Complaints concerned in particular the insubordination of the latter, which, according to the superintendent d'Infreville:

> «[...] ne se gouverne pas comme les autres artisans.»

«[...] they don't behave like other artisans.»

D'Infreville also wrote a letter to Colbert, dated April 21, 1668, saying:

> «[...] je feray bien mon possible pour les tenir en leur devoir, mais il est absolument nécessaire d'avoir un commandant comme le sieur Girardon ou une personne de sa suffisance pour conduire un sy bel ouvrage et assujettir les gens de ce mestier [...].»

«[...] I will do my best to keep them in their duty, but it is absolutely necessary to have a commander like sir Girardon or a person of his standing to lead such a beautiful work and govern the people of this profession [...].»

As evidence of this, the monarchy allowed using the threat of violence to force these craftsmen to work.[126] Nevertheless, during the 17th century, the French monarchy patronised naval art. Consequently, arsenals became centres of attraction for artists, sculptors and painters from all over France. Among them were many prominent artists, such as the already mentioned sculptor Girardon, who was called to work on the *Royal Louis* and the *Dauphin Royal*, in 1667, after finishing a group of sculptures of the Chevaux du Soleil, placed in the Versailles Palace.[127] It clearly shows that ships and architecture not only shared the same style but also the same artists.

Working in French arsenals was appealing even to foreign artists,

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123 N. AUBIN, *Op. cit.*, p. 187.

124 M. THÉRON, "Les ateliers de peinture et de sculpture des arsenaux en Provence en marge de l'Académie de peinture et de sculpture de Marseille", in *Rives méditerranéennes*, 2018/1, no. 56, p. 149.

125 D. LACROIX-LINTNER, "Marine, beaux-arts et mécénat au XVIIe siècle en France", in *124-Sorbonne*, Carnet de l'École Doctorale d'Histoire de l'Art et Archéologie, 2016, pp. 6-8.

126 M. MARTIN, G. WEISS, *Op. cit.*, p. 30.

127 R.A. WEIGERT, *L'époque Louis XIV*, Paris, Presses Universitaires de France, 1962, p. 85.

especially from Flanders and Italy. The migration of artists to French naval production poles meant that:

> «[...] entre 1670 et 1680 plus de quatre-vingts sculpteurs et cinquante-cinq peintres se côtoyèrent ainsi à l'arsenal de Toulon, faisant de la ville l'une des plus peuplées de France en nombre de peintres et sculpteurs par habitant.»[128]

«[...] between 1670 and 1680 more than eighty sculptors and fifty-five painters gathered in the arsenal of Toulon, making the city one of the most populated in France in terms of the number of painters and sculptors. per inhabitant.»

Moreover, the massive introduction of artists into arsenals had an important echo in the artistic field as well. At that time, shipbuilding was still largely entrusted to skilled shipwrights, who knew by experience how to build vessels. Although shipbuilding treaties were beginning to be widespread, thanks also to the impulse of the press, there was not a real phase of design and study of ships yet. That means, that in those early treatises, the drawing was used to explain how to make the individual elements manually but was not yet part of the actual construction process. Shipbuilders did not draw ship elements before making them but they relied on their empirical knowledge and experience to translate the raw material into construction parts. In this context, the introduction of skilled artists into the world of arsenals can be considered a boost to the growth and progress of shipbuilding. Indeed, in order to make statues and decorations, artists previously prepared sketches, which were preparatory drawings, and thus artists working in arsenals began to produce different drawings of sterns, bows and profiles of ships. This method, which was typical of the art world but unknown by shipwrights, was then introduced in shipyards and ships, or at least their external parts, slowly began to be drawn *before* they were built. Colbert did not miss the great advantages obtainable thanks to graphic processing. Having understood the potential of drawings, he began to request that all artists send their sketches, creating collections and leading toeading to a systematization of the transposition of ships on paper. Colbert also had to deal with a king who was not particularly interested in naval affairs. Louis XIV was not used to frequent ports and arsenals, and so Colbert decided to show the naval world to him through a « tableaux de l'armée navale »[129] made on purpose by De la Rose. Then, Colbert went further ordering to both Puget and De la Rose to create a collection of drawings illustrating all the elements of a galley or showing «Tous les bâtiments de la Méditerranée». The practice of creating albums containing the ships types remained a trend in use even many years later, as the *Collection de toutes les espèces de bâtimens de guerre et de bâtimens marchands qui naviguent sur l'Océan et dan le Méditerranée* (c. 1810) by Jean-Jérôme Baugean (1764 – 1819)

[128] M. Théron, *Op. cit.*, p. 150.

[129] C. de La Roncière, *Op. cit.*, p. 331.

Pierre Puget, *A ship in a port near a ruined obelisk*, c.1675-80, J. Paul Getty Museum, Los Angeles.

shows. Given the tendency to catalogue ships by drawing and in order to have uniformity in the information acquired, the next step was the formal standardization of these catalogues. The drawing was becoming a detailed tool for investigating reality and the naturalistic and pictorial approach was slowly being supplanted by a more geometric vision accompanied by scales and measures. This process did not only concern the naval world but it took place in architecture too.[130]

The new trend also led to changes in the process of acquiring workers. Indeed, the idea of training workers in the art of drawing directly in arsenals, eliminating an external presence, soon began to circulate. In 1672, Girardon sent 948 books of «modèles de plâtre, dessins et estampes»[131] to the ports of Toulon, Marseille and Brest so that artists could have useful texts for their training. Over time, arsenals were even equipped with structures for teaching art, drawings and graphic representations, arriving to train future ship designers (as much as it may be premature to use this term) on site. During the second half of the 17th and early 18th centuries, this innovation in the naval world led to the founding of a school of engineers and shipbuilders in 1741, thanks to the initiative of Henri-Louis Duhamel du Monceau (1700 – 1782), another great leader of the French Navy after Colbert.

In the next pages, parts of: Henri Sbonski de Passebon, *Plan de plusieurs bâtimens de mer avec leurs proportions...*, Marseille, L. Brémond, 1690. Source gallica.bnf.fr / Bibliothèque nationale de France.

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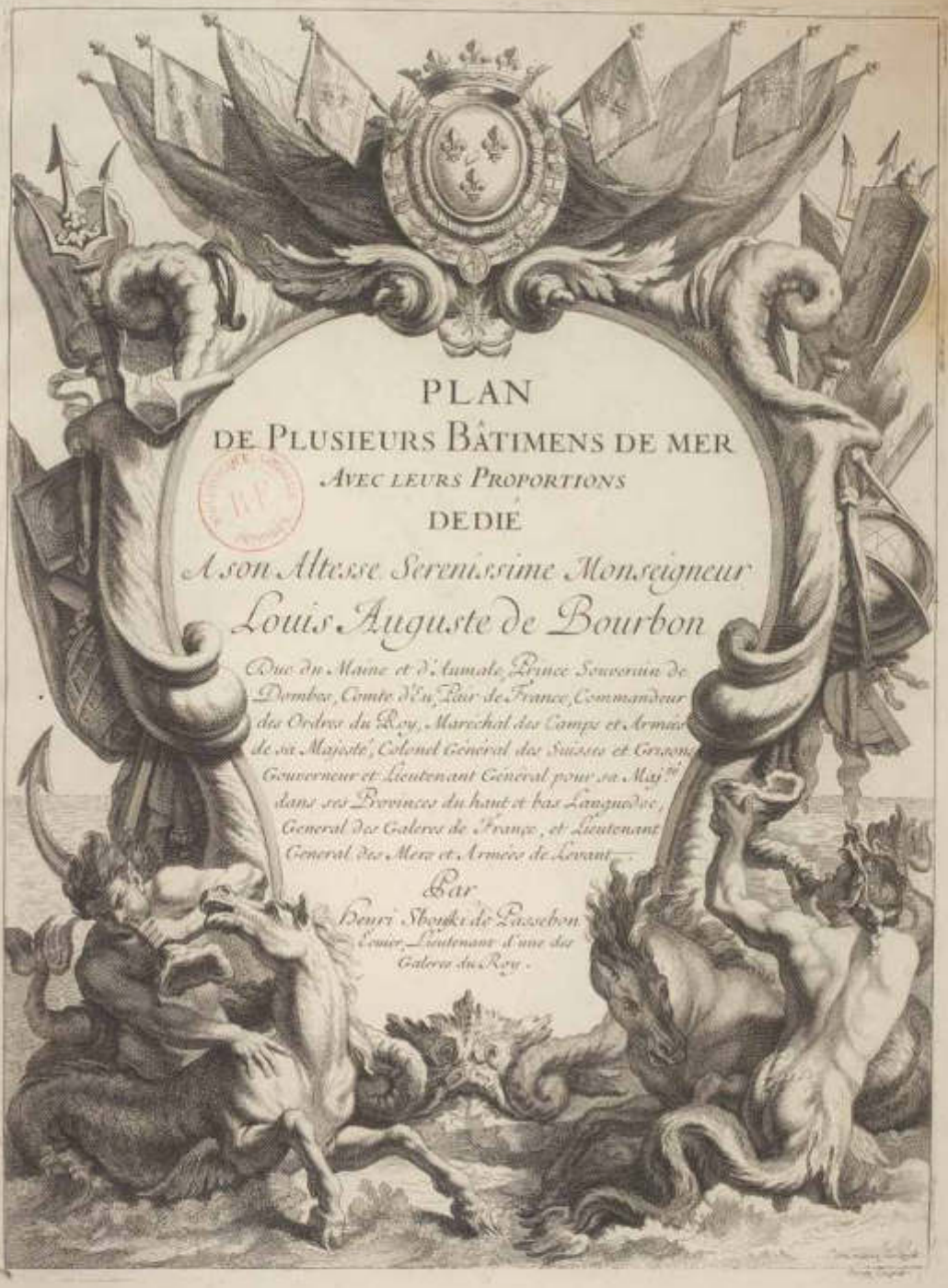
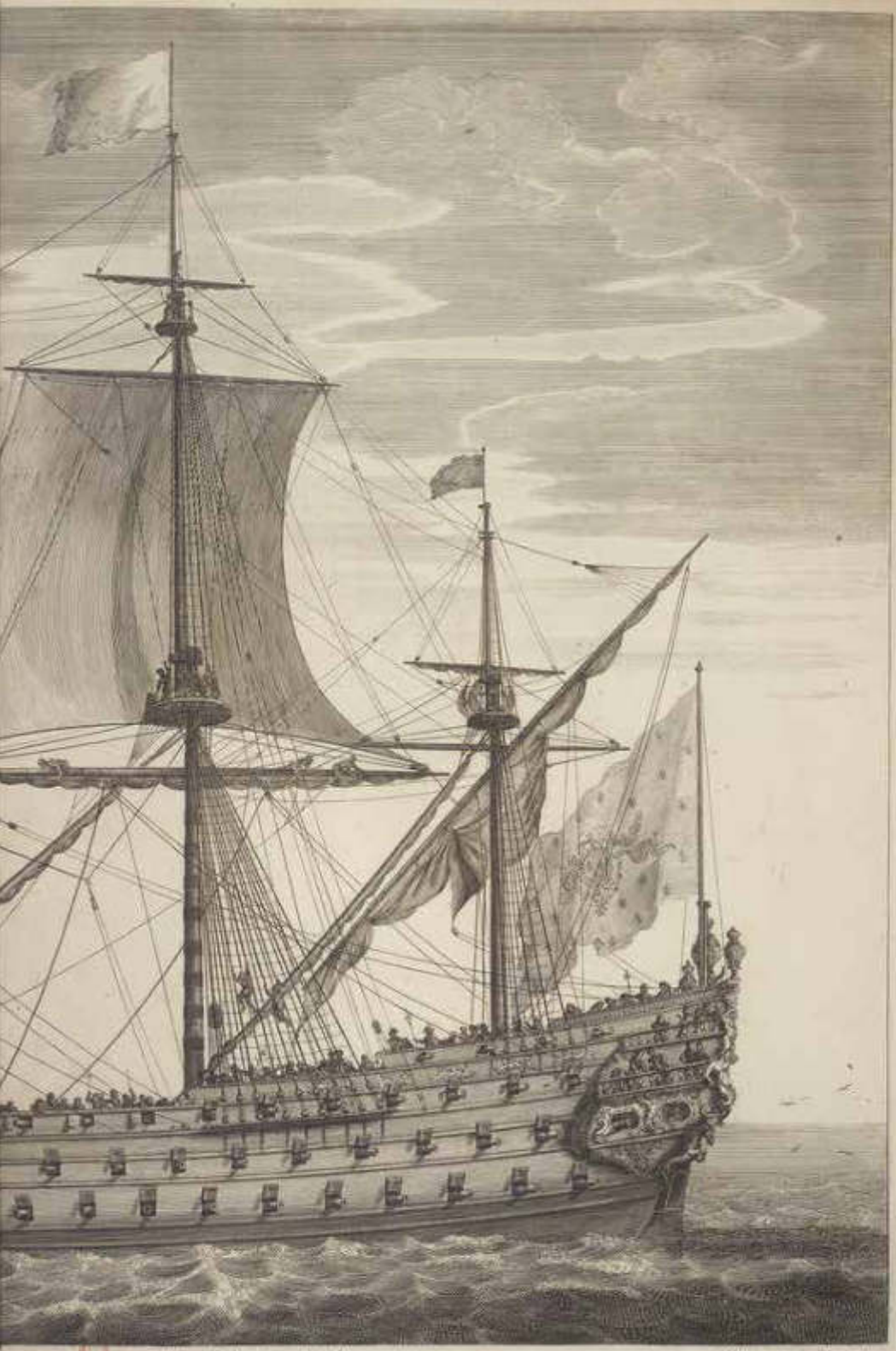
[130] M. Théron, *Op. cit.*, p. 152.

[131] M. Théron, *L'ornementation sculptée et peinte des vaisseaux du Roi*, T. 1, Paris, Université de la Sorbonne, 2003, pp. 81-83.


PLAN
DE PLUSIEURS BÂTIMENS DE MER
AVEC LEURS PROPORTIONS
DEDIÉ
A son Altesse Serenissime Monseigneur
Louis Auguste de Bourbon
Duc du Maine et d'Aumale, Prince Souverain de Dombes, Comte d'Eu, Pair de France, Commandeur des Ordres du Roy, Marechal des Camps et Armées de sa Majesté, Colonel Général des Suisses et Grisons, Gouverneur et Lieutenant Général pour sa Majté dans ses Provinces du haut et bas Languedoc, General des Galeres de France, et Lieutenant General des Mers et Armées de Levant.
Par
Henri Sbonkes de Pazebon
Escuier, Lieutenant d'une des Galeres du Roy.

[illegible] delineavit et sculpsit, Cura [illegible] Equitis

Vausseau du premier rang



portant pauillon d'Admiral

4. *Sailing masterpieces*

How decoration affected the life of warships

In the new generation of ships of the line, the pragmatism of the technique had to give way to aesthetic flair. However, the coexistence between the two aspects that made up shipbuilding, namely aesthetics and functionality, was not easy. Indeed, the accentuation of decorations aboard gave rise to new problems that negatively influenced the entire life of ships, from the construction process to the nautical performance after launch.

Timing – The time required for construction was considerably extended to allow artists to make, paint and gild their creations. For instance, during the construction of the French warship *Monarque*, at the Toulon arsenal, the duke of Beaufort, complained to Pierre Puget, the artist in charge of the decoration, because the time needed to finish the vessel was getting longer. And he told to Puget:

«You will see that the gallery of this ship will not be made when I have to leave.»

> «Vous verrez que la galerie de ce vaisseau ne sera pas faite lorsque je serai obligé de partir.»[132]

The artist's answer was:

«If your highness is not satisfied with my services, please discharge me.»

> «Si votre altesse n'est pas contente de mes services, je la prie de me donner mon congé.»[133]

Following this argument, it was the duke who had to apologize to Puget and beg him to go back to work on the stern of the vessel, which was then finished in a few months. In an ironic twist of fate, the duke died on the *Monarque* during the Siege of Candia (1669) when he was leading a French squadron, armed under the papal flag, composed of 16 vessels.[134] Nevertheless, more than the time needed for its construction, the decoration was influencing other two important aspects of shipbuilding: costs and seaworthiness of ships.

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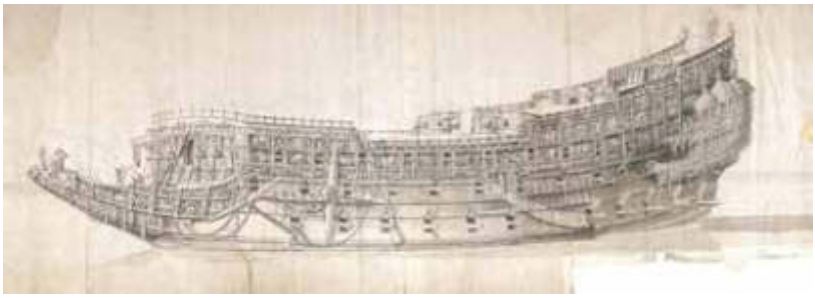
[132] *Gazette des beaux-arts*, Vol. 19, Presses Universitaires de France, 1865, p. 233.

[133] G. PLANCHE, *Revue des Deux Mondes, Nouvelle période*, tome 15, Paris, 1852, pp. 782-799. The text refers to a vessel of 104 called *Magnifique* but this is most likely an error, as the first French ship of the line *Magnifique* (carring 72) was launched in 1685, when the duke was already dead on the *Monarque*.

[134] R. WINFIELD, *Op. cit.*, 2017, p. 25; J.M. ROCHE, *Commandants, états-majors et activité des bâtiments de la Marine française*, Tome 1, 1661-1689, Février 2019, pp. 15-16.



Willem van de Velde, the Elder, The so-called Morgan drawing depicting the *Sovereign of the Seas*.

Costs – Costs of construction increased significantly, having to include the price of the material for the statues, generally made of precious wood and covered with gold leaf, the material for the other decorations, and the salaries of artists. The *Prince Royal* was decorated with gilding and painting which costed £868.[135] The *Sovereign of the Seas,* commissioned in 1634 to the shipwright of Woolwich Peter Pett (1610 – 1672) by Charles I, was excessively expensive. On the total amount of £65,000, her lavish decorations alone costed £6,691,[136] reaching the amount of a medium-sized warship.[137] In 1637, the year of her launch, in order to cover the expense, the tax known as Ship Money, reintroduced by the sovereign in 1634 to support a new shipbuilding programme, underwent an excessive increase and was extended to the population of non-residents in coastal areas. That led to general discontent among the population and the parliament. Clearly, since England was a constitutional monarchy, the sovereign did not have full control of the national treasury; consequently, the Admiral forced a decrease in ship decoration, and furtherance, proposal to build a vessel would not have been accepted if the cost of excessive decoration aimed at glorifying the monarchs had been high.[138] The Commonwealth introduced as a "measure of austerity" the substitution of gold leaf instead of gold paint but, when Charles II launched the *Britannia* (1682), her decoration in Baroque style costed £895.[139] Moreover, while the price of labour could be relatively low for minor artists, it rose considerably when renowned artists were called. When Charles II promoted a construction programme of royal yachts, he called the most skilled marine painters of the time, the Van de Veldes, commissioning them a set of panel to hung inside the yachts for the amount of £74.[140]

Another example is the *Royal Louis*. During the initial contest held for selecting an artist to design her decoration, the three participants proposed

[135] J.D. Davis, *Op.cit.*, pp. 26-27.

[136] *Ibidem*, pp. 32 and 78.

[137] L. Paine, *Op. cit.*, pp. 166-167.

[138] R. Winfield, *Op.cit.*, 2009, pp.5-6.

[139] J.D. Davis, *Op.cit.*, p. 78.

[140] *Ibidem*, p. 82.

projects and estimated a price for their work. Levray and Rombaud-Languenu calculated sums respectively of 13,800 and 11,000 livres and De La Rose presented a project who costed 21,300 livres for the sculpture alone, which were enormous amount of money for decorating a vessel at the time.[141] Finally, Charles Le Brun, *Premier peintre du Roi*, was called for her decoration design. In a letter from the superintendent d'Infreville addressed to Colbert, dated 4 November 1667, the estimated cost for the realization of «sculptures, dorures et peintures des trois desseins par eux dressez de la poupe» are reported. De La Rosa's work costed 37,060 *lire* [*i.e.* livre tournois*], of which 21,300 *lire* were for sculptures and 15,760 *lire* for the payment of materials, including painting and gold to cover the ornaments, and workers' salaries. For Rombaud Langrune's design, the total amount was 25,850 *lire* and again 23,800 *lire* for the work of Nicolas Levray. A total of almost 89,000 *lire* which concerned only the expenses for the artists' work.[142] In 1677, ten years after D'Infreville's letter, when the coin had undergone changes in its value, a published text reported that the overall cost of the vessel was 65.800 *livres* of which 20.000 *livres* to pay for sculptures and paintings and 27.000 *livres* spent for carpentry.[143] Although it would make no sense these costs to the present value of currency, to understand its value it is possible to observe that the cost of decorations was almost equal to the cost of carpentry. It shows that the aesthetic value of ships and the value attributed to the efficiency in navigation were placed on the same level of importance.

France did not properly have a body that could restrain the amount of money spent on decoration. Indeed, as aforementioned, this power was in the hand of the Secrétariat d'État de la Marine Colbert, who managed the *contrôle général des finances*. From 1669, he also became Secrétaire d'État de la Maison du Roi, so administrating the Bâtiments du roi, which means the general direction of "buildings, arts, tapestries and manufactures of France". Thus, he could work synergistically in different fields and thanks to his autonomy in economic management, he was able to afford the high cost of shipbuilding.[144]

Finally, it is also easy to imagine that not only the price of construction, but also that needed for the maintenance and restoration increased due to precious decoration.

Performance – The increasing number of heavy decorations aboard also influenced the seaworthiness of ships. Indeed, the presence of ornaments

* *Livre tournois*

The *lira* was a coin. From a piece of metal with a fixed weight a precise number of coins were made. Its value was determined by the relationship with the weight of the metal and the number of coins. Since weights units did not coincide in different areas of the country, coins with different values existed. To distinguish them, the geographical place of origin was combined with the prefix *livres*. The two most used were the *livres parisis* (lp) and the *livre tournois* (lt). From 1667, the *livres parisis* was eliminated and, from 1720, the coin was commonly called *livres*.

[141] MINISTÈRE DE L'ÉDUCATION NATIONALE (Ed.), *Réunion des sociétés des beaux-arts des départements*, Paris, Typographie de E. Plon, Nourrit E., 1877, p. 307.

[142] M.A. DE MONTAIGLON, *Op.cit.*, pp. 233-35.

[143] HAYET, *Op. cit.* p. 11.

[144] C. de LA RONCIÈRE, *Op. cit.*, p. 337.

Deatil of: Jan Karel Donatus Van Beeck, *La jonction de la flotte française commandée par l'amiral d'Estrées et la flotte anglaise commandée par le duc d'York, avant la bataille de Solebay*, 1672, Musée National de la Marine, Paris.

resulted in an increase in volume, creating resistance to motion, and at the same time an increase in weight, which in turn increased the immersion of the hull, again creating resistance to motion, reducing the speed of ships and also considerable problems in navigation in shallow waters, as could happen during port entry and exit operations. Furthermore, the combination of castles, made higher by decorative elements, and greater drafts also caused an increase in the rolling phenomenon, making ships more unstable and less manoeuvrable. To stabilize vessels and reduce the lurch, heavier weights had to be in the lowest deck to stabilise the vessel. This meant that larger calibre guns should be collocated in lower decks. However, by adopting this solution, all those cannons could not be used in the rough sea, and they were less efficient even in good sea conditions. Vessels with deep draughts also had two more problems; they could run aground in shallow waters, and harbour approaches were more difficult. These problems were already evident in England during the reign of Charles I. In 1634, the shipbuilder Edward Boate built at Woolwich the warship *Unicorn*. After the launch, she proved to be unsatisfactory for an excessive tenderness of her sides and The Masters of Trinity House concluded that:

> «Since she is too high for her breadth, her upper works need to be taken down.»[145]

On 12 of June 1634, when questioned about the issue, Boate wrote to the secretary to the Council Edward Nicholas (1593 – 1669) about how to improve *Unicorn* performance and among other suggestions, such as "to girdle her between the wales" he also suggested to

> «take away such other works as are rather for ornament than strength or

[145] Letter dated 4 June 1634. Masters of Trinity House and shipwrights to the principal officers of the navy. "Transactions - vol. 2: 1634", *Trinity House of Deptford Transactions, 1609-35*, in G.G. Harris (Ed.), London, London Record Society, 1983, pp. 128-143. British History Online http://www.british-history.ac.uk/london-record-soc/vol19/pp128-143 [accessed 18 December 2022].

Next page: Jonathan Richardson; Michael Dahl, *Fisher Harding, Master Shipwright, active 1664-1706, with the Launch of the 'Royal Sovereign', 1701*, c. 1701, National Maritime Museum, Greenwich, London, Caird Collection.

> convenience [...] by which way of help at least twelve ships now remaining in the Navy have been relieved for the same tenderness of side.»[146]

Similarly, *Sovereign of the Seas*' performance was greatly impaired by her heavy superstructures and so, in 1651, the vessel was returned to Chatham and her height was reduced.[147] As a result of these problems, the initial push in favour of the aesthetics of vessels shared by the European powers soon faded away, becoming a cause for debate in shipyards. English shipwrights began earlier to decrease decoration, as shown by the *Royal Sovereign* built in 1697 by Fisher Hardling (Unk – 1705) at the Woolwich dockyard and launched in 1701. Actually, the sides of this vessel were almost unadorned, such as the bow.[148] However, the stern part was still highly decorated with elaborately carved ornaments and the expensive realization led the Admiralty to decide to limit carving and sculpture presence aboard. Moreover, both Charles II and James II were keen on naval affairs and were interested in the decoration of warships and their seaworthiness as well.

The situation was quite different in France. Firstly, Louis XVI was not an expert in naval affairs and even if he attended the Conseil de Marine's meetings, he did not have the technical skills to make decisions; the King thought of vessels mainly as a means of political propaganda.[149] Colbert was satisfied with French warships beauty, but when Etienne Hubac returned from Great Britain and told him that the English were reducing the galleries on sides of the stern and diminishing the volume of sculptures, he wrote, on 19 September 1670, to the intendants Matharel (at Toulon) and Du Seuil (at Brest):

> «Il faudra éviter les défauts qui se rencontrent dans la poupe du Royal-Louis où l'on a remarqué que ces grandes et pesantes figures ne peuvent que l'embarrasser dans sa navigation. J'advoue qu'il faut que les ornements répondent à la grandeur et à la magnificence du Roy qui paroist en ces superbes corps de bâtiments; mais il faut aussi qu'ils ne soient pas incommodes».[150]

«It will be necessary to avoid the defects which are found in the stern of the *Royal Louis* where it has been noticed that these large and heavy figures can only embarrass her in her navigation. I admit that the ornaments must correspond to the grandeur and magnificence of the King who appears in these superb ships; but they must also not be inconvenient».

It was the comparison with English and especially Dutch vessels that pushed admirals and captains to complain about the decoration of their

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146 J. BRUCE, *Calendar of State Papers, Domestic Series, of the Reign of Charles I*, London, Longman, Brown, Green, Longmans, & Roberts, 1864, p. 73.

147 R. WINFIELD, *First Rate: The Greatest Warships in the Age of Sail*, Annapolis, Naval Institute Press, 2010, pp. 13-17.

148 R. WINFIELD, *Op. cit.*, 2010, p.45.

149 D. DESSERT, *Op. cit.,* pp. 19- 20.

150 R. COUFFON, *La Sculpture au Port de Breste aux XVII et XVIII Siècle*, Saint-Brieuc: LesPresses Bretonnes, 1951; p. 2.

warships. In support of their theories, they cited as an example the most recent foreign warships in which the decorative apparatus had been reduced and the bulky galleries on the stern were absent. These were particularly despised because they considerably increased the wooden volume which, in addition to weighing down ships, also made them more vulnerable to attacks from fireships. Many captains of lower-rate vessels, which were not under the watchful eye of the monarchy, often jettisoned many ornaments, preferring to sail a good ship than a beautiful one.[151] The naval officer Guillaume d'Almeras, marquis of Mireval (1610 – 1676) was one of the most fervent opponents of ship decoration. In a memorandum to Colbert, he asked for the elimination of galleries and added a comment in which he said that the King would do better to pay Puget to stay outside the arsenal.[152] However, while England went further by following the Dutch example of abolishing the projecting galleries and decreasing the decoration, many French naval officers did not agree with that position. Indeed, Louis de Matharel (1619 – 1673), Grand-maître et chef et Surintendant général de la navigation et commerce de France from 1666 and naval intendant of Toulon succeed to D'Infereville in 1670, wrote a letter to Colbert dated June 26, 1671 stating that

> «si M. d'Alméras a trouvé les dessins défectueux en quelque chose, la plupart des autres capitaines n'ont pas été de ce sentiment; e il est certain que le sieur Puget donne un tour à ses dessins qu'on ne voit point chez les autres nations».[153]

«if Mr. D'Almeras found the drawings to be faulty in anything, most of the other captains did not agree; and it is certain that Sieur Puget gives a twist to his drawings that we do not see in other nations».

It is also interesting that in a letter dated 5 September 1670, Matharel seemed to be not such a great supporter of artists working for the navy, as he was writing to Colbert:

> «les sculpteurs de la marine s'attachaient plus aux règles de leur art et à la démangeaison de faire de belles figures qu'au besoing, commodité et service du navire».[154]

«naval sculptors were more attached to the rules of their art and to the desire to make a good impression than to the need, comfort and service of the ship».

Opponent opinions led French shipbuilding to slightly decrease decorations, reducing both the costs and weight of vessels. Only in the 1670s, with the act of Colbert (13th of September 1673), with the aim of bringing French shipbuilding into line with foreign shipbuilding, a reduction of decorations was required,g forbidding figures in relief in the

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151 R. WINFIELD, *Op. cit.*, 2017, pp. 4-5.

152 V.F. BRUN, *Op. cit.*, p.20.

153 MINISTÈRE DE L'INSTRUCTION PUBLIQUE, *Revue des sociétés savantes des Départements*, Paris, Paul Dupont, Vol. 1, 1863, p. 116.

154 R. COUFFON, *Op. cit.* pp.1-2.

stern ornaments and allowing only light elements that did not overload ships.[155]

Activity of a flagship

Beyond attracting criticism and praise for decoration, what was the actual use of these sailing masterpieces? Was their firepower really exploited in sea battles or was the decoration the real weapon that they were carrying aboard? In order to answer these questions, it can be useful to compare the activities of the 17th-century flagships, which were the most lavish warships of all fleets, and fully embody the spirit of the time. The following paragraph describe the activities of some European Flagships.

Royal Louis – Contrary to what one might think, the life of this majestic vessel was almost free of war events. She was built for the duke of Beaufort, who was Henry IV of France illegitimate grandson and Louis XIV's cousin, and should have left for a naval campaign in the Mediterranean right after her launch but remained anchored in the port due to the death of the duke in 1669. On 11 May 1677, she left for her first military campaign as flagship of the admiral Abraham Duquesne sailing to the port of Messina (Sicily, Italy) to support rebels against Spanish control. Except for this action, she missed all the actions in the Mediterranean Sea. Instead, the 80-gun *Sceptre* was flagship of admiral Louis-Victor de Rochechouart, Duc de Vivonne (1636 – 1688) at the first Battle of Stromboli (11 February 1675) and at the Battle of Palermo (3 June 1676), and flagship of the Commandant d'Escadre De Tourville in the second Battle of Stromboli (8 January 1676) and in the battle of Augusta (22 April 1676); Duquesne used the 72-gun *Saint Esprit* as his flagship at the second Battle of Stromboli, in the Battle of Augusta, and in the Battle of Palermo. Duquesne did the same during the French-Algerian war (1681-88), in particular during the two Bombardment of Algiers (1682 and 1683).[156] In 1683, the English shipbuilder Edmund Dummer (1651 – 1713) visited the arsenal Toulon and saw the *Royal Louis*. He described her with these words:

> «great ship and glorious in her first carving, no doubt; but to my judgment not of good proportion, nor good workmanship, her figure under water I

[155] V.F. Brun, *Op.cit*, pp. 19-21.

[156] R. Winfield, *Op. cit.*, 2017, pp. 28-29.

know not, nor is that above to be admired.»[157]

In 1691, the *Royal Louis* was taken out of service and renamed *Royal Louis Vieux* in 1692, as a new vessel that was to become the new flagship, also called *Royal Louis*, took service. Five years later, in 1697, she was finally demolished.

Soleil Royal – In 1671, the *Soleil Royal* was launched in Brest and she was the flagship of the French west fleet. Built by shipwright Laurent Hubac (1612 – 1682), she carried 104 guns, with a crew of 1200 men. Her sumptuous decorations made her one of the most beautiful and majestic ships in full Baroque style. Despite her launch in 1671, she did not take part in the Battle of Solebay* and the flagship of the fleet was the 70-gun *Terrible* commanded by Duquesne. The next years she was not even present at the Battles of Schooneveldt* and the Battle of Texel,* when in both naval battles the flagship of Vice-Amiral Jean, Comte d'Estrées was the 104-gun *Reine*.[158] Only in 1690, she participated in her first campaign, when the French fleet tried to land on English shores in an attempt to restore James II to the throne. On that occasion, the *Soleil Royal* was the flagship of the fleet, commanded by the French admiral Anne Hilarion de Tourville (1642 – 1701). On 29 May 1692 there was the first sighting at first light of dawn, but the clash did not begin until 10 in the morning.

Jan Karel Donatus Van Beecq, *Une navigation en Méditerranée, galère et vaisseau de France devant une côte rocheuse*, 17th century, Collection du Yacht Club de France.

[157] C. Fox, "The Ingenious Mr Dummer: Rationalizing the Royal Navy in Late Seventeenth-Century England", in *Electronic British Library Journal*, 2007, p. 17.

[158] R. Winfield, *Op. cit.*, 2017, p. 26.

Initially with the wind in favour, Tourville was able to keep up with the enemy fleet. For several hours the two fleets continued to fight each other. From 16:00 a thick fog halted the fighting which could only resume at 18:00. By 22:00 the engagement was practically over and although many of the ships were damaged, neither side had lost any units. On 30 May, after a day's fighting, the *Soleil Royal* was in very bad condition, so that during the evening, the admiral transferred his flag to *Ambitieux* (1680), and the ex-flagship was beached together with the two ships on *Admirable* and the *Triomphant* in Cherbourg. These three vessels were destroyed by the British Vice-Admiral Sir Ralph Delaval (c.1641 – c.1707) with the use of incendiary fires. The operation took the name of Action at Cherbourg and the three warships, including the *Soleil Royal*, were completely destroyed. And so it was that her first military campaign was even her last one in her 20-years life.

Sovereign of the Seas – Launched in 1637, she did not take part in any naval campaign for almost 15 years and, in 1651, due to stability problems she returned to Chatham where her superstructures were reduced. On 28 September 1652 under captain Nicholas Reed she participated her first action, in the Battle of the Kentish Knock[159] and there she ran aground in the Kentish Knock itself. During the Commonwealth years she became the flagship of Robert Blake, but she did no take part in any action. Instead, Blaked commanded the *James* (1634) in the Battle of Dover* and the *Triumph* (1623) in the Battle of Portland*.

In 1660, she was rebuilt and renamed *Royal Sovereign.* With the new name, she took part to several actions. In 1666 she participated to the Four Days' Battle,* then during the 1670s she was present at the Battle of Solebay, the First Battle of Schooneveld, the Second Battle of Schooneveld, the Battle of Texel. She was rebuilt again in 1685 and then took part in the beginning of the War of the League of Augsburg against Louis XIV of France and in particular participated in the Battles of Beachy Head* and of Barfleur.* On 29 January 1696 she was burnt by an accidental fire[160] that destroyed her to the waterline.

Royal Charles (1660; ex. *Naseby*, 1655) – The new English flagship after the Restoration was the 80-gun *Royal Charles*. She took part in the Second Anglo-Dutch War as Duke of York's flagship during the Battle of Lowestoft.* Then, she became flagship under George Monk and took part in the Four Days' Battle. In 1667 she was captured by the Dutch

** Dates of naval battles mentioned in these pages in chronological order:*

Dover, Battle of
29 May 1652

Portland, Battle of
28 Feb.-2 Mar. 1653

Gabbard, Battle of
12-13 June 1653

Scheveningen, Battle of
10 August 1653

Sound, Battle of the
8 November 1658

Lowestoft, Battle of
13 June 1665

Four Days' Battle
4 June 1666

Solebay, Battle of
7 June 1672

Schooneveldt, first Battle of
7 June 1673

Schooneveldt, second Battle of
14 June 1673

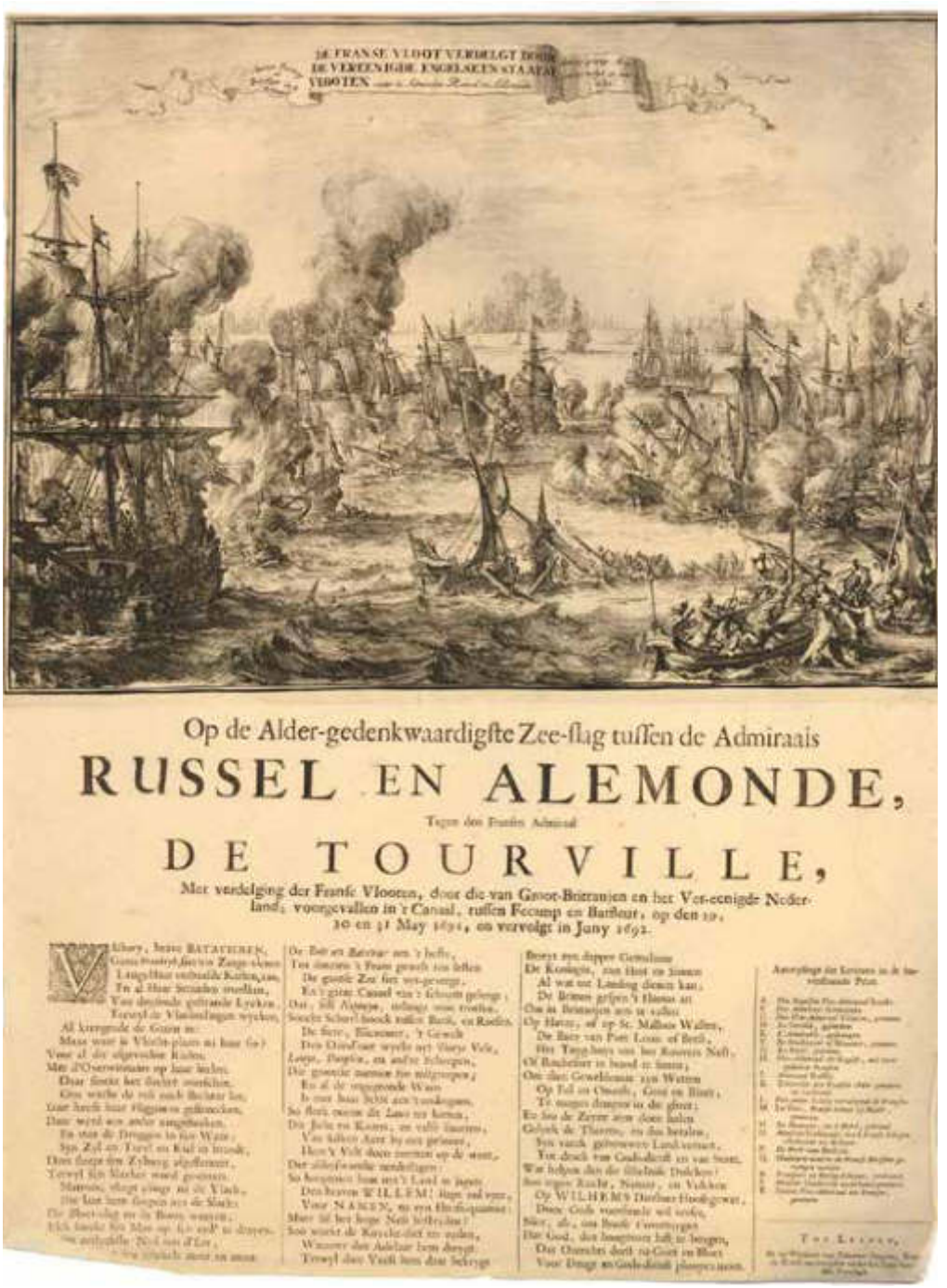
Texel, Battle of
21 August 1673

Beachy Head, Battle of
10 June 1690

Barfleur and La Hougue, Battle of
29 May-14 June 1692

[159] R. Winfield, *Op. cit.*, 2009.

[160] J.J. Colledge, B. Warlow, *Ships of the Royal Navy. A Complete Record of All Fighting Ships of the Royal Navy from the 15th Century to the Present*, London, Chatham Publishing, 2006, pp. 301 and 327.



Romeyn de Hooghe, *A broadside on the Sea Battle at La Hogue*, 1692, Published by Widow of Johannes Tangena, The British Museum, London.

during the Raid on the Medway.

The next English flagship at the Battle of Solebay was the 100-gun *Prince* (1670) under the command of the Duke of York, but the next year, at the two Battles of Schooneveld, under the admiral Prince Rupert of the Rhine (1619 – 1682), the fleet flagship was the *Royal Charles II* (1673), while the *Prince* was the Blue squadron's flagship. The last naval battle of the *Prince* was that of Texel, during which she was again the Blue squadron's flagship, and the *Royal Sovereign* was the Red's.

Brederode – This warship was built for the Admiralty of Rotterdam and launched in 1644. With 59 pieces of cannon on board, the *Brederode* was one the largest warships of the Dutch fleet. Intended for the naval officer Witte Corneliszoon de With (1599 – 1658), she was first used as flagship of Maarten Harpertszoon Tromp (1598 – 1653), during the First Anglo-Dutch War (1652-1653). She took part in the Battle of Dover, of Portland, and of the Gabbard.* During the latter, Tromp decided to detonated her for she was boarded by the English. After repairs, she participated in the Battle of Scheveningen* during which Tromp was killed. Following this event, she returned to De With.

Eendracht – Built in 1655, she became the flagship of Tromp's successor Lieutenant-Admiraal Jacob van Wassenaer Obdam. Already in 1656 she took part in the expedition to Danzig, and two years later, she fought successfully in the Northern Wars, defeating the Swedish fleet in the Battle of the Sound.* She also took part in the Battle of Lowestoft, in which she was destroyed after only 10 years of service.

Zeven Provinciën – This 80-guns warship launched in 1665, became the flagship of the admiral Michel Adriaenszoon de Ruyter during the Second Anglo-Dutch war. She fought at the Four Days Battle, and the next year she took part in the Raid on the Medway (1667). De Ruyter decided to keep her as flagship during the Third Anglo-Dutch War (1672-1673). She was present to all the main battles: the Battle of Solebay, the two battles of Schooneveld, and the Battle of Texel. Finally, in 1692 she participated in the Battles of Barfleur and the Hogue,* in which she was severely damaged. She was finally broken up in 1694 after almost 30 years of service.

Gouden Leeuw – Although not the flagship of the Dutch fleet, the *Gouden Leeuw,* built in 1666 and carrying 82 guns, became the flagship of an important admiral, Cornelis Tromp, under the command of De Ruyter. During the Third Anglo-Dutch War, she participated in the first and second Battles of Schooneveld, and the Battle of the Texel. She was broken up in 1686.

** Dates of naval battles mentioned in these pages in chronological order:*

Dover, Battle of
29 May 1652

Portland, Battle of
28 Feb.-2 Mar. 1653

Gabbard, Battle of
12-13 June 1653

Scheveningen, Battle of
10 August 1653

Sound, Battle of the
8 November 1658

Lowestoft, Battle of
13 June 1665

Four Days' Battle
4 June 1666

Solebay, Battle of
7 June 1672

Schooneveldt, first Battle of
7 June 1673

Schooneveldt, second Battle of
14 June 1673

Texel, Battle of
21 August 1673

Beachy Head, Battle of
10 June 1690

Barfleur and La Hougue, Battle of
29 May-14 June 1692

Richard Paton, *Battle of Barfleur*, 18th century, National Maritime Museum, London.

What immediately stands out is that French flagships, despite being the most powerful (100 guns) and the largest ships, were not exploited as naval weapons as much as foreign flagships. Indeed, both the *Royal Louis* and the *Soleil Royal* took part in only one action each, in their long lives of almost 30 and 20 years. A similar fate was shared by the *Sovereign of the Seas* before her rebuilding in 1651; indeed, for the first fifteen years, she did not participate in any action. Then, in her new life as *Royal Sovereign* and after another period in the shipyard, she counted several other actions. Differently, smaller Dutch flagships were present in all the main naval battles, having all participated in several actions. That can be justified by thinking that the huge and highly decorated vessels had a very high cost for their maintenance, and the crew needed to arm and operate them made management costs exorbitant. In addition, the massive volume of the topside due to the decorations negatively affected the aerodynamics of these vessels, thus making them not even easily manoeuvrable. Therefore, it appears that this exaggerated attention to decoration and visual impact was in some way the main thought in the creations of these ships. Overall, it could be said that aesthetics was so important as to monopolize the

scene, even at the expense of naval efficiency. Actually, this has already been clear for some time in the world of shipbuilding, as Sir Walter Raleigh, already in the second half of the 16th century, stated:

> «We find by experience that the greatest ships are least serviceable, go very deep to water, and of marvellous charge and fearful cumber. [...] besides they are less nimble, less mainable, and very seldom employed.»

During in the 1630s, during the construction of the *Sovereign of the Seas*, the Corporation of Trinity House of Deptford argued that such a vessel would have been unusable and also dangerous due to its size.

> «[...] a ship of these proportions cannot be of use, for these reasons: there is no port within the kingdom that can in safety harbour this ship, so that she must be in continual danger, exposed to all tempests.»[161]

However, even if not employed in naval combat, thinking that these sailing masterpieces could not be used for other purposes would be wrong. In 1672, Marie de Rabutin-Chantal marquise of Sévigné (1626 – 1696), well known for her private letters letter, wrote to her daughter Françoise-Marguerite de Sévigné, countess of Grignan (1646 – 1705):

> «Rien n'est plus romanesque que vos fêtes sur la mer, et vos festins dans le Royal-Louis, ce vaisseau d'une si grande réputation.»[162]

«Nothing is more romantic than your feasts on the sea, and your banquets in the *Royal Louis*, that vessel of such great reputation.»

It suggests that a part of the French aristocracy's social life was delighted also by exploiting these wonderful floating artworks, not used for naval combat. But this would just be a confirmation of the fact that in the 17th century, flagships were symbols of power and an ostentatious display of strength. Their value was linked to the symbolic nature of the power that a Navy assumed by having that type of ship in its fleet and the institutional role went beyond mere use in military actions. Their function was to represent the state of the sea.

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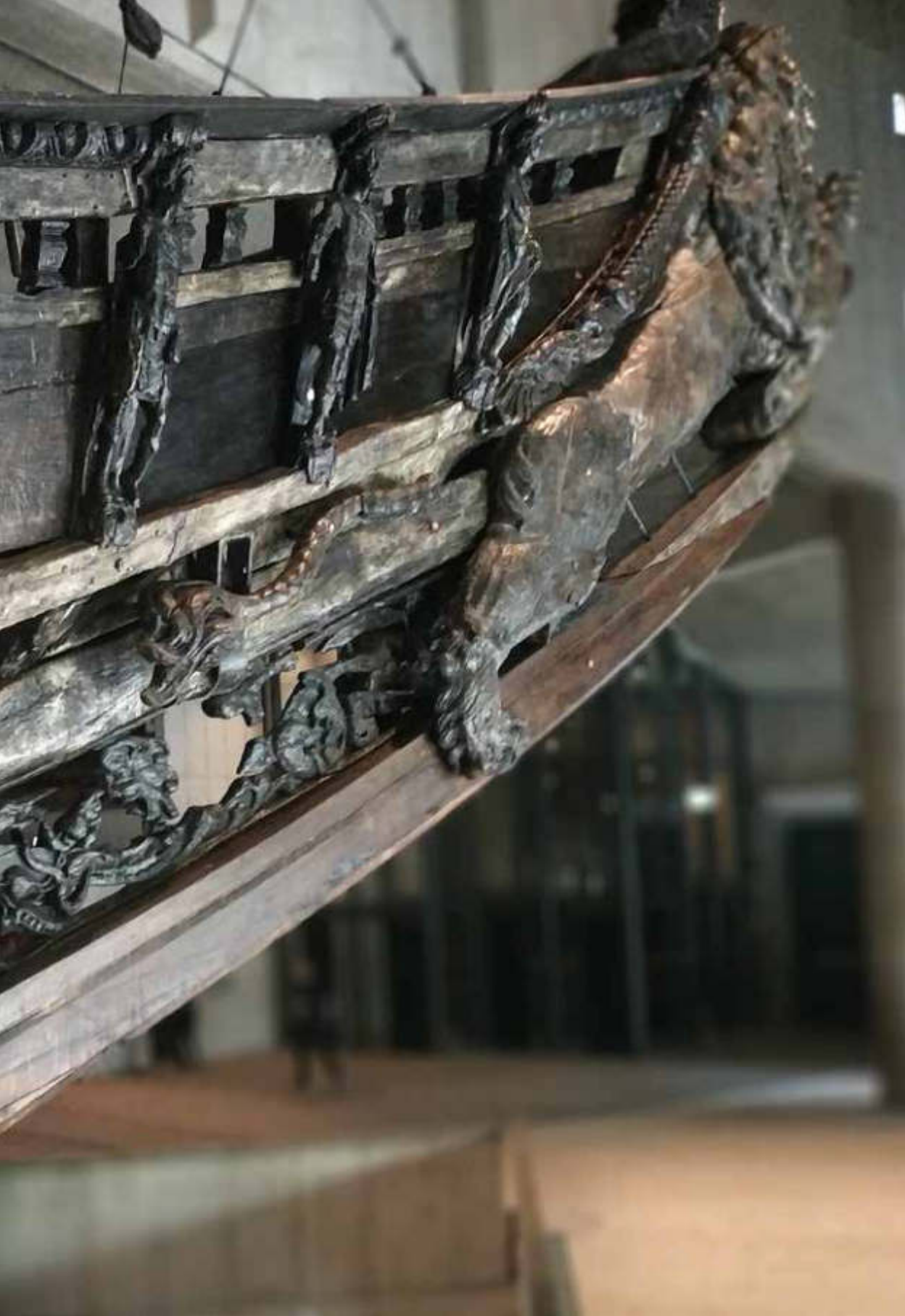
[161] J. Bruce, *Op. cit.*, p. 184.

[162] M. de Rabutin-Chantal, Sévigné (marquise de), *Lettres de Madame de Sévigné, de sa famille et de ses amis*, tome 3, Paris, Hachette et Cie, Imprimerie de Ch. Lahure et Cie, 1862, p. 78.



Part 2

The Warship *Vasa*, a unique case[1]

In the previous pages: bow and decorations of *Vasa*.

Textual descriptions, scaled models, and above all iconography, are the best evidence from the 17th century that remains in the present day. These sources allow us to study the past design and the decoration of ships. However, they are not totally objective. Indeed, it must be always kept in mind that they had been influenced by many factors, both unintentionally or on purpose. We should consider the context, the customer, and the audience the work was created for. For instance, a painting made to glorify a victory during a war could exaggerate the power of the winner, and together show the loser completely defeated and overwhelmed. One example could be the painting made by Philip James de Loutherbourg (1740 – 1812) in 1796, depicting a scene from the attempted Spanish invasion of England in 1588. On the 7th of August (28th of July O.S.), at midnight, the English attacked with fireships the Armada, which was anchored off Calais. To prevent their ships from burning, the Spanish fleet broke formation, becoming vulnerable, and on the dawn of the day after, the English engaged the enemy fleet, in the action known as the Battle of Gravelines (8 August 1588). Although no ships were burnt, the painting, made about two hundred years later, shows the morning after the night attack in a terrifying scene. Indeed, it shows the Spanish fleet while burning in a terrible fire which colours everything of a really dramatic red. On the opposite side of the canvas, the English fleet is attacking the enemy; in the foreground, the *Ark Royal* (1587), the English flagship under Lord Admiral Charles Howard, 1st Earl of Nottingham, 2nd Baron Howard of Effingham (1536 – 1624) is leading the fleet with a victorious aspect. The context in which the artist painted this work must be considered in order to understand the exaggeration of pathos. Loutherbourg was born in Strasbourg and moved with his family to Paris at the age of 15, where he could improve his artistic talent. In 1771, he moved to London, and thanks to his great ability he became the chief stage designer at the Drury Lane Theatre, one of the oldest theatres in London. In France, he specialised in romantic and picturesque landscapes, and during his career at the London theatre, he improved the technique and

[1] If not differently specified, the pictures of *Vasa* in this chapter have been taken by the author from March to May 2022.

Philip James de Loutherbourg, *Defeat of the Spanish Armada, 8 August 1588*, 1796, National Maritime Museum, Greenwich, Hospital Collection.

the special effects of stage backgrounds.[2] Then, on 1 February 1793, France declared war on England. King George III (1738 – 1820) commissioned Loutherbourg to paint the conflict, and so he became the first English artist (he was naturalized British) who accompanied the English forces in an official capacity. Through this commission, the *Grand Attack on Valenciennes* was created.[3] From that, the king commissioned him other paintings commemorating the English naval victories and glorifying the English fleet, and one of these is the mentioned *Defeat of the Spanish Armada* or D*estruction of the Armada*. Considering all these elements, it is possible to understand why Loutherbourg's painting of the defeat of the Armada is not showing the real event but an exaggeration of it. It is the result of the style of the artist and the aim of the commission. Indeed, his romantic spirit made him interested in human feeling, pathos and virtue, all aspects that he put in his works,[4] and the commitment was asking for a painting showing the power of the English navy. This example makes clear that it is not possible to rely only on the iconographic sources studying the past. This weak point of iconography as a historical source generates some questions about the consideration of ship decorations based on iconography and other historical reports of that time. Were those ships as much decorated as they appear in paintings? Or was this the result of an exaggeration by the artists, maybe due to a precise request of the client?

Questioning the past, historical evidence and discoveries are generally reliable elements since they *are* pieces from the past. Iconography has

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[2] C.J. Murray (Ed.), *Encyclopedia of the Romantic Era. 1760-1850*, Volume 2, L-Z Index, New York & London, Fitzroy Dearborn, 2004, pp. 695-696.

[3] L.E. Preston, *Philippe Jacques de Loutherbourg: Eighteenth Century Romantic Artist and Scene Designer*, Doctoral Philosophy Thesis of the University of Florida, 1957, p. 89.

[4] L.E. Preston, *Op. cit*.

intrinsically a communicative intent which shows only an idea of the reality. Furthermore, it is not even sure that it represents completely the truth, as the aforementioned example shows. Also analysing a "piece of the past" without really understanding it, is possible to incur errors. For this reason, it is important to be sure of the real destination of the objects studied, their contest, and the culture they come from. Unfortunately, few elements of 17th-century ship design have survived until today, moreover, most of them have lost their integrity, and thus could not tell the whole story of their lives. The part of the hull of the *Mary Rose* is an example of that. She was an English carrack of the 16th century of which a section survived, and it is now preserved in Portsmouth at the Mary Rose Museum. The *Mary Rose*'s wreck and all the recovered artefacts that have been found on the site are very important to learn something more about the Tudor period and its shipbuilding but they do not help to understand the decoration of the ship.

There are also finds that are parts of ships and can tell something more about their decoration. An example is the stern decoration of the English *Royal Charles* held by the Rijksmuseum in Amsterdam. In June 1667, the ship was captured by the Dutch after the Raid on the Medway, and her stern decoration was taken as a trophy and fortunately preserved until today. She was an 80-gun first-rate three-decker warship. Originally, she was called *Naseby* but in 1660, during the Restoration, she was chosen to bring Charles II back to England, at which point she was given her new name. The part of the decoration that survived represents the tafferel, where the national coat of arms was usually depicted. This find can tell us much about the realization of this element in English shipbuilding of the 17th century, and interestingly, comparing it to *Vasa*'s stern decoration, it is possible to see not only a similarity in the iconography, but also a significant difference in the construction methodology, as will be discussed below. Other important and more numerous finds are figureheads. For example, the National Maritime Museum (Greenwich, London) has one of the largest Merchant Navy ship figurehead collections, the Naval Museum in La Spezia (Italy) holds 29 figureheads, and the Karlskrona Marinmuseum has a great figureheads collection as well. Figureheads can help to understand the way sculptures were made and the artistic style used on ships at the time they come from. However, they give only a fragment of information about the whole image of a ship and her decoration.

Scale models can be another source of information, being a representation of the whole ship. However, also studying models some problems can incur, making them not completely reliable. For instance, the Sjöhistoriska Museet of Stockholm holds the model of a two-deck 50-gun ship, in scale 1:20, built at the end of the 17th century. The model was restored by Jacob Hägg for an exhibition in 1897, and during this operation part of the carved decoration was replaced. Not having any description

Model of the *William Rex*, Adriaen de Vriend, Adriaen Davidsen, Cornelis Moerman, 1698, Rijksmuseum, Amsterdam.

and reports of the original condition, it is not possible to know how much the decoration has been modified, and if the scheme and colours are still original. Some models have arrived to us without undertaking changes during their restoration. The Rijksmuseum holds a 1698 well-preserved scale model of a 74-gun Dutch warship called *William Rex*, which was built at the dockyards of Vlissingen (Flushing) in the late 17th century. The model should be twelve times smaller than the original ship and was originally displayed at the council chamber of the Admiralty of Zeeland, in Middelburg. Nevertheless, models are not a perfect representation of the real ships, since they have a certain degree of approximation. They could also represent imaginary ships, for example, artistic objects made for private collections or expositions, instead of being used as real models for shipbuilding. Moreover, the accuracy is limited to the scale dimension, and if they can tell more about the artistic style of decoration, they do not give any piece of information regarding the construction method.

And then there is *Vasa*. Sculptures and context, story and reality. *Vasa* represents "the largest waterlogged wooden find ever to be retrieved from the seabed"[5] and it makes her a unique find able to show decorations enriching a warship in the context of the entire body of the ship. She is an extraordinary opportunity that history has given us. A chance to study an original Swedish royal warship of the 17th century in her integrity, with almost all her decorations intact. *Vasa* was launched in 1628 in Stockholm,

[5] E. Hocker, *Preserving Vasa*, London, Archetype Publication Ltd, 2018, p. 161.

and she should have been the biggest and most decorated ship of the Swedish fleet. But her destiny wrote a different story for her. Soon after the launch, she started to heel too much and soon water started getting inside the open gunports. In a few minutes, *Vasa* was just a wreck under the sea. After that, a long period of darkness followed and only over three hundred years later, in the 1950s, Anders Franzén and Per Edvin Fälting, two civilian employees of the Swedish navy, relocated the wreck giving the start to the great operation to save her. The ship is now preserved at the Vasa Museum in Stockholm where she started her new life, no more as a warship, as she was intended to be, but as unique historical evidence, a role that, for our purposes, is even more important. By studying *Vasa* and her decorations, it is possible to compare a real warship to the coeval iconography. This comparative approach has two main advantages. On one hand, *Vasa* allows a careful study of all her components and an opportunity to clearly understand all those details at which artists often only hinted. On the other hand, through Vasa, it is possible to look directly at the decoration aboard a 17th-century warship without any "filter" of the artist's eyes and thus deleting all those influences, simplifications, and changes which make paintings not completely objective representations of reality. For example, the presence of all her decorations allowed the researchers of the Vasa Museum to understand the global message that her sculptures should have spread during her life. The messages that might be clear for an educated person of the 17th century could be enigmatic to someone from the present day. In the same way, an in-depth study made by Peter Tångeberg has brought *Vasa* to shine again in her original bright colours by comparing the traces of the chromatic traces left in the wood to the iconography of that period. The coloured copies, a scale model of the ship and a 1:1 scale reproduction of some sculptures, show the original visual impact that *Vasa* and the other ships of that time had, which is an effect even more impressive than what is shown in naval paintings.

Regarding the present research, *Vasa* can allow an understanding of the techniques used, how decorations were made, and how they were joined together and fastened to the hull. Indeed, she is not only important as evidence of the decoration aesthetics but also of the complex work behind the creation of these sailing art stages. This is an important part of 17th-century ship design about which neither iconography nor models can teach us. *Vasa* offers the chance to go under the surface, analysing and dissecting her sculptures almost in an anatomic way. There is still much that can be learned by looking closer at each sculpture, and in detail, at each head, arm, or leg of the creatures that are sharing with *Vasa* their story and destiny. The following chapter has been made after a period of three months at the Vasa Museum and it reports some of the aspects studied and some considerations about the design of her decoration.

The first paragraph is dedicated to a short introduction to the story of this ship, from her construction to her recovery. In the second part, attention is focused on the design of sculptures. The main aspects will regard the general arrangement of decoration and the function of the decorative elements, as well as the design process to the extent that it can be understood from studying the structure and the relationship between sculptures and hull. The last part of this section is dedicated to comparing *Vasa* and the decoration that can be appreciated from contemporary iconography. This has in definitive allowed a comparison between the world of iconography, which is influenced by various factors – such as the artist's point of view and the client's requests – and the reality of design and decoration of these sailing masterpieces from the 17th century.

1. The story of Vasa

The design process applied to Vasa

Before starting the analysis of *Vasa*'s sculptures, it is important to know the story of this warship. Indeed, to be aware of the context in which she was built is essential to understand the choices that had been made and appreciate her value as an unique historical evidence. The story of this warship will be analysed following the main steps of the design process. Although it is not properly correct to talk about the "design process" in the modern meaning of studying a ship of the 17th century, this choice has been made because it is still interesting to see how, also in the past, the main steps leading the shipbuilding process were not so different from today. Indeed, the start was always a commission from the customer to the builder, that is what we call the "client request". The client did not only asked for a generic ships, but made specific requests, generally about dimension and number of guns, giving to the shipwright a precise task. In this specific case, the client's request is what the Swedish king Gustav II Adolf asked to Henrik and Arendt Hybertsson. They were two Dutch brothers moved to Sweden at the beginning of the 17th century with a typical family business: Henrik was a master shipwright while Arendt was a merchant with the task of purchasing material.[6]

The second step in the design process is usually the study of the competitors, that is, other products similar to what the designer has to

[6] F. Hocker, *Vasa. A Swedish Warship*, Mölnlycke, Medströms Bokförlag, 2011, p. 36.

create. Actually, *Vasa* did not have many competitors at that time, but there were some ships in Europe that were similar in dimension and guns power to what *Vasa* was expected to be, and it was the Dutch shipbuilding the real background of *Vasa*'s construction as Henrik Hybertsson built her following the Dutch tradition.

The last step is the design and the realization of the product. As generally happened to the ships of her time, *Vasa* was not *designed* in the modern sense. Her hull shapes were not a result of calculations and mathematical functions, and actually, they were not even drawn on paper. Shipwrights had in mind what to do and how to do it, basing their work on their experience and proportional rules. Indeed, even if in the second half of the 16th century the English Royal master shipwright Matthew Baker had introduced the drawing in shipbuilding before it became a common attitude many years had still to come. Moreover, Baker's process was still linked to rules of proportion and it would not be until a century later that ships started to be designed when Sir Anthony Deane developed a mathematical system to calculate the draught of water required to float a ship knowing the weight of the material used to build her and her volume.[7] Through these steps, it is possible to understand the story of *Vasa* and the context in which she was built.

"Client's request" – At the beginning of the 17th century, victory in naval battles still depended on the crew's ability and hand-to-hand combat. That is also shown in paintings depicting naval battles of the time, such as the *Battle of Gibraltar in 1607* by Cornelis Claesz van Wieringen (c.1576 – 1633). The situation remained almost the same during the century in the Mediterranean Sea, where galleys were still used to fight, as shown by the *Zeeslag tussen Turkse oorlogsschepen en galleien van de Ridders van Malta, 1644* attributed to the Dutch engraver and draughtsman Caspar Luyken (1672 – 1708). In this artwork, we can see in detail a galley boarding a ship, and men climbing on it to fight against the enemy. But things were changing in the Atlantic waters. Guns on board started to show their power and the most forward-looking minds would notice it. The English navy was one of the first to understand the indubitable force of guns and already in 1618, the Commission of Reform declared how future naval battles should be fought. Nevertheless, although the Commission was pushing for ships larger than 800 tons,[8] not all the English shipwrights agreed. In 1608, when Phineas Pett (1570 – 1647) was building the *Prince Royal*, his colleagues reported him to the Commission

[7] G.P.B. Naish, "Ship and Shipbuilding", in C. Singer, E.J. Holmyard, A.R. Hall, T.I. Williams (Eds.), *A History of Technology*, *From The Renaissance to the Industrial Revolution c. 1500 – c. 1750,* Vol. 3, Oxford, Clarendon Press, 1957, pp. 471-500 (reference to p. 488).

[8] F.L. Robertson, *The evolution of naval armament,* London, Constable & Company LTD, 1921, p. 21.

Cornelis Claesz van Wieringen, *Battle of Gibraltar in 1607*, c. 1621, Rijksmuseum, Amsterdam.

Caspar Luyken, *Zeeslag tussen Tur kse oorlogsschepen en galleien van de Ridders van Malta, 1644*, 1701, Rijksmuseum, Amsterdam.

of Enquiry into the abuses of the navy for the bad design and building of his new ship under construction. A new era in English shipbuilding had started.[9] England was not the only state that noticed the new route that ship design was taking. Sweden's king Gustav II Adolf understood the relevance of guns in naval warfare and wanted to use these new weapons to support his desire for dominance in the Baltic region. Indeed, at the beginning of the century, Gustav Adolf was committed to maintaining and affirming his kingdom. On one hand, there were three wars to fight at the same time against Denmark (peace in 1613), Russia (peace in 1617) and Poland (peace in 1629). On the other hand, there was the need to affirm his legitimacy to the throne, shaken by the ambitions of Sigismund III Vasa (1566 – 1632), an elder cousin of Gustav. In 1599, Sigismund was deposed from the kingdom of Sweden but refused to renounce the throne until 1626, with the advance of the Swedish troops in Poland. Thus, in contrast with Swedish tradition, the king committed ships larger than the average. In the 1620s, Sweden launched larger ships, such as the *Gustavus* (1624) and the *Tre Kronor* (1625) and in 1625, the king commissioned two even larger ships, the *Vasa*, and the *Applet III* probably launched in 1628.[10] The first to be built was *Vasa*. The name derived from the royal family's heraldic emblem and her construction began in the spring of 1626 at Blasieholmen.[11] She was meant to be the flagship of one of the Swedish squadrons* and precisely, the one stationed at Älvsnabben, outside the Swedish archipelago, ready to reject an eventual Danish attack.

**Squadrons*

Since 1620, Gustav Adolf attempted to organize the navy dividing it it five fleets. Nevertheless, the subdivision changed soon and from the 1630s, warships were permantently divided in three squadrons. See: J. Glete, *Swedish Naval Administration, 1521-1721*, Leiden and Boston, Brill, 2010, pp. 632-633.

"Competitors" – All the large warships built in those days can be identified as "competitors" of *Vasa*. Regarding Swedish warships, at the time of her launch, there were actually no warships of her size. The fleet was generally composed of smaller ships like galleys and pinnaces, and common warships were usually one-deckers. And in 1628, larger warships had been lost – almost all the previous large ships, such as the *Mars* and the *Neptunus* (1566), had been broken up, lost in action or discarded – or still had to be built. The only exception was probably the *Kronan* built at Harbovik in 1618.[12] This ship had a crew of 127 men (of which: 2 officers, 7 priests and scribes, 8 non-commissioned officers, 88 sailors and 22 soldiers) and was equipped with 32 cannons.[13] *Vasa,* which should have been armed with 64 guns and had a crew of 145 sailors and 300 soldiers, was clearly larger and more powerful. The reason for having small-sized ships was that, until that moment, there was no need for larger ships. The only naval action undertaken under Gustav Adolf was the Battle of Oliwa in 1627, in which the Polish fleet won. Mostly, ships were used in warfare

[12] Cf. J. Glete, *Op. cit.*, pp. 683-684.

[13] P.O. Bäckström, *Svenska flottans historia*, Stockholm, P.A. Norstedt & Söners Förlag, 1884, p. 388.

as support of land attacks, such as for carrying troops or preventing enemy ports to receive goods and help from the sea.[14] To find other two-deckers of that time, it is necessary to look at foreign shipbuilding, in particular at the aforementioned *Prince Royal* and *Grand Saint Louis*. Most likely both Gustav Adolf and the shipbuilders had these ships in mind, which were probably a stimulus for the king's requests.

Grand Saint Louis (1626)*

- Length = 34.8 m
- Beam = 12 m
- Depth = (?)
- Armament = 52 guns
- Crew =310

* The two warships here depicted are both French ships built in the Dutch Republic like the *Saint Louis*.

Henricus Hondius, *Navire Royale / faiete en Hollande / Anno 1626*, 1626, Maritiem Museum Rotterdam.

Detail: Jacob Gerritz Loef, *A Warship, built in 1626 by order of Louis XIII in a Dutch shipyard, Arriving at a Dutch Port under Guidance of a Dutch Ship*, 1626 - 1635, Rijksmuseum, Amsterdam.

[14] F. HOCKER, *Op. cit.*, p.30.

Prince Royal (1610)

- Length = 35 m
- Beam = 13 m
- Depth = 5,5 m
- Armament = 55 guns
- Crew = 500

Detail: Hendrick Cornelisz Vroom, *The arrival of Frederik V of the Palantine and Elizabeth Stuart in Flushing on 29 April 1613*, 1623, Frans Hals Museum, Haarlem.

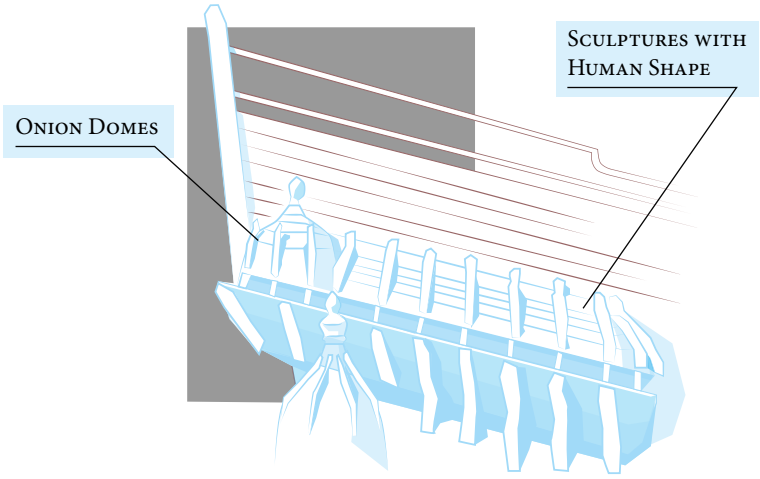
Vasa (1628)

- Length = 41 m
- Length overall = 69 m (including the bowsprit)
- Beam = 11,5 m
- Depth = 4,8 m
- Height at the stern = 19 m
- Armament = 64 guns
- Crew =154 sailor, 300 soldiers

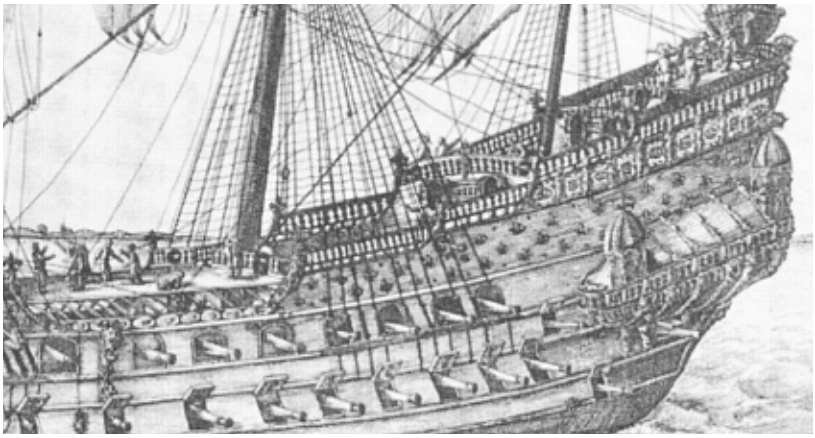
Warship *Vasa*.

The three ships are similar in dimensions and proportion, though *Vasa* was larger than the others and carried more guns. The *Prince Royal* was built at Deptford by Phineas Pett, patronized by Henry Frederick, Prince of Wales (1594 – 1612) and was one of the first English ships carrying two decks of guns. The *Grand Saint Louis* was one of the warships built in Amsterdam for the French navy, and these kinds of ships are likely to be the models for the construction of *Vasa*. Indeed, according to Hybertsson, *Vasa* was designed following the example of a large warship recently built in the Netherlands for Charles de Lorraine, Duke of Guise (1571 – 1640), who was admiral of the French Mediterranean fleet. Moreover, Arendt de Groot stated that he showed a picture of this vessel to Gustav Adolf and used as a model.[15]

The similarity between *Vasa* and French warships built by the Dutch can be seen by comparing the decoration depicted in iconography with the real ship. Indeed, focusing on some details, it is clear that the Swedish warship is more akin to a Dutch ship than an English one, especially concerning the quarterdecks and the galleries. A painting of a French ship build in Amsterdam in 1626 is also showing the same similarity, especially in decoration. The orthogonal lines of the English ship are different from the curvilinear shape of the other ships' galleries. The ceilings of galleries also show a clear connection between French and Swedish ships; indeed, they all have "onion domes" and the roofs are ornate with long sculptures with with a human form. Some details are common also to the English ships, such as round gunports enriched with wreaths on the upper deck and human-shaped sculptures at the connection of different level decks. On the contrary, the presence of three-dimensional sculptures on gunport lids is something quite uncommon and it is curiously present n the painting of the French ship.

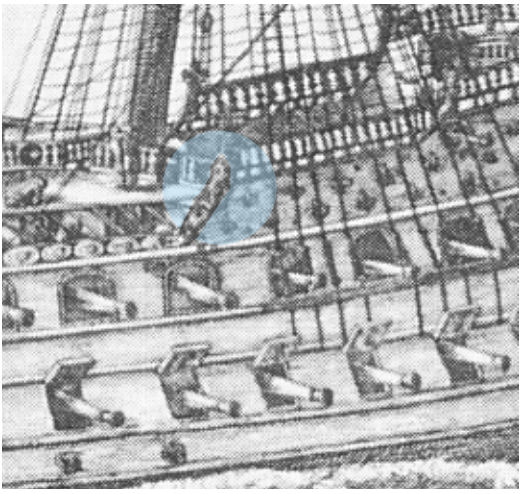


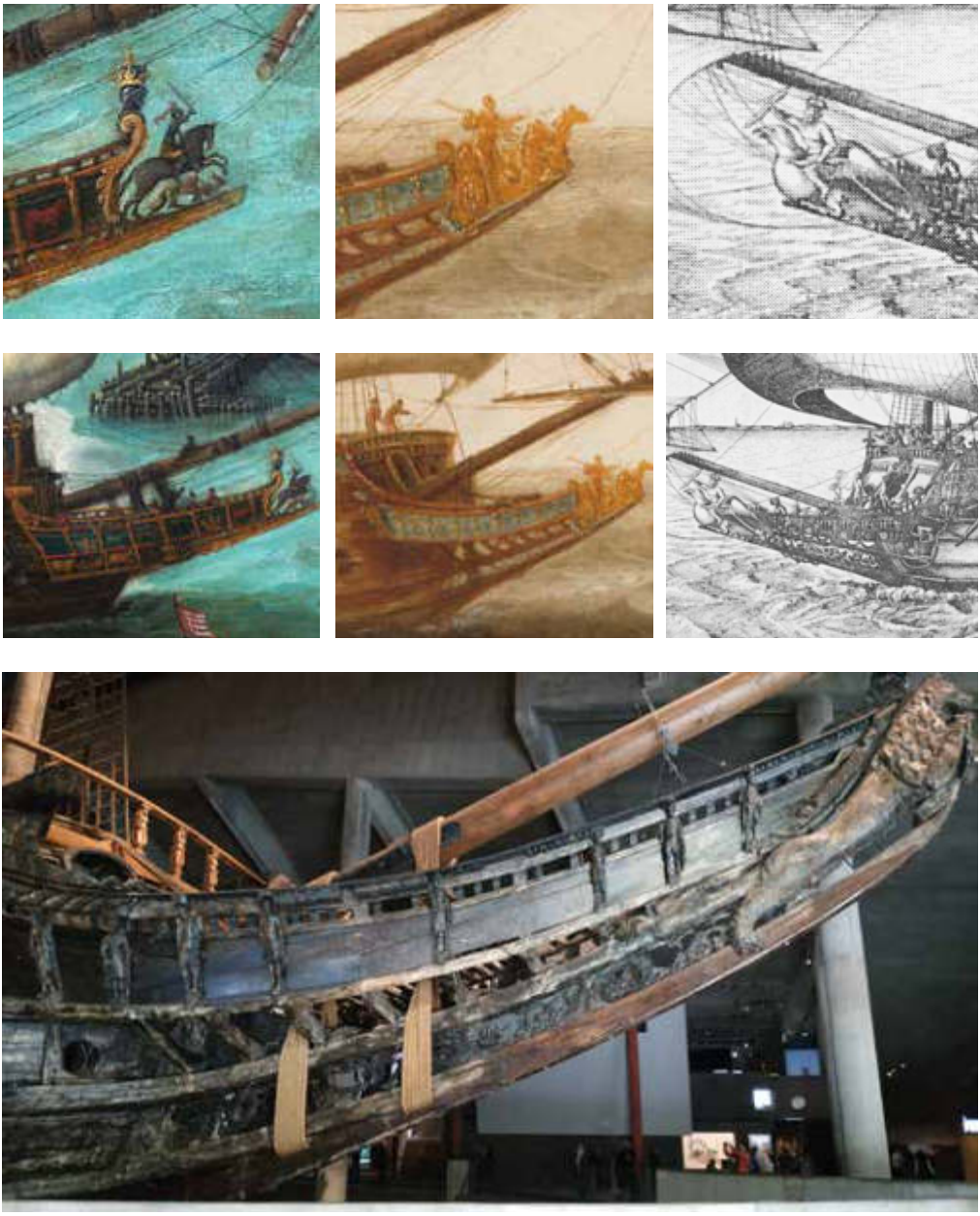
[15] K.J. Rose, "The Naval Architecture of Vasa, a 17th-Century Swedish Warship", Texas A&M University PhD Thesis, 2014, p. 317.



Comparison between the quarterdecks of English, French and Swedish ships.

Comparison between decorative elements in the sides of English, French and Swedish ships.





Comparison between the beakheads of English, French and Swedish ships. Picuter of *Vasa* by the author.

The figurehead of *Vasa* seems to be somewhat smaller than the ones depicted in the other three ships since they all represent human statues riding something. The *Prince Royal* had the figure of Saint George on horseback, while the two French ships had one Neptune on the chariot and the other Jupiter riding an eagle. Except for this, the structure of beakheads is quite the same having vertical figures on the upper part and a frieze in the lower section.

Design of Vasa – Although *Vasa* was not really "design" in the modern sense, the shipwright, Henrik Hybertsson, had to find a way to address the king's requests, which were to have a powerful two-deck able to send a message of strength thanks to his guns and decorations. As already mentioned, the construction followed the Dutch tradition, and this is not surprising considering that both Hybertsson and half of the men working at the Stockholm arsenal came from the Dutch Republic.[16] Oak was the wood used for the construction, since it was the common essence of shipbuilding in Northern Europe. Nevertheless, large ships needed a strong structure and the introduction of two gun decks was an innovation that required particular attention. Indeed, the ideal weight distribution for ships was (and still is) to have thier heaviest elements as low as possible, and having guns in an upper position meant exactly the opposite. That generated a great amount of stress for the structure, in addition to raising the centre of gravity. When Pett had to build the *Prince Royal*, he decided to strengthen her hull by using some innovation in the construction method. Indeed, she was double planked and all the butt joints were double-bolted with iron bolts, both.[17] Hybertsson used a similar method, since he made a structure of three layers fastened by wooden pegs having a diameter of about 35 mm, and timbers where fastened to the side by iron bolts. Moreover, Hybertsson he build both sides and bottom by adding extra frames.[18]

The choice to use treenails instead of iron bolts for the planking was probably a consequence of the Dutch tradition. Indeed, one of the main differences between French, English and Dutch shipbuilding was the use of iron rather than wood to fasten ships. A summary is perfectly explained by Colbert in a letter dated 19 February 1671, sent to Colbert de Terron, Intendant a Rochefort:

> «Par tous les rapports que j'ay eus sur la marine de ces deux Estats, je vois [...] que les Hollandois mettent presque toutes chevilles de bois, les Anglois beaucoup et quelques-unes de fer, et nous presque toutes de fer.»[19]

«From all the reports that I have had on the navy of these two States, I see [...] that the Dutch put almost all wooden pegs, the English many and some of iron, and we almost all of iron.»

That means that the Dutch went on preferring wood to iron for external joints for all the century. Thee use of treenails instead of iron bolts had several advantages, and once understand it, the French minister promoted their use:

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[16] E. HOCKER, *Op. cit.*, p. 1.

[17] F.L. ROBERTSON, *Op. cit.,* pp. 19-20.

[18] E. HOCKER, *Op. cit.*, p. 1.

[19] P. CLÉMENT, *Lettres instructions et mémoires de Colbert*, Vol. 3, 1° part, Marine et Galères, Paris, Imprimerie Impériale, 1864, pp. 336-337.

> «[...]il faudra commencer à bastir un peu plus légèrement, et particulièrement en employant des chevilles de bois, d'autant que je vois que les deux nations [England and Holland] conviennent que les chevilles de fer, par la rouille, font des voyes d'eau, au lieu que le bois serre davantage le bois.»[20]

«[...] it will be necessary to start building a little more lightly, and particularly by using wooden pegs, especially as I see that the two nations [England and Holland] agree that the iron pegs, by rust, make waterways, instead of the wood pressing closer to the wood.»

And thanks to the use of wooden pegs, *Vasa* remained almost all intact, as most wood joints were still in place at the moment of her recovery, while almost all the iron parts were gone. Probably, if *Vasa* had been made with the French technique, they probably would have found it in many pieces.

The king's request regarded not only the structure of the hull but also the decoration. As already seen, ornaments and sculptures were used during the century to send messages, and Gustav Adolf had a clear idea of what he wanted to say: he was the only legitimate king on the throne, and Sweden had to become an empire.[21] These were the main messages, and even though subjects inspired by them are spread throughout the ship, it is possible to identify where they were concentrated. The bow was mainly dedicated to the "empire" message, as twenty Roman emperors were filling the space in the beakhead (one emperor has been lost). The figurehead is a lion holding the Vasa family coat of arms, and it is believed to represent Augustus (the only emperor not present in the beakhead) as well as the king, as Augustus is an anagram* of Gustavus. Moreover, the coat of arms represents a *vasa* (Swedish word for "bundle") thus, the whole decoration put Sweden in the succession of the Roman emperors and as the successive empire.

*Anagram

Roman characters :
AVGVSTVS
GVSTAVVS

Lion Holding the Royal Coat of Arms

Roman Emperors

[20] Letter from Colbert to Colbert de Terron (5 March 1671), in: P. Clément *Op. cit.*, p. 347.

The tafferel is more concentrated on the legitimation of the king and the identity of the ship. In the upper part, there is the face of a young Gustav Adolf being crowned by griffins, the fathers' symbols,[22] to claim his right to be on the throne by lineage. Below, sever sculptures of women and men ideally supporting the king as in a hierarchical pyramid probably meaning that he could not reign without their approval and loyalty. The section below shows two lions holding Sweden coat of arms and a third section displays the Vasa family coat of arms held by two angles, while armoured knights are at their sides protecting them.

The result was the construction of both one of the first two-deck ships and one of the largest ships built at the beginning of the century, which sank on her maiden voyage.

Techniques of preservation[23]

Vasa sank shortly after casting off, in the centre of Stockholm, near the island of Beckholmen. Year after year mud started to cover her hull, hiding her from the world which was continuing above the surface, over 36 meters of cold water. Thanks to these apparently unfortunate circumstances, *Vasa* remained protected from physical breakdown, excessive erosion, and biological attack.[24] Only after many years of silence, *Vasa* was ready to emerge and to start her new life. In the1950s, Anders Franzén began searching for *Vasa*'s wreck, and in 1956, he managed to find it. In the following year, the operation for her recovery started and in 1961, *Vasa* was finally lifted up.[25] Once *Vasa* was out of the water, it was necessary to start some operations in order to prevent the damages from which mud and cold water had protected her for a long time.

Today, *Vasa* is preserved at the Vasa Museum in Stockholm, and even though she can appear as an inanimate ship, an observation of her "daily life" shows her in a different light. Indeed, she is enlivened by the many tourists that go to visit her every year, and even more, by the experts who constantly work on her conservation. The critical points of her preservation are:

– Decomposition of wood
– Environmental phenomena (light, temperature, moisture)
– Structural failure (included fragile parts as junctions and supports)

As *Vasa* and all her parts were brought out of the water, the wood started to dried; that meant mechanical problems, such as shrinkage and distortions. It was urgent to find a way to freeze *Vasa* in her condition, and the conservators decided to spray the wood with layers of polyethylene glycol (PEG). This operation took seventeen years, and in the end, the wood of the ship acquired a dark, shiny, waxy surface. Nowadays, all the operations made on *Vasa* aim to preserve the integrity and stability of the ship.

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[23] A depth study on the techniques, problems, and solutions used to preserve *Vasa* from the beginning to recent times has been published by Dr. Emma Hocker [E. Hocker, *Preserving Vasa*, London, Archetype Publication Ltd, 2018].

[24] E. Hocker, *Op. cit.*, p. 7.

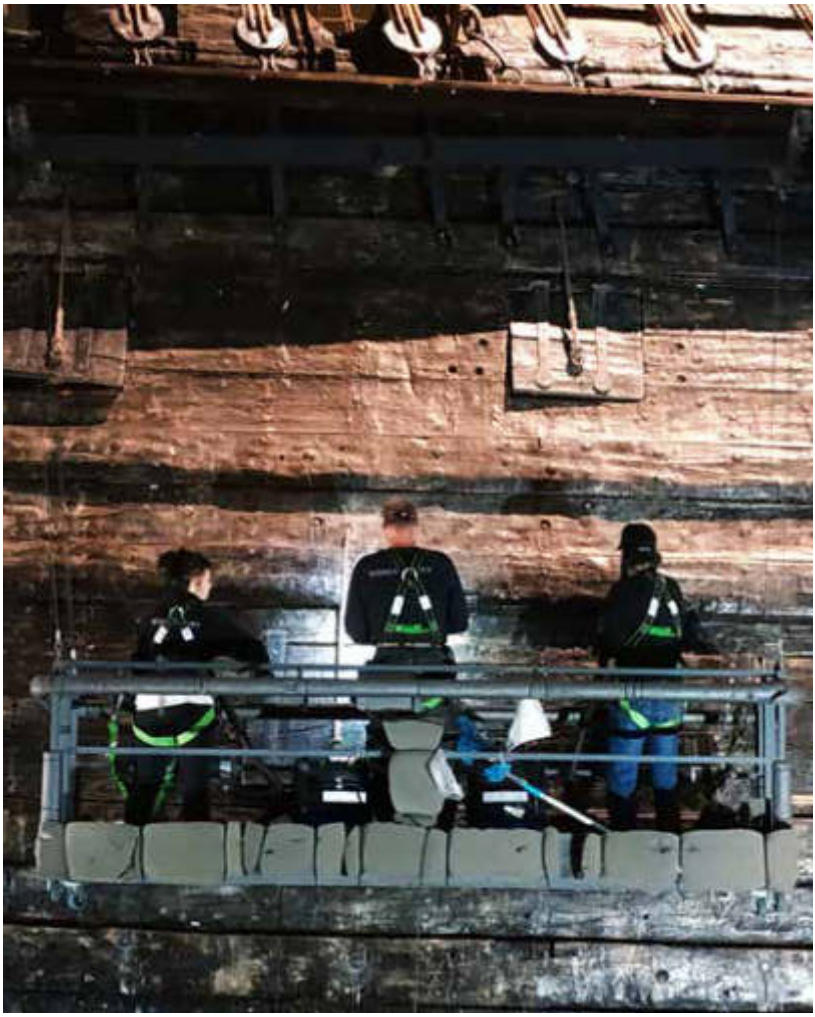
[25] Cf. C.O. Cederlund, et al., *Vasa I- The Archaeology of a Swedish Warship of 1628*, edited by Fred Hocker, Stockholm, National Maritimr Museum of Sweden, 2006.

Twice-a-year Cleaning (usually May & November) – Being completely covered by PEG, *Vasa* has a sticky surface that attracts dust. Combining it with the hundreds of visitors that the museum hosts every year, the result is that the ship quickly gets covered by particles mainly made of textile fibres and human skin. For this reason, it becomes necessary to clean *Vasa* twice a year with brushes, vacuum cleaners, and compressed air.[26]

Cleaning is done on every part of the ship. For the exterior of the stern, a fixed lifting platform is used, while for the sides, the operators use a basket hung on a crane, similar to skyscraper equipment, equipped with soft rubber wheels and foam rubber fenders that prevent the basket from hitting and damaging the hull. They use it to move up and down and from bow to stern, cleaning every inch of the ship. This operation is done in the evening when the museum is closed to visitors.

Cleaning operations on the deck of *Vasa* in May 2022.

Three operators standing in the basket cleaning one side of *Vasa*, May 2022.



Control of the atmosphere – To prevent the wood from deteriorating, the atmosphere has to be in precise and constant conditions. In particular, the temperature must always be between 17° and 20° C degrees, and the humidity at an average of 51-59%.[27] Forty measurement devices are placed over the ship (mostly on the outside of the hull and some inside) to keep control of the temperature and the humidity of the air around the ship. To maintain the perfect air conditions, several cylindrical machines that emit air are on the floor, close to the lower part of the hull.

Moreover, light can damage wood and PEG because it is a form of energy. Since daylight is particularly dangerous, the museum has been designed with few windows, all placed on the north side of the building and screening ultraviolet wavelengths. Artificial light can cause damage too, and thus, it has been necessary to study a low-energy light system, which could address the needs of the ship without preventing visitors from enjoying their tours and workers from doing their job. The 2007 lighting system used halogen sources, but today LED technology has replaced it since it is more energy-efficient, flexible, and allows the complete removal of UV.[28]

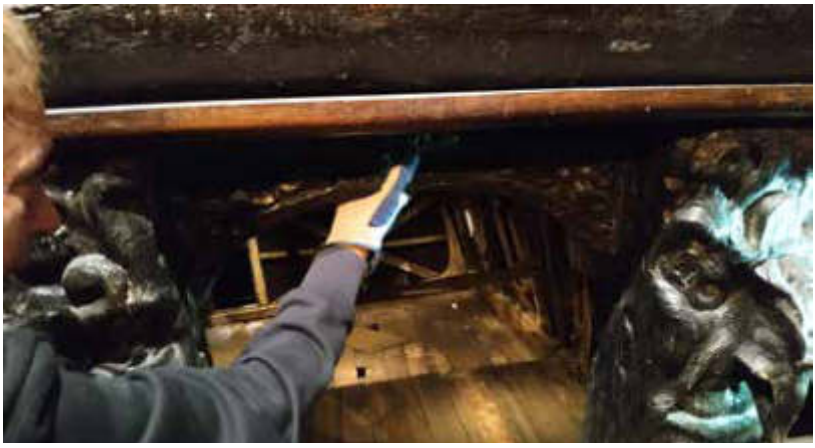
Measurement devices placed inside and outside the hull.

[27] E. HOCKER, *Op. cit.*, p. 123.

[28] E. HOCKER, *Op. cit.*, pp. 100-101.

Manual inspection of the sculptures – Among the operations carried out in order to monitor the status of *Vasa*, the staff does an annual manual survey of all decorations still on the hull to see if all the pieces are in good condition and well-fixed to the ship. If a part should be unsafe, first they try to understand whether they could secure it at the structure, and if there is not a valid solution, they have to remove it from the hull and put it in the magazine.

Control of the hull shape – Despite all the care taken to protect *Vasa* from the degradation of time, there are also some structural problems which threaten her preservation. The weight of the hull itself, superstructures, and sculptures is stressing and compressing the whole structure, causing slow but constant movements and distortions. To keep this alteration under control, two times a year, a 3D laser scanner measurement of the whole hull is made thanks to a "total station" (TS).



The carpenter Monika Ask doing a manual checking of the sculptures in the stern of *Vasa*.

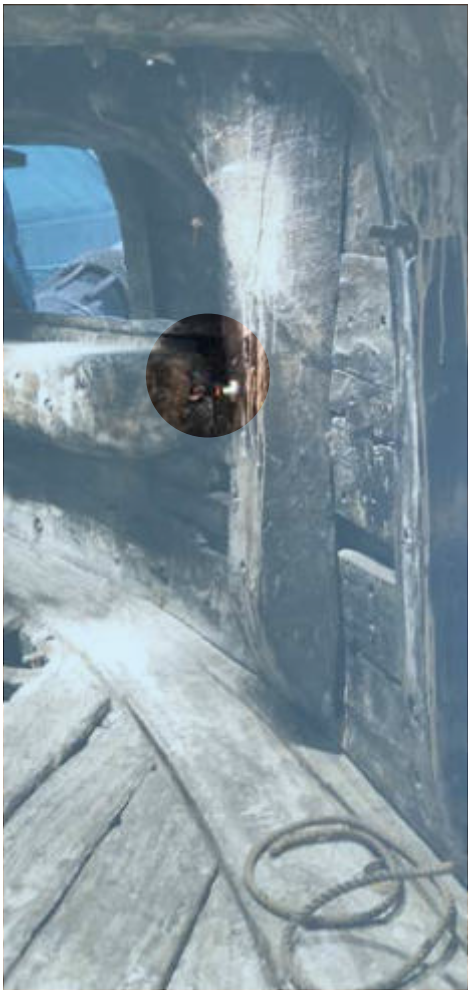
On the left: the Conservation Technician Ove Olsen placing the Total Station (TS).

On the right: holes in the ground used to mark the TS positions.

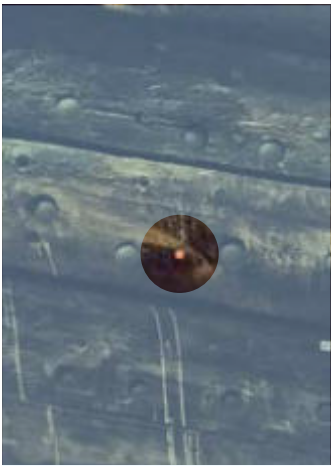
This operation has to be made with maximum precision and it usually takes two weeks. To see how much the ship is moving, every new scan is compared with the previous one and to make it possible, measurements always have to be taken at the same reference points. For this reason, fixed markers are present both on the ship and in the area around, helping the operators to place the total station always in the same spots, and from there, measure the same points. There are two kinds of markers; the ones used to place the machine in the right position are holes in the ground where the feet of the tripod go, and the ones on the ships are red markers showing where to point the laser. After the machine has been put in position, the laser has to be pointed to at least 2 mini prisms of the 50 all around the ship; this is necessary to mark exactly where the machine is. After that, the operators can start to measure all the 350 red points on the ship, both inside and outside the hull. Since the great attention that the Vasa Museum pays trying not to compromise the integrity of the ship, all these marks have been placed precisely over pre-existing nail holes, and thus no new holes have been made on the surface of the ship. For this reason, the red points' disposition is random, and there is no symmetry between points on the two sides of the hull. To start the machine, a soft touch button must be pressed; then, the laser moves automatically pointing to the first marker. However, it is not precise, and human correction is required; to do it, a torch is directed at the point, so that the area is well-illuminated and perfectly visible on the machine screens. The operator manually adjusts the laser direction using the small wheels on the TS and then starts the measurement. When the first point has been marked, the machine automatically points to the second point, and again the direction has to be adjusted before the measurement. The same process is replayed for all the points that it is possible to see by the same position. After the machine has measured all the points, it turns the laser at 360° as a signal and all the points as to be measured again backwards. In the end, the machine compares the two sets of measurements. If it finds some errors, it shows it on the screen and the wrong measures must be taken again.

Total Station (TS).

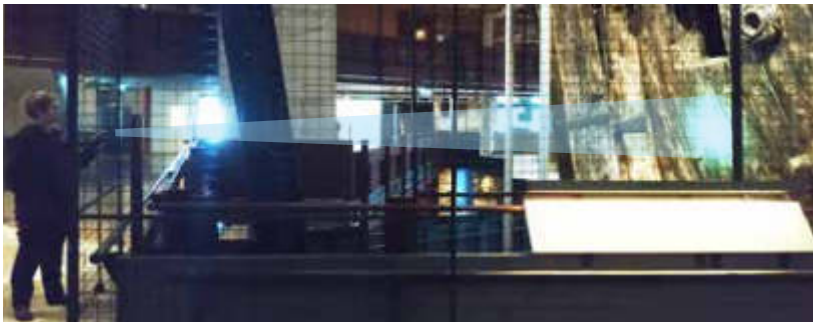
When there are no errors, the memory card is put in the computer to download the data. The same operation is made from all the positions around the ship and similarly inside the ship. Each red point is measured by two positions, in order to have a triangulation; thus in total, there are 4 measurements taken for each point. The result is a list of coordinates expressed in numbers that can generate a point cloud. Comparing the



On left and right: prisms in the ship (left) and around it (right) used to mark the position of the TS.



One of the red markers placed on the hull of *Vasa*.



One operator is lighting up a red marker with a torch, pictures by the author [May 2022].

results of every year, it is possible to see how and to what extent the ship has moved. Thanks to this operation, it has been revealed that the hull is slowly collapsing under its own weight. In order to prevent structural failure, a new project has started with the task of understanding how to stabilize the structure, maybe through new supports beneath the hull and the addition of reinforcement elements from the inside of the ship, without compromising the aesthetic of *Vasa* and the public's enjoyment.

2. Design of sculptures

Looking at *Vasa*, the decoration is one of the most impressive aspects. Sculptures cover almost all the hull in the stern, every gunport has a lion head on its lid, and the bow is enriched not only by a complex figurehead of a lion holding the coat-of-arms of the Vasa family, but also has two tiers of sculptures embellishing the projecting structure of the beakhead. The view is astonishing. In this great decoration programme, the symbolism leading to the meaning of the message sent through sculptures, and the aesthetic which shows the taste of the time, are both really fascinating points of view to study about *Vasa*'s decoration. These two aspects have been recently deeply investigated in the book *Vasa's sculptures* edited by Anna Maria Forssberg,[29] where they are analysed by important scholars from different fields, creating a complete and stimulating view of the subject. In parallel, from a design point of view, *Vasa* also represents an opportunity to understand something more about ships' decorations, something that no painting or model can probably show: the design process behind the realization of these sculptures. Looking at the maritime art, it can be appreciated the amazing decoration embellishing the ships portrayed, and in paintings with good details, it is also possible to understand what the sculptures and decorations represent. For example, in the painting *Before the Battle of the Downs, ...,* made by the Dutch painter Reinier Nooms (1623 – 1667), called Zeeman, the stern of the ship *Amelia* clearly shows the coat-of-arms of Frederick Hendrick (1584 – 1647), Prince of Orange.[30] Generally, the themes and subjects used in ships decoration can be identified from naval iconography and models.

Nevertheless, neither paintings nor drawings nor models are able to show how the sculptures were designed, how they were made, what the

[29] A.M. FORSSBERG (Ed.), *Op. cit*.

[30] P. KEMP, R. ORMOND, *The Great age of sailing. Maritime Art and Photography,* Oxford, Phaidon, 1986, pp. 27-28.

Regnier Nooms, *Before the Battle of the Downs, 21 October 1639, Showing Tromp's Flagship 'Amelia'*, c. 1639, National Maritime Museum, Greenwich, London, Caird Collection.

process used by sculptors and carpenters was for their creations, and how decorations were joined with the underneath structure of the hull. Not even documents nor written sources, such as naval treatises, contain this kind of information, since the decoration was not the main subject for shipbuilding. Documents can show the economical aspect linked to the artistic work, such as the prices paid to buy materials and the cost of hiring artists and sculptors, but no mention is made of the technical realization of the decoration. With this lack of information, *Vasa* is a precious resource for understanding the process of creation of these artistic elements. Indeed, thanks to the highly-preserved condition of her decoration, *Vasa* is able to reveal sculptors' and carpenters' secrets by showing almost all the sculptures in their context, still preserving for the most part joints, nails, and pegs used.

The study of this aspect represents a great opportunity to understand more in detail an important part of ship design of the 17th century as it was the decoration. *Vasa* is offering the chance to go under the surface, analysing and dissecting her sculptures almost in an anatomic way. In this way, it will be possible to answer questions such as: how sculptures were made? How they were fastened to the hull? Which was the process to

assemble them on the ship? Were they purely decorative elements or did they have a functional purpose? But not only technical questions can be made to *Vasa*. Actually, she represents the perfect case study to compare the iconography and models to a real example. *Vasa* will also be compared to some parts of other ships' decorations which still exist to see if some technical differences can be appreciated in geographical or chronological distances. Thus, this section will not discuss the subjects, themes, and symbolism of sculptures. The attention will be focused on the technical aspects of the decoration of *Vasa* and its design, trying, where possible, to understand how the two-dimensional decorations of paintings and drawings were actually made in the reality, the reasons and the logic behind the choices made.

Arrangement, volume, and weight of the decoration

As previously discussed, iconography clearly shows that although every ship had a unique decoration, the complex programme of embellishment followed a general and common scheme for all the ships. The decoration was not arranged randomly, nor was it evenly distributed on the hull. There were two areas where sculptures were generally concentrated: the bow and the stern. In addition, some decoration could also be found on the sides of ships, even if sides were the less ornate parts. This general scheme is confirmed by *Vasa*'s decorations.

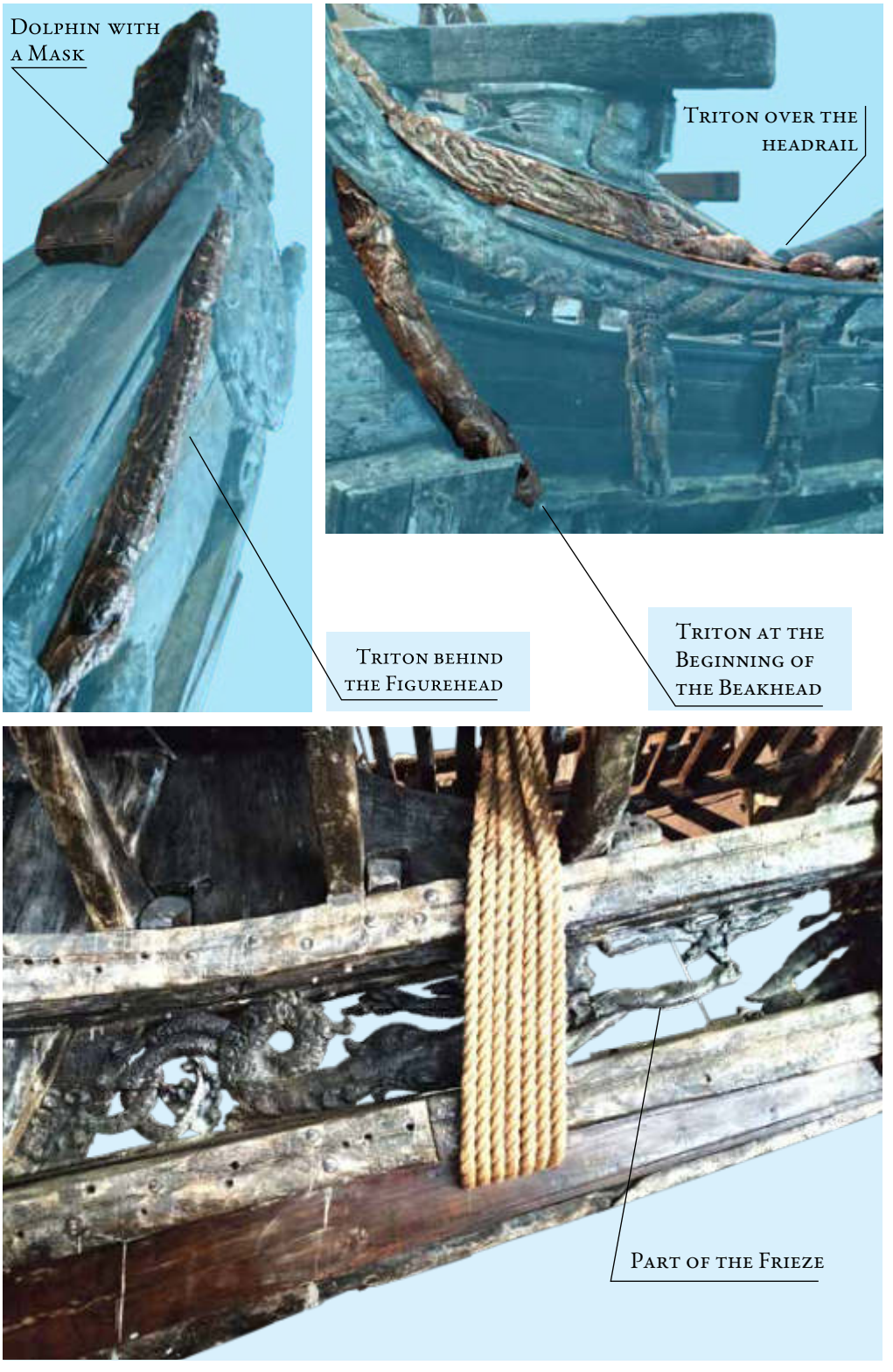
Bow – The bow is the front part of the ship, thus it is the one facing the sea during navigation, and the enemy when two fleets engage. It had always been an important element, maybe the most symbolic part of the whole ship since ancient times. Indeed, it was the place where sailors used to think the soul of ships was, and, in order to make it visible, they decorated it, usually painting on the beakhead, the front part of the bow, apotropaic eyes, which would have given to the ship the ability to *see* where she was going. Over time, this first attempt to give a visual location to the identity of the ship evolved, until in the 16th century the first figureheads appeared and continued to evolve thereafter. They could represent different subjects, from real emperors and kings riding their horses to sea creatures such as tritons and mermaids, or gods from ancient mythology. *Vasa*'s figurehead is a springing lion, a very common subject in the 17th century, especially in the Dutch navy. This is one of the largest sculptures of the bow and is 425 centimetres long.[31]

The other large sculptures are in the rear part of the beakhead, and

[31] H. SOOP, *The Power and the Glory. The sculptures of the Warship Wasa,* Kungl, Vitterhehets Historie och Antikvitets Akademien, 1986, p. 190.

The lion figurehead.

The warrior and the large triton.


Dolphin with a Mask
Triton over the headrail
Triton behind the Figurehead
Triton at the Beginning of the Beakhead
Part of the Frieze

A Roman emperor and other ornaments on the beakhead.

Male figures crouching under a bench.

they are the headrails carved with tritons long 450 centimetres and, just behind them, two two-meters tall sculptures (each for side) depicting a warrior.[32] There are other three tritons on each side, long from 222 to 266 centimetres, which are placed in different positions of the bow. On each side, one is behind the lion figurehead, one is over the big headrail triton, and the last is placed at the conjunction between the hull at the beakhead before the first emperor. The frieze in the lower part tells the story of the struggle between Peleus and Thetis – a meaningful scene of a man overpowering a sea goddess – while in the upper tiers, ten Roman emperors on each side traced an invisible line from the past to the Swedish "emperor" Gustav Adolf. Finally, some of the most unusual sculptures are the two "male figures crouching under a bench" placed under the cathead, one for each side. It was probably a humiliating way to represent Poles, which at the time were enemies.[33]

Looking from the outside, almost all the foreship is covered by decoration. On the contrary, watching the beakhead from aboard, the only carved elements that can be seen are the two Polish figures. Even the 27 small profiled ornaments place in groups of three between the Roman emperors are carved only on the side facing the sea, while they have a bare flat surface in the part visible from aboard. This makes clear that the decoration was not thought to amuse sailors and captains but to send a message to the people looking from outside the ship, even better if enemy than allied.

Beakhead structure seen from inside the ship.

[32] F. HOCKER, *Op. cit.,* p. 70.

[33] H. SOOP, *Op. cit.,* pp. 186-189.

One of the carved small elements seen from the inside of the ship (left) and the outside (right).

The kind of decoration of the bow of *Vasa*, enriched with large sculptures and numerous ornaments, was common in the 17th-century shipbuilding. It could seem a "bad design choice" that stressed the structure in consequence of the volume and thus the weight added to a projecting area. This is a perfect example of how valuable *Vasa* is in helping us to understand the ship-design of the past. Indeed, she gives the opportunity to move from conjectures, based on paintings, drawings, and scaled models, to real data and allowing calculation. Concerning the volume, some consideration can be made looking the decoration of a real warship, while that would be no possible using an iconographucal source. As it is known, the more volume there is, the more air resistance the ship has; however, looking at the decoration of *Vasa*'s bow, it is clear that it follows the aerodynamic shape of the beakhead structure, and even the large figurehead does not not project far from the side of the ship. For this reason, it is likely to affirm that decoration did not have a great impact in the air resistance, especially if compared to the cumbersome forecastles of 16th-century ships. Nevertheless, additional volume also means additional weight, which has always been a delicate issue in shipbuilding since it can directly affect the stability of ships. The ideal setting is to have it concentrate in the lowest deck, possibly in the middle section, to avoid pitch and roll phenomena. Having a random distribution of heavy elements, especially above the waterline, causes a movement of the centre of gravity from the ideal position, which is as central as possible. It means a change in the trim of the ship,* thus the shape of the submerged volume, causing a loss in manoeuvrability and speed. Moreover, more weight means also more draft, that is more immersed volume, that reduce in the same way the seaworthiness of a ship. Nevertheless, to understand if the weight of sculptures in the bow could really affect the ship seaworthiness,

Trim of a ship

The trim represents the longitudinal inclination that a ship has while its floating in the water and it indicates if the aft or the fore parts are deeper submerged than the other.

it is necessary to compare it to the total weight of the ship. Even if it is not possible to weigh every sculpture of the bow, it is still possible to estimate the weights reasonably.

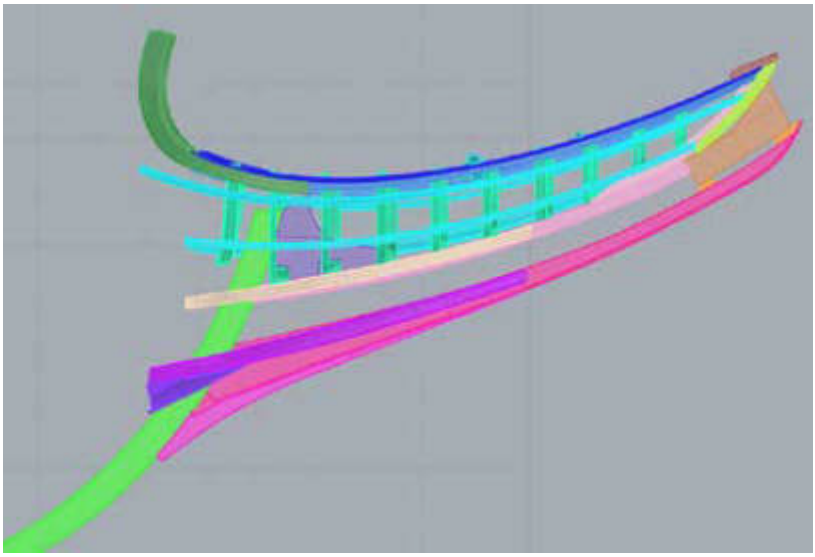
Method – To estimate the weight, two data are needed: the volume and the density. It is possible to get some pieces of information from the Vasa Museum digital archive on the Digital Museum[34] that reports linear dimension, material, and sometimes also the weight of many parts of the ship. Using the weight reported on the Vasa Museum digital archive, it is important to notice that some weights have been calculated after the preservation, that means, with many layers of PEG over the bare wood of sculptures. Although it is not possible to know exactly the weight of these layers, it can be reasonably assumed the weight of the sculptures is about 80-90% of the weight with PEG. When the weight it is unknown, it is possible to estimate the volume and calculate the weight knowing the density of the material. The sculptures are all made of linden, pine or oak wood; in the calculation, their density has been fixed, in the same order, at 560 kg/m^3, 470 kg/m^3, and 750 kg/m^3.

Omissions – It must be noted that not all the decorated parts have been considered in this count. In particular, the two supports for the cathead, and a upper rails had been omitted. The reason is that these elements have a structural or practical function (see later), and their presence aboard is not a consequence of the act of decorating the bow. Only sculptures with a mere decorative meaning have been considered in this count, except for the figurehead which, even if it is also a structural part (see later), it could have been lighter if it was not decorated.

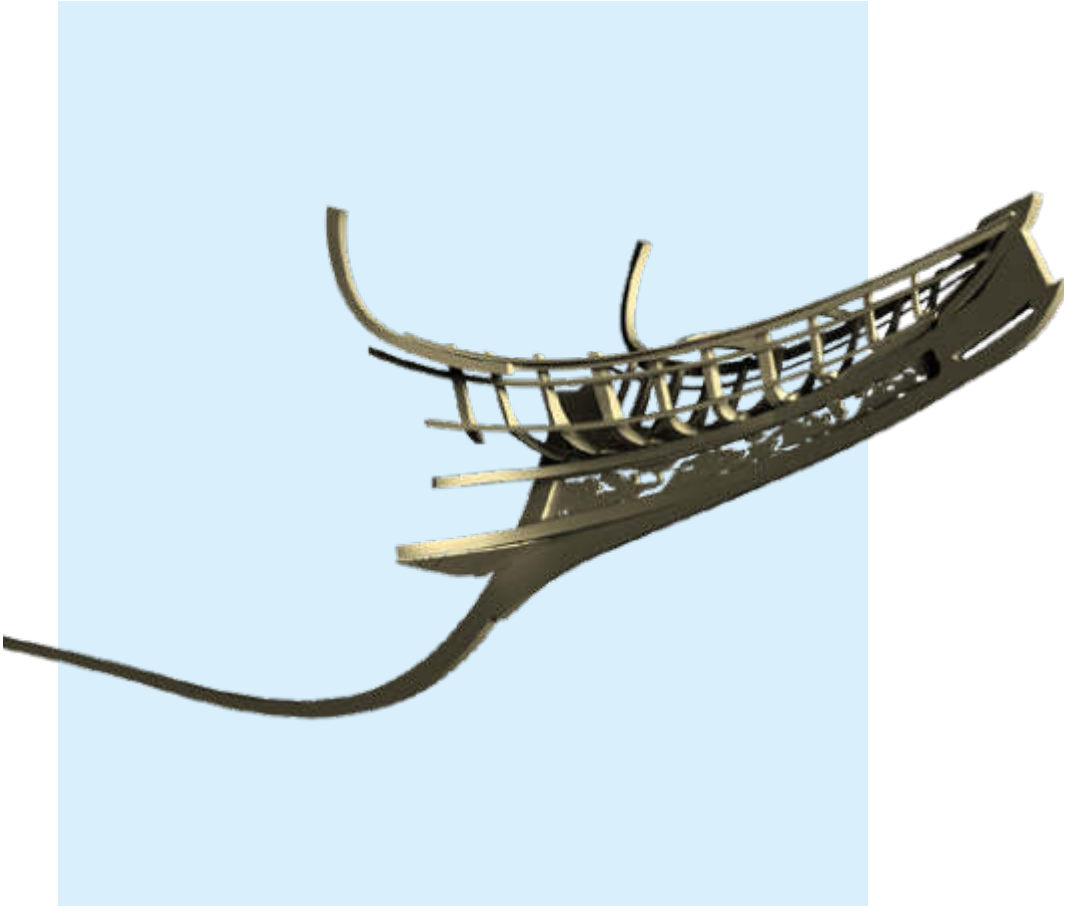
Calculation – According to the Vasa Museum archive website, the Roman emperor linden sculpture identified as *Antoninus Pius*, on the port side, is 24,9 kg[35] with the layers of PEG. Considering the weight without PEG as 80-90% of the total, the Roman emperor should weight about 22 kg. Following the dimensions on the archive, the emperor identified as *Otho* (1,190 mm) is just slightly shorter than *Antoninus Pius* (1,380 mm). Trying to calculate the weight of *Otho*, the result is almost the same. Assuming 22 kg as an average of the Roman emperors, the total weight of the original twenty sculptures is about 440 kg. In the space between Roman emperors' heads, there carved elements enriching the upper rail and their global weight is about 70 kg. Moreover, between every couple of emperors there are always three small ornaments, for a

[34] Link to the Vasa Museum digital archive: https://digitaltmuseum.se/owners/S-SMM-VM

[35] https://digitaltmuseum.se/021029018020/kejsare [Accessed May 2022].



3D model of the beakhead structure.



total number of twenty-seven each side, which create a sort of balustrade. These elements are made of oak, and the average weight of each ornament can be considered of 2 kg; the total weight of the 54 ornaments should be about 108 kg.

Along the length of the beakhead, in the lower part, there is a frieze that is 870 cm long and its weight is about 200 kg. The largest sculpture is the lion figurehead, made in linden, which weighs about half a ton.[36] On the head of the lion figurehead, there is a sculpture of a dolphin with a mask, long 141 cm and made of oak; it weighs about 80 kg. At each side of this dolphin, there is another small dolphin, which weighs about 25 kg. Others singular sculptures, present on each side, are the tritons placed one at the beginning and one at the end of the beakhead, both made in pine. The triton connecting the hull with the beakhead is about 94 kg while the one at the end of the beakhead is about 47 kg. Another large sculpture in the bow is the warrior placed at the beginning of the beakhead structure, and which is 255 cm tall. Originally they were one each side of the ship, and their estimated weight is about 100 kg each. The total weight is about 1900 kg that is like the weight of a 24-pounder demi-cannon used on *Vasa*.[37] It is nothing compared to the 1200 tons of displacement of the ship (the ballast alone is 120 tons).[38] Consequently, it is clear that the weight of the bow sculptures could not affect, in any way, the stability and the seaworthiness of the ship. Nevertheless, the mass of the decoration does not weigh directly on the hull, but on the beakhead structure. Indeed, the beakhead projects a considerable distance beyond the hull (*Vasa*'s beakhead is 10 meters long), and thus it has to support almost all the bow sculptures. For this reason, adding weight in this part could generate a critical and important stress to the structure. It must also be considered that, even if completely over the waterline, the beakhead was the part of the bow entering the water, and thus it had to resist also to a great pressure made by the continuous blows of waves. In the same way as before, to understand if bow decoration could really compromise the beakhead structure, the weights must be compared. In this case, the weight warriors (almost 100 kg each) has being removed from the total weight, since these two sculptures are fastened directly to hull, and do not weigh on the beakhead. The sculptures weight is then about 1700 kg. To calculate the total weight of the structural elements of the beakhead, a 3D model has been created, starting from a point cloud. Once the volumes were recreated, they have been multiplied by the density (oak) and the weight has been calculated is about five and half tons.

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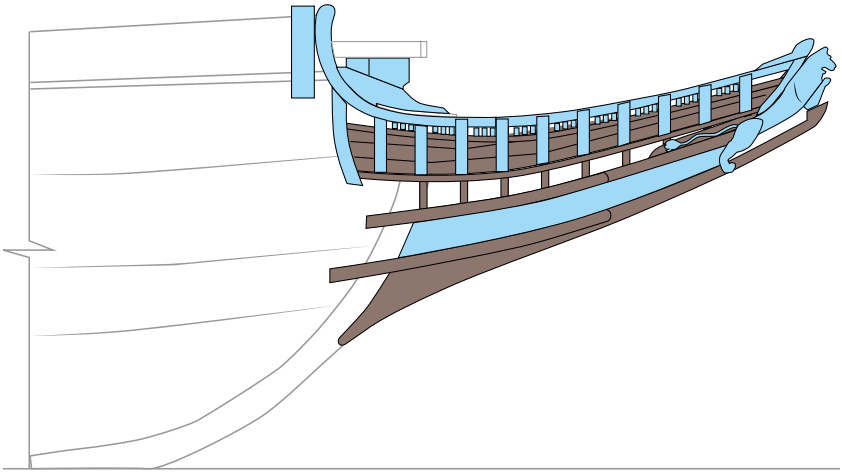
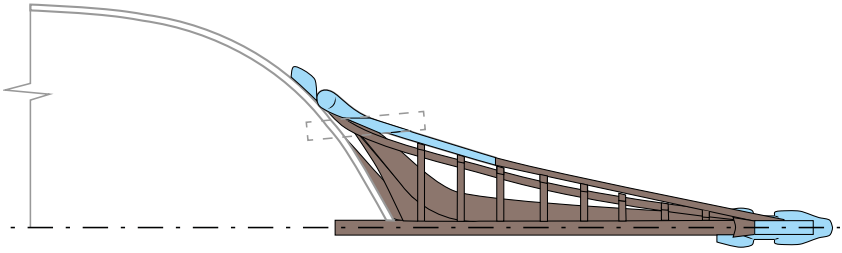
[36] E. HOCKER, *Op. cit.*, p. 62.

[37] F. HOCKER, *Op. cit.*, p. 134.

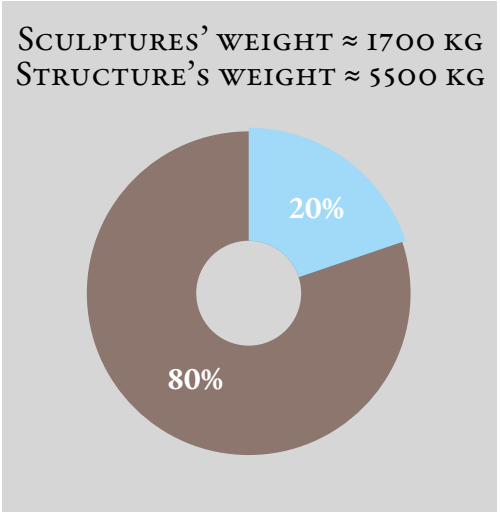
[38] C.O. CEDERLUND, et al., *Op. cit.,* p. 360.

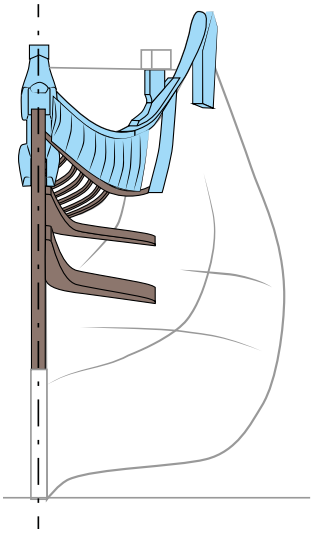
Thus, the sculptures' weight is 30 per cent of the structures' weight, and it represents 20 per cent of the beakhead weight.



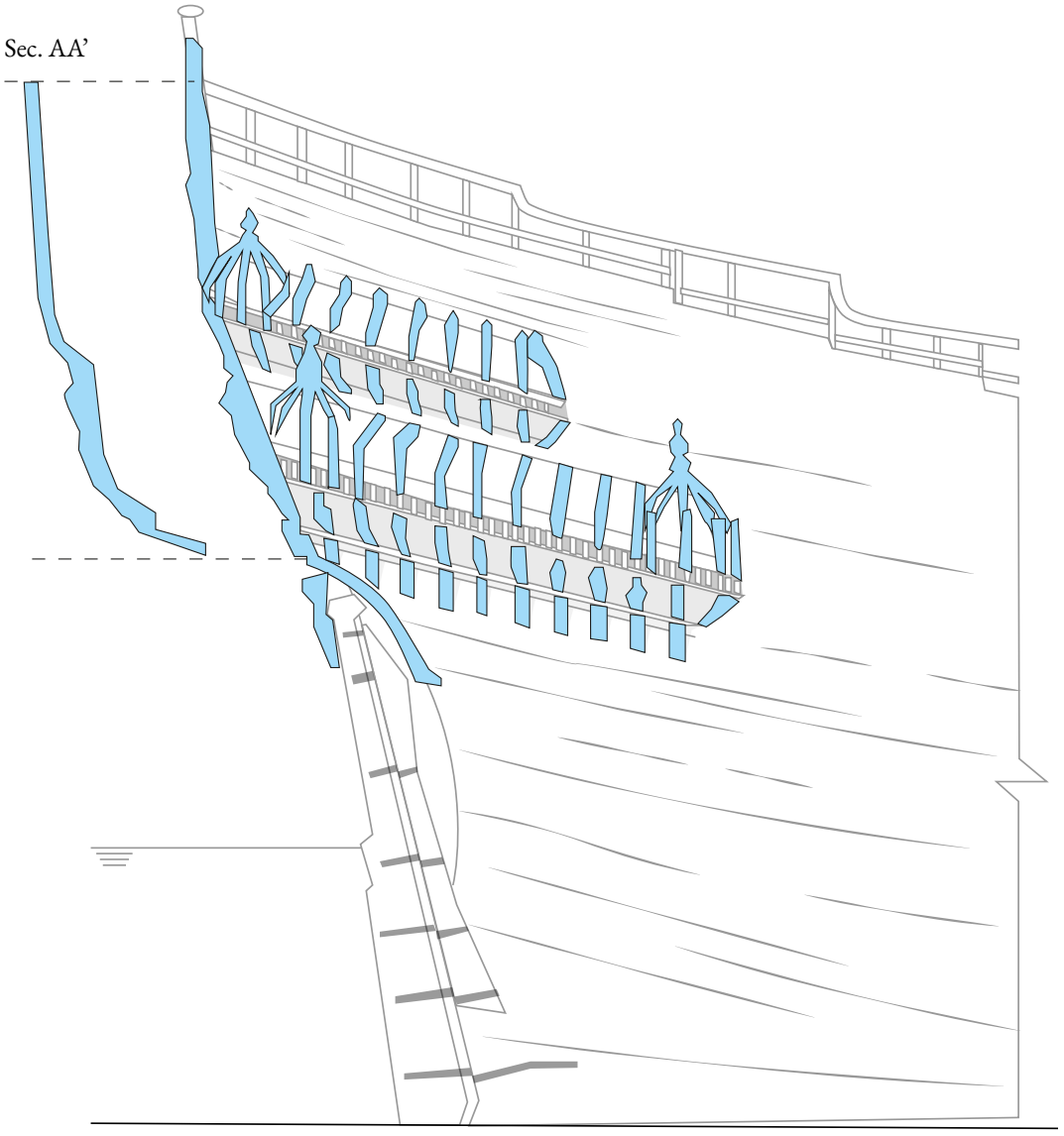


Schematisation of *Vasa*'s decorations in the foreship.

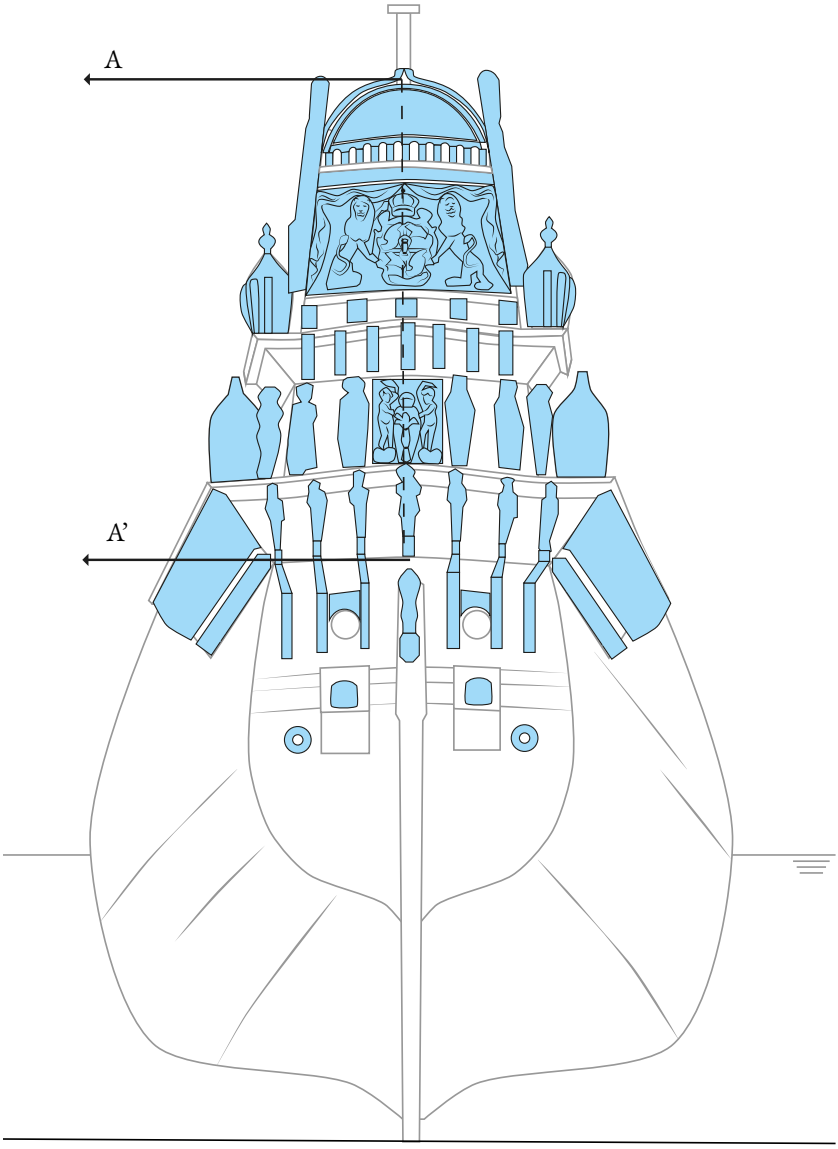




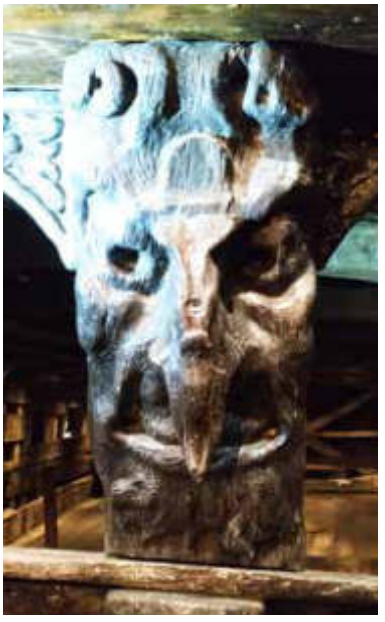
Stern – The most decorated part in all the ships of the 17th century was the stern, and *Vasa* is not an exception. The decoration is covering almost all the space from the top to the waterline, leaving only few sections where the structure behind is visible. The decoration of the stern continues in the quarterdeck, surrounding the aft part of the sides with the projecting galleries. Differently from the beakhead, in the stern all the sculptures and the galleries are fastened to the hull and their weight. Even if the visual effect is strong, these decorations are nothing compared to the 1200 tons of total weight of the ship, and thus they do not influence the seaworthiness.



The proportion is particularly clear looking at the profile. Indeed, the volume of the decoration is paltry compared to the rest of the ship and with the dimension of the structure inside. Nevertheless, large and heavy sculptures are present in the stern, and a calculation of their weights could show how they stress the local structures on which they rest. For example, the sculpted masks under Sweden's coat of arms, made in pine wood (470 kg/m^3), have weights ranging from 10 to 15 kg, for a total of approximately 60 kg. And looking at them carefully, it can be noted that some changes in their shapes have occurred due to the shrinking of the dried wood, and this has modified the way they are connected to the structure underneath.

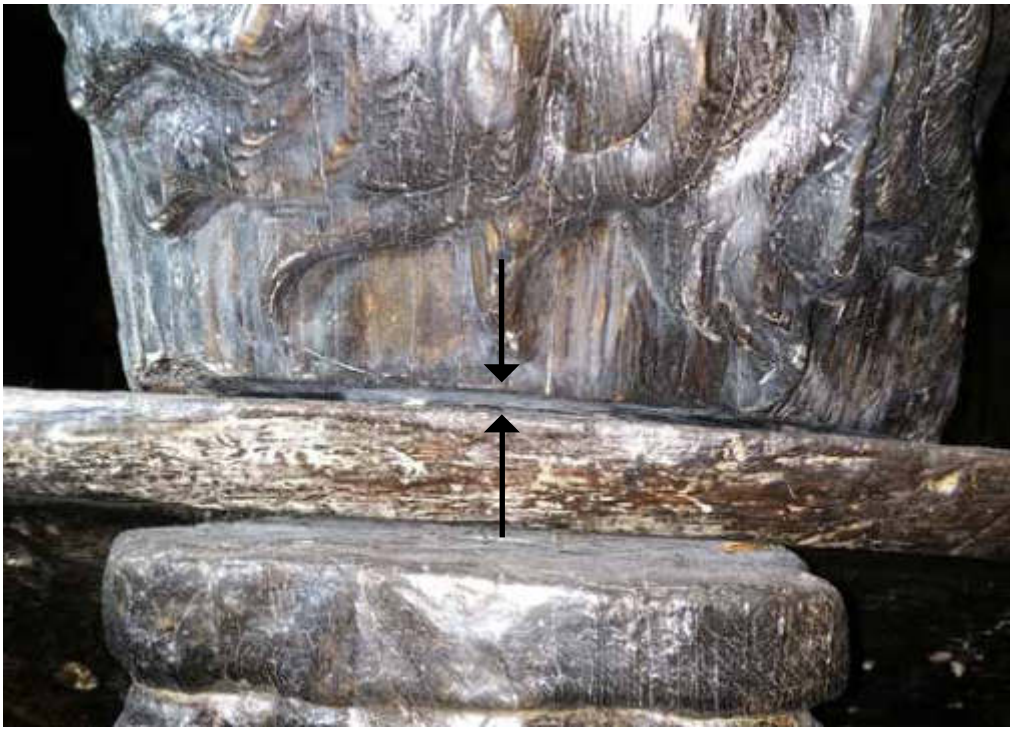


Schematisation of *Vasa*'s decorations in the stern.



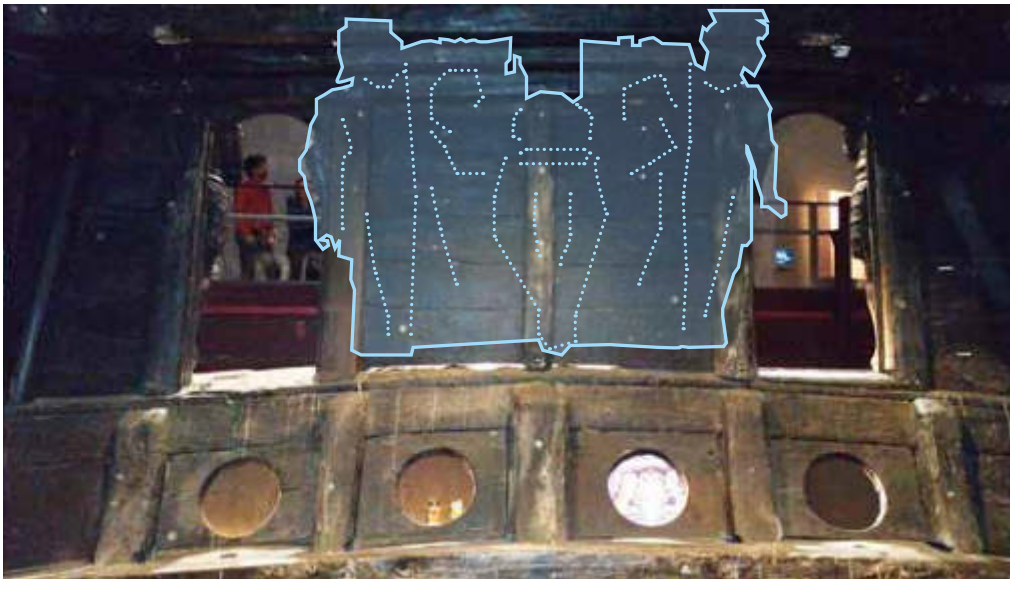
For instance, one of them had the lower section clearly detached from the shelf below, and that means that it is completely hanging on the structure behind.

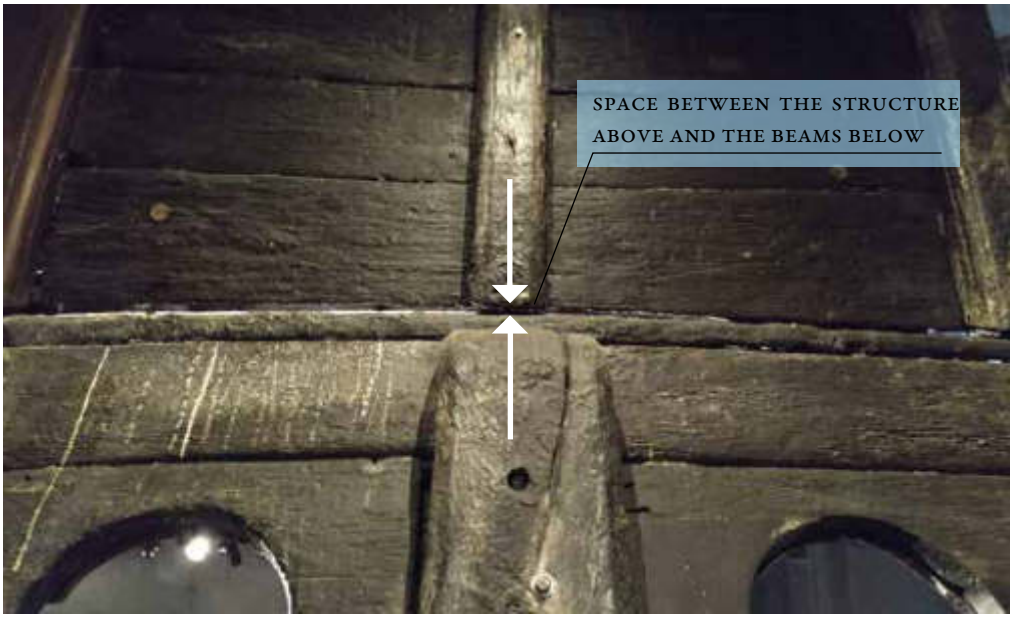
In the two pictures below: zoom of the mask's base.

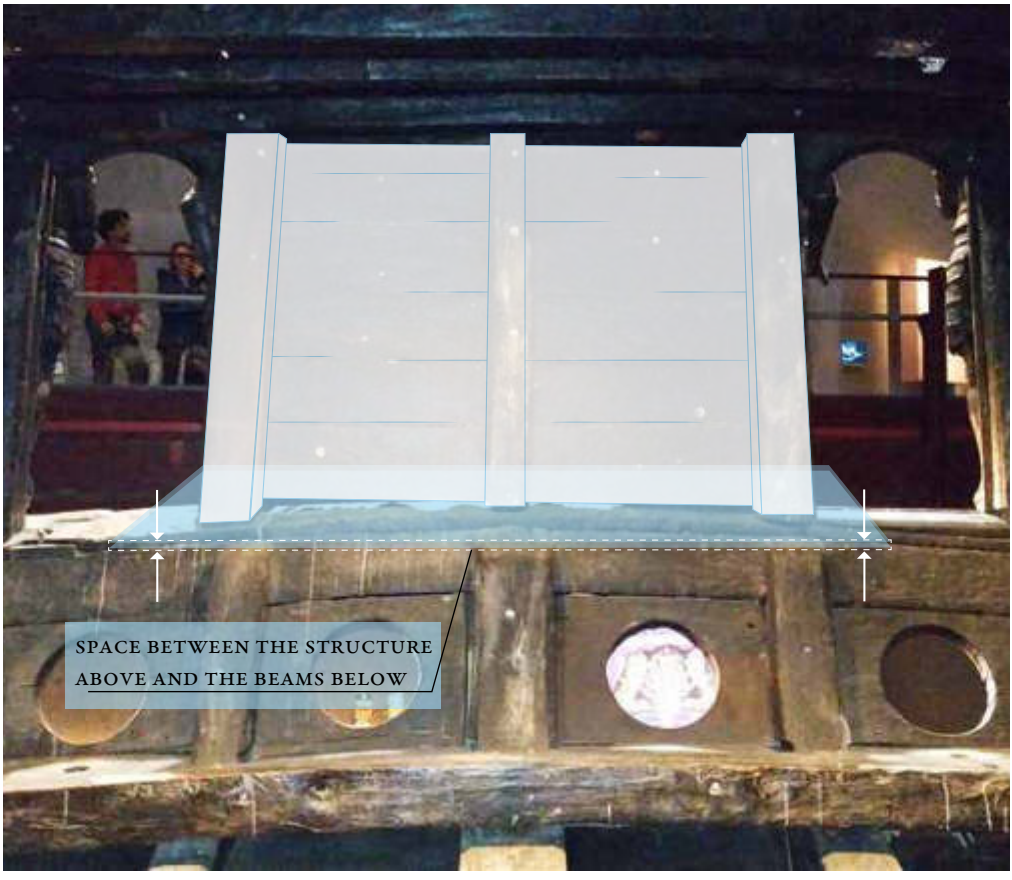


Considering another example, the six human-sized knights in the first gallery, made also of in pine wood, have a considerable weight of about 70 kg each. Like the large masks, a careful examination can reveal how these large sculptures interact with the structure. Looking from inside of the ship, it becomes clear that the shrinking of wood has created some empty spaces where they should not be. This is especially evident in the central section, were the two knights are at the side of the cherubs holding the Vasa family's coat of arm. This group of sculptures is nailed to three beams that do not lean on the horizontal beam below. Thus, these sculptures, which should have a total weight of at least 200 kg, are completely hanging on the transversal beams over them.

The central group of sculptures from outside (above) and their position seen from inside (below).





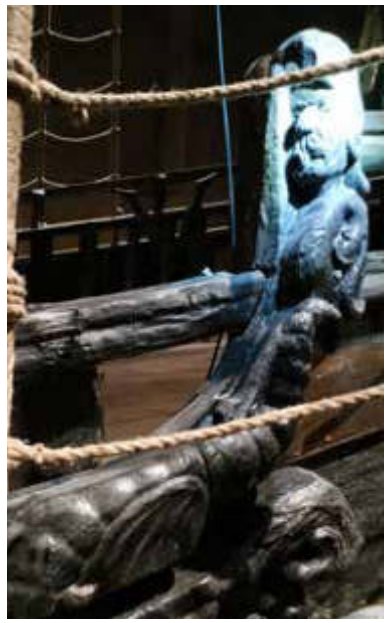


Details of the structure inside the ship holding the central group of sculptures.

Sides – Contrary to the stern, the sides are the less decorated part. Nevertheless, sculptures are numerous and homogeneously arranged so that there is not a section more adorned than another. In the upper deck, the round gunports are all enriched with wreaths, and the are several stanchions, originally seven each side, carved with the shape of Proteus.[39] Moreover the support for the main sail tack (about 70 kg, according to the data on the digital archive), is carved with a beastly human shape. In the lower section of the hull, the only carved elements are the lion heads placed one for each gunport lid. Clearly, the weight and volume of this decoration would have a minimal affect on the seaworthiness of the ship.

On the left: wreath on a circular gunport.

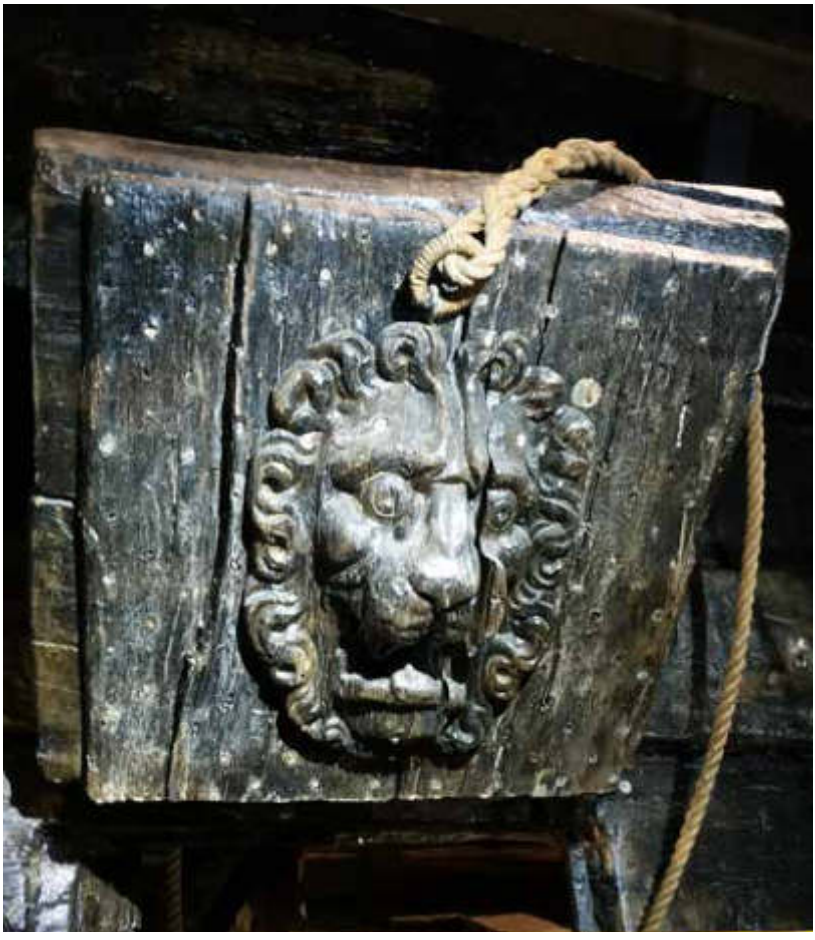
On the right: stanchion.



A stanchion and part of a wreath on the port side.

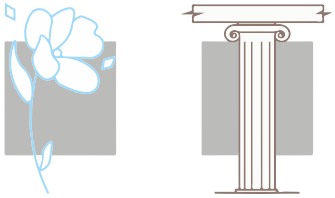
[39] A.M. FORSSBERG (Ed.), *Op. cit.*, pp. 114-115.

The lion heads have an average dimension of 50×40 or 45×30 cm with a maximum width of nearly 15cm (in the middle of the sculpture) and they are made mostly of lime wood although some of them are of oak or pine wood. The lion mask identified with the number 21262, made of pine wood, is 44,5×44,5×21,5 cm and weighs 12,5 kg.[40] There are 54 gunport lids on *Vasa*, and originally every one had a lion mask. Assuming as average weight 12,5 kg, all the lions would add 675 kg to the ship, not considering the support behind them, which adds extra weight. As for the decoration on the beakhead, almost 700 kg is not much compared to the weight of the entire ship. Nevertheless, even if this would not influence the ship's seaworthiness, a single lid is made heavier by the weight of decorations and this had a repercussion on the operations on board; indeed, as a consequence of this extra weight, the lids are heavier and more difficult to lift, thus requiring the presence of more than one man.



Lion mask on a gunport lid.

Structures, supports, functional elements, or pure decorative sculptures?

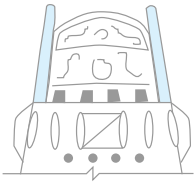


The decoration had a great importance as a tool to send a message and all the different sculptures contribute to perfect this iconographical *manifesto*. However, within the main part of sculptures that finish their function in this decorative and propagandistic aim, there are a few cases of sculptures that also have an additional function. In a scale of relevance, these functions could be gathered as: structural, support, and functional. "Structural elements" refers to all the parts that work together to maintain the hull's structural integrity. "Supports" are the elements that sustain decorative or functional parts but are not involved in the support of the hull structure. Finally, "functional elements" are those parts that have a precise aim on board as part of the sailing operations. By looking at the sculptures, it is possible to understand if they can be considered part of one of these three categories, or if they were just decorative elements with no other functions.

Structural elements (on the bow) – Generally, decoration can be considered a beautiful clothing that was put on the bare hull with the main goal of embellish the external part. Thus, sculptures were a supplementary element added over the structure. Considering the high number of sculptures present on board, the ones which also are structural elements are very few. Nevertheless, they had an important role in the construction process and are essential to stabilize the structure and keep the integrity of the ship. In this section, the beakhead will be the only part of the ship used as example. The sides do not have any sculpture which is also structural, considering the stanchions with human shapes as supports and not part of the hull. The only structural elements in the stern are probably the two corner posts.* Further studies on the other decorations, could still reveal other structural elements among the sculptures on the ship.

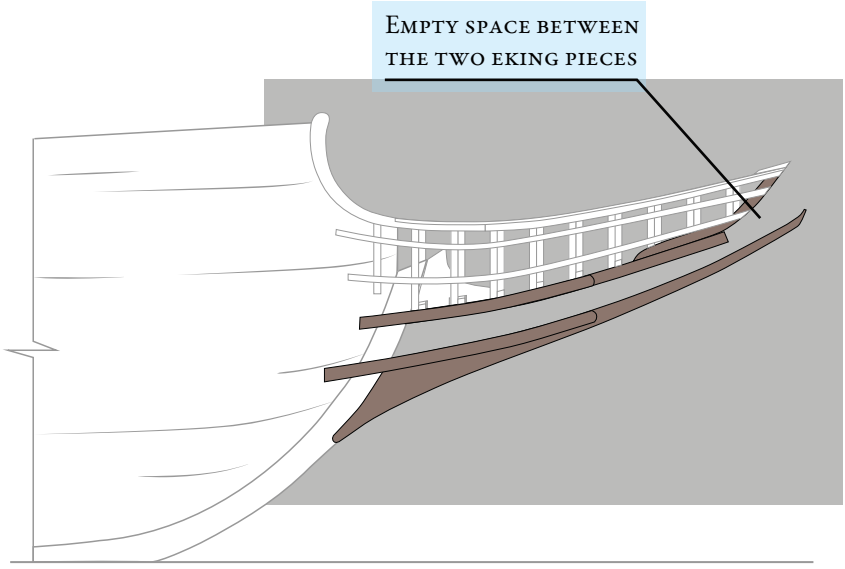
*Corner post

The corner post (or quarter post) is a sturdy post fitted on each of the two corners of the stern.

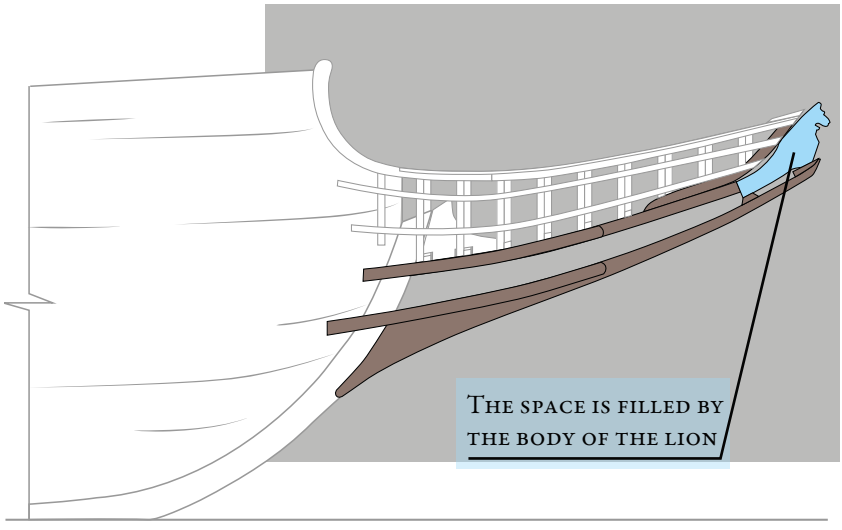


> The figurehead, which is one of the largest sculptures, is for the most part a structural object. Indeed, the lion is made of different parts carved separately and nailed together, and while the tails (there is one tail each side), the legs and the mane are purely decorative elements, the body of the lion is the element of conjunction between the two eking pieces of the beakhead, which are the two beams that directly supports the beakhead basket. The structural role of the figurehead becomes clear when one

imagines completely removing it from the bow. Without it, a large empty space appears between the two main supports of the beakhead. That means that without it, the two eking pieces would not touch each other and consequently, the lower beam could not help the upper one to support the beakhead basket. Thus, the role of the figurehead is not just decorative. The beakhead could not resist without it, and that there must be an element there, even if the ship was not decorated at all. For this reason, the beakhead can be considered primarily as a structural part, embellished with carvings and other elements added to the body, rather than a decoration.

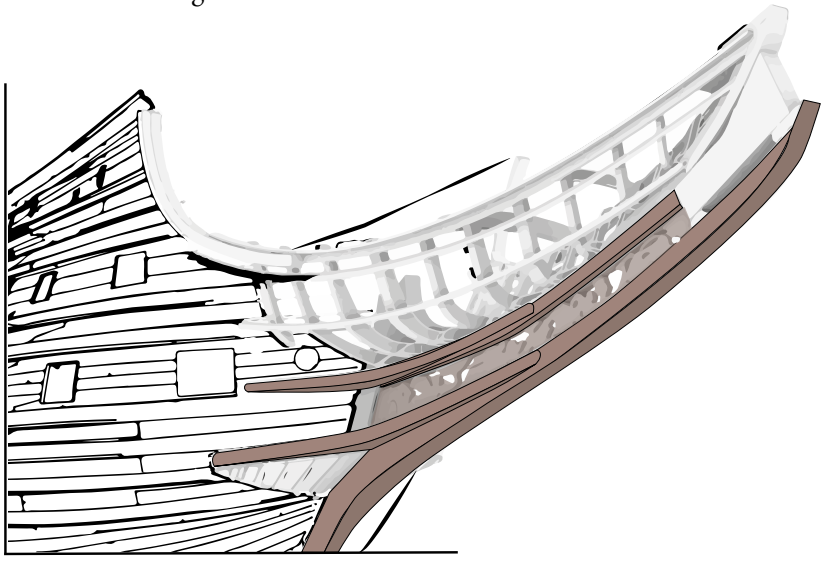


Structure of the beakhead without the figurehead

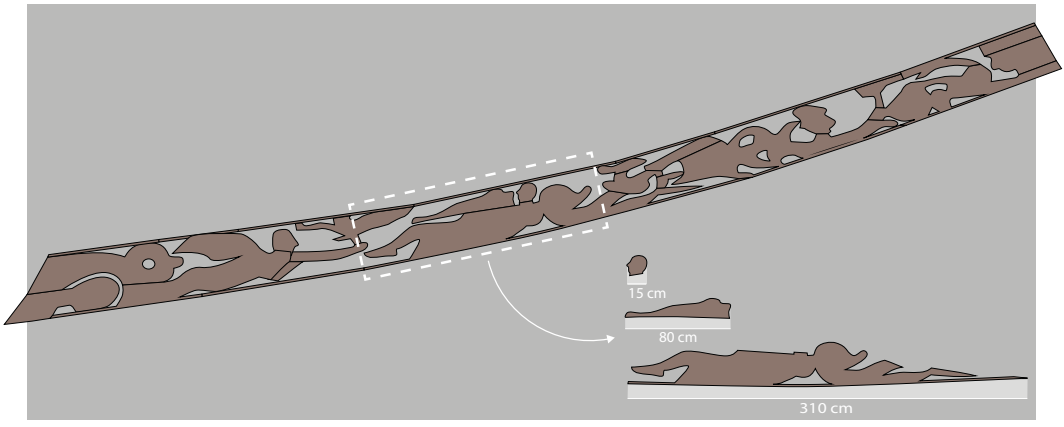


Structure of the beakhead with the figurehead

> The frieze covers a large portion that was otherwise completely empty, and was placed between the two eking pieces, which support the whole beakhead. One could ask whether it had a structural function too, despite its narrowness. Trying to answer to this question, it is important to understand how this element was made and this is possible thanks to *Vasa*, which has a well-preserved frieze. It is 8,70 meter long, carved in oak, and its weight is around 200 kg. It is not a single piece of wood but it is composed by a group of sculptures fastened together by pegs, which have the diameter of about 1,5 cm. The sculptures create a very articulated pattern and are at least twenty, even if in some section it is not possible to distinguish if the space between two parts is a crack or if they were originally carved separately. Some of these parts are quite large, while others are just small details. For instance, in the middle section there is the longest piece, which represents a man's body and is about 3 m long, and also one of the smallest parts, which is the head of the same man, that is about 15 cm long.

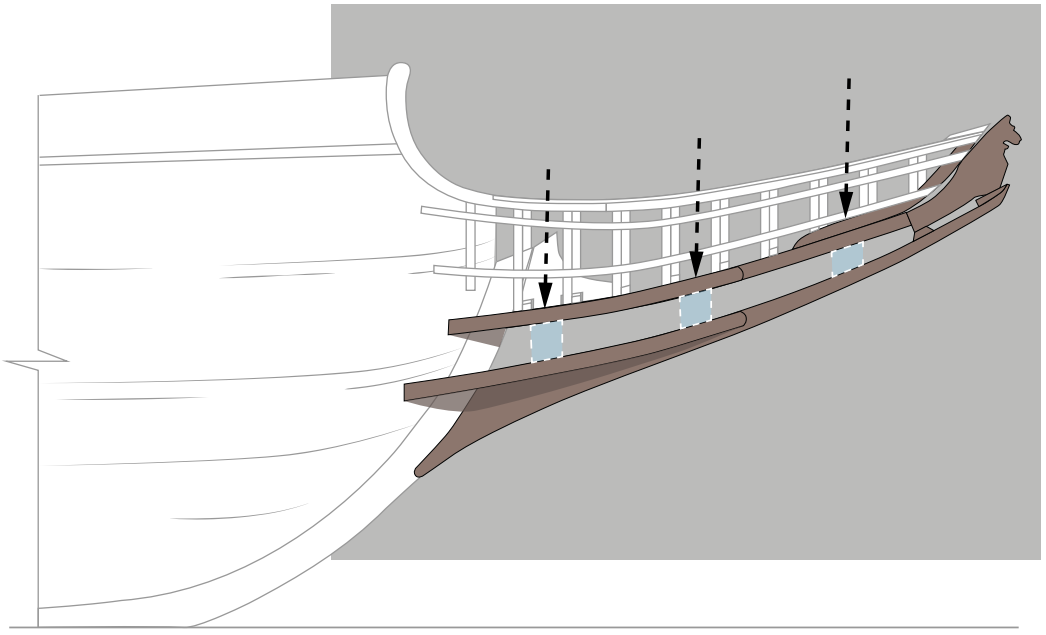


Frieze on the beakhead of *Vasa*.

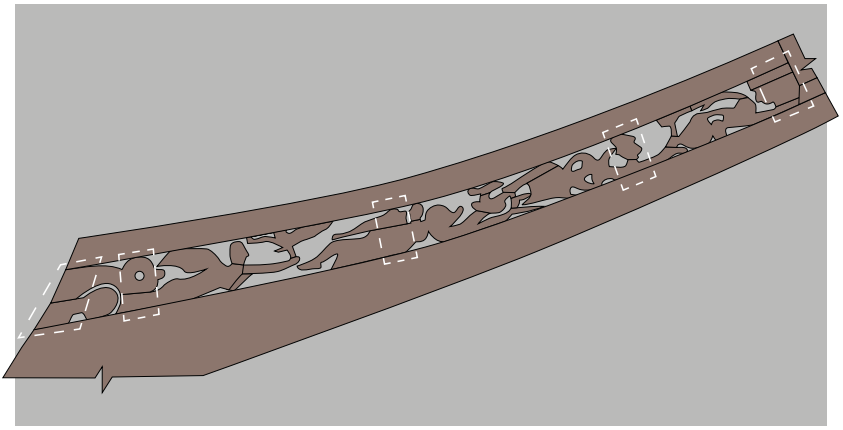


Below: frieze of *Vasa* with the smallest and the biggest sculptures.

Independently from the number of blocks, the section should fill almost completely the space between the two eking pieces to be an active part as a support for the beakhead. In the frieze of *Vasa*, the sculptures have mainly oblique angles or pierced shapes. It means that the connection between the two eking pieces is not filled, leaving between them an empty space that made the section not structurally useful. For this reason, most of the frieze cannot be considered of any help for the structure. Nevertheless, there are five sections that could actually create a resistance against the pressure, and these fulled-in sections are spaced regularly along the length, giving a homogeneous support. Even if it is not possible to know whether it was made in purpose, it actually shows a good design for also a mainly decorative element could find its usefulness.

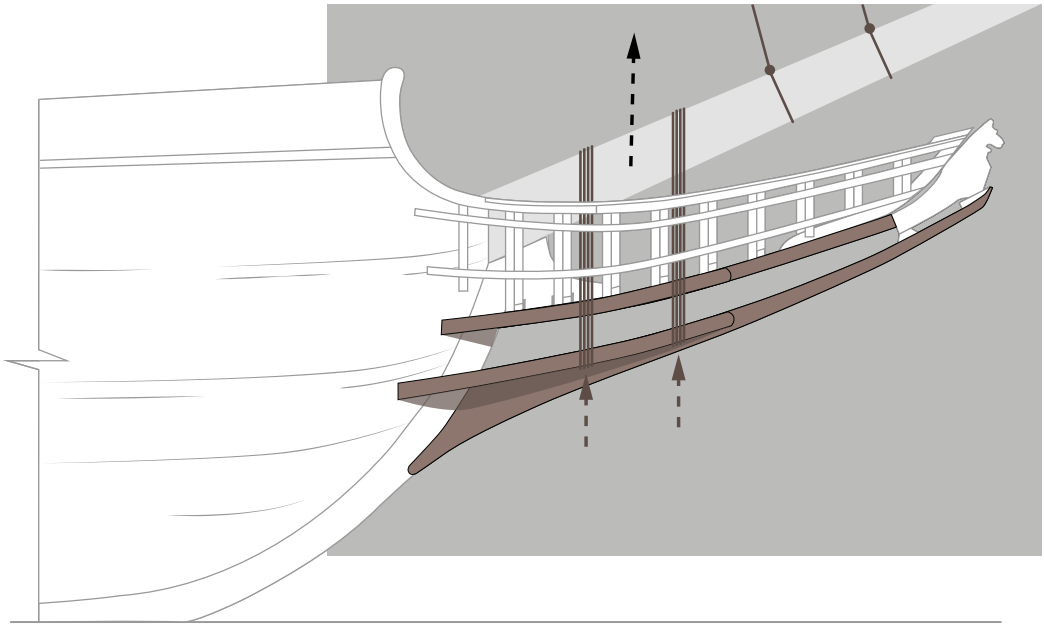


Only a "full" section could help to resist the force.

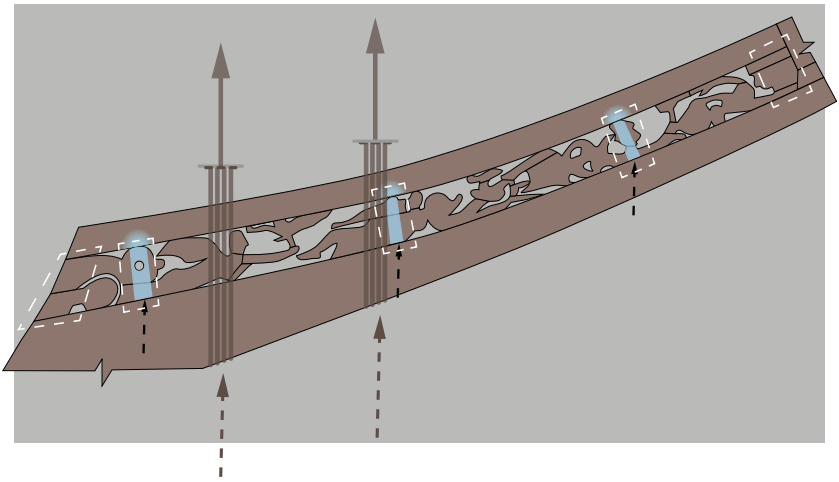


Five "full" sections on the *Vasa*'s frieze.

Moreover, without the frieze, the two eking pieces would have only a connection in the figurehead body and almost all the length would be empty. From this point of view, the frieze appears as a precious help to spread the stresses throughout the longitudinal structures. Moreover, when a ship was sailing, the beakhead was also exposed to traction generated by the bowsprit. Indeed, the bowsprit is not only a heavy element that generates a pressure but it is also connected to the sails and ropes that pull it up. The base of the bowsprit lay over an element on the beakhead and then gets inside the hull, where a structure, made of strong beams, keeps it fastened to the hull. Except for this section, all its length is projecting outside and in the higher part is connected by ropes to the foremast. If there were no other elements, when the bowsprit generated



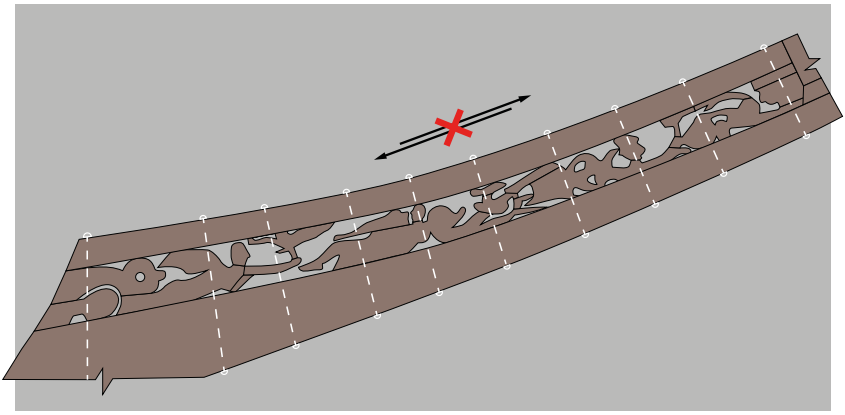
Force applied by the bowsprit and spread to the lower eking piece by the ropes.



Force spread from the lower to the upper eking piece by the frieze.

a traction, this force would stress only the parts at its base. To spread the force on a bigger area, some sturdy ropes were connecting it to the lower eking piece. Thus, this force was translated into a pressure from the underside. If the space between the two eking pieces was empty, the lower beam should resist almost by itself to that force. The presence of the frieze can probably be of some help. Firstly, since it rests to the lower eking piece, its weight of 200 kg acts, in this case, as a counterforce pushing in the opposite direction. Secondly, when pushed up, that few full sections press against the upper eking piece, that is in this way participating in resisting to the bowsprit traction.

There are other elements in the frieze that should be considered as structural. This are ten iron nails fastening the frieze to the eking pieces. They pass through the sculptures of the frieze and the two eking pieces. Even if nails do not have any purpose in resisting the pressure, they have an active structural role in holding together the three parts (the two eking pieces and the frieze). Their main role is that to fasten the frieze to the beakhead but at the same time they also reinforce the connection between the two eking pieces, avoiding the shift between them and any other horizontal movement.

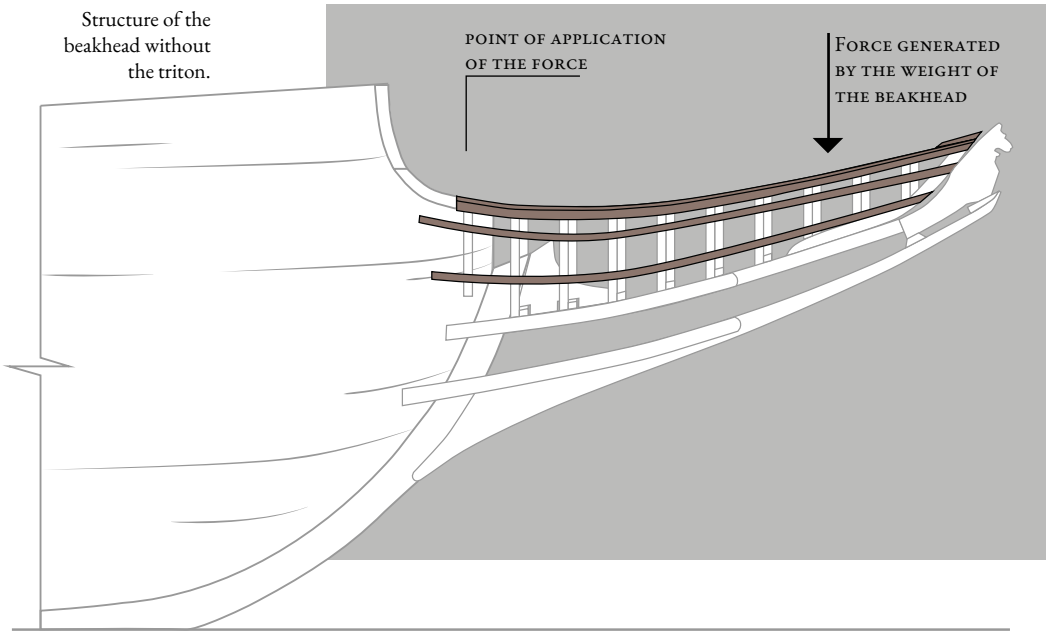


The nails in the frieze prevent any horizontal shift between the two eking pieces.

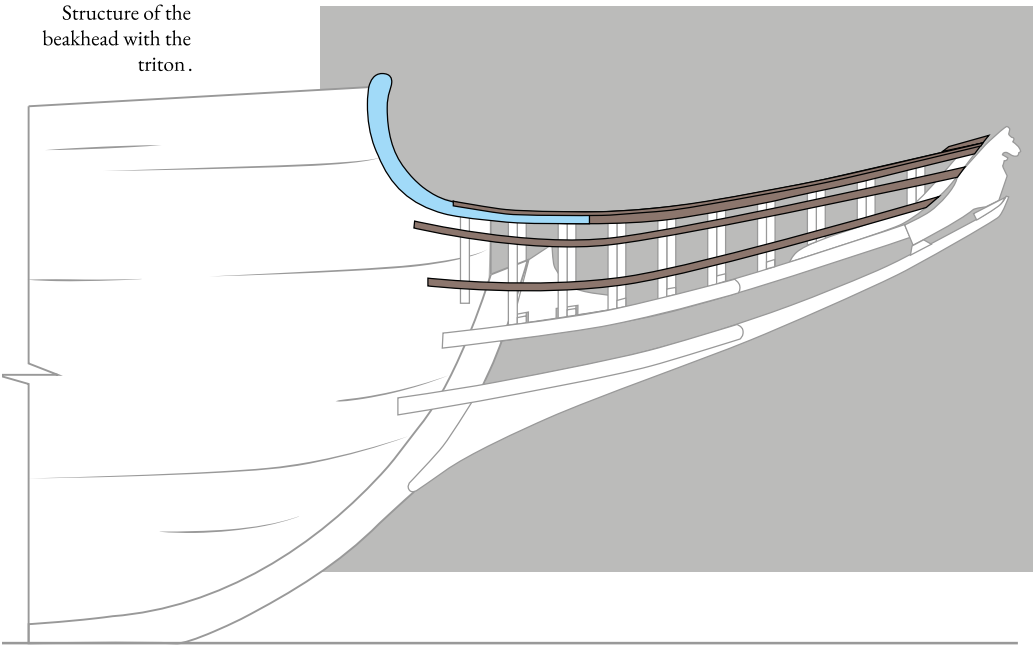
For these reasons, even if the frieze is for most of its sculptures a decorative element, it still had a role in helping the structure, and if it cannot be considered a proper structural part (which means that even without it, the structure would stand), it can be considered an important element for the stability of the beakhead.

> The large triton at the beginning of the beakhead is another element that can be considered mainly as structural part. It is the first section of the curved upper rail and, together with the other half, forms the upper connection between the hull and the beakhead. Trying again to imagine the bow without this part, it is possible to understand its function. It is the main lateral connection between the beakhead structure and the hull in the upper part. Without it, the beakhead would be weak and probably not

able to resist to the stress generated by the weight of the whole beakhead. Indeed, the only two upper planks and the middle beams, would not offer a strong connection because of the little surface provided and the thinness of these elements. Instead, the triton provide a large area, and sturdy part where many treenails can be placed creating a strong connection.



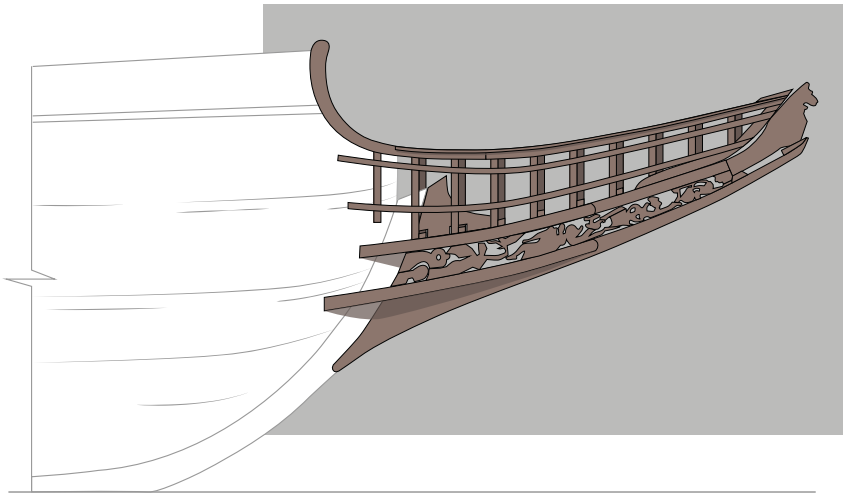
Structure of the beakhead without the triton.



Structure of the beakhead with the triton.

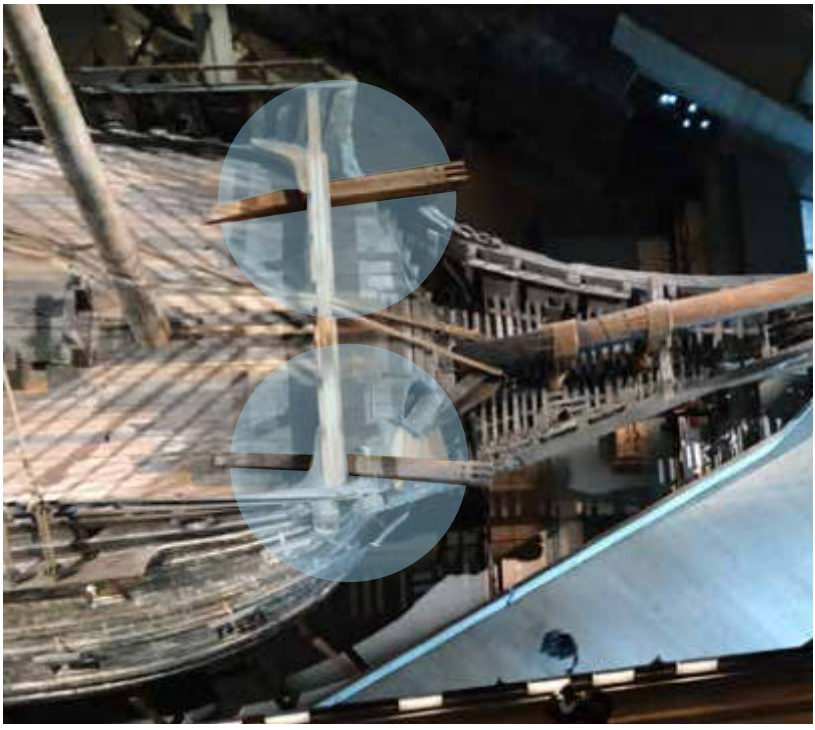
Expect from these elements, all the other sculptures are mainly decorative, and even if some of them could contribute to strengthen the structure, they are not really necessary for the support of the beakhead. Looking at some 17th-century maritime paintings showing less decorated ships, it is possible to see the almost completely bare structure of the beakhead, not covered by almost any decoration. Trying to think of *Vasa*'s beakhead without all the decorations and comparing the result with the paintings of bare beakhead examples, a clear similarity can be seen. Indeed, even in the painted ships, the only decorated elements are the figurehead, the frieze and the head of the upper rail. Thus, it shows again that these parts were necessary to the construction of the beakhead, while all the other decorations on the bow can be considered as "non-structural" elements.

Detail: Willem van de Velde (II), *Dutch Ships in a Calm Sea*, c.1665, Rijksmuseum, Amsterdam.

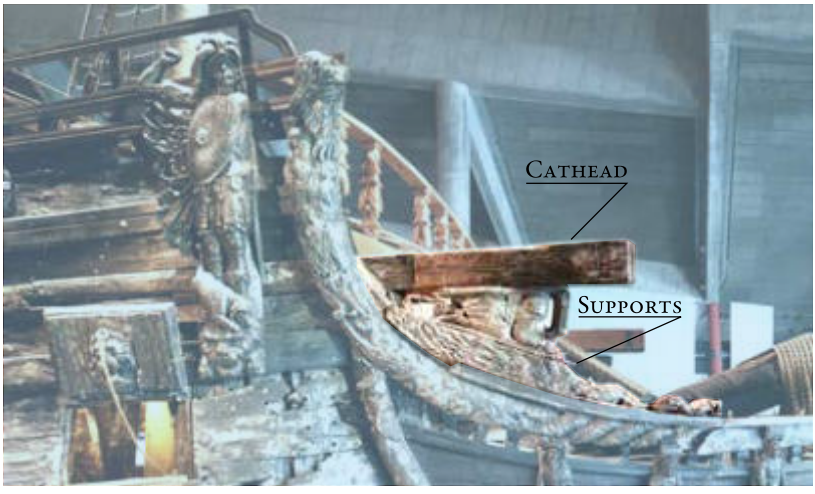


Vasa's beakhead structure without decoration.

Supports – They are defined here as the elements that sustain decorative or functional parts without supporting the hull structure. An example is the sculpture of the Pole crouched under a bench and the triton under it, in the bow; indeed, this element is not just part of the decoration but is the support for the cathead. As for the structural parts, this element could not miss since a support in that position is necessary for the sailing operations. That means that the ornament is just secondary to its function.



The two catheads on *Vasa* seen from above.



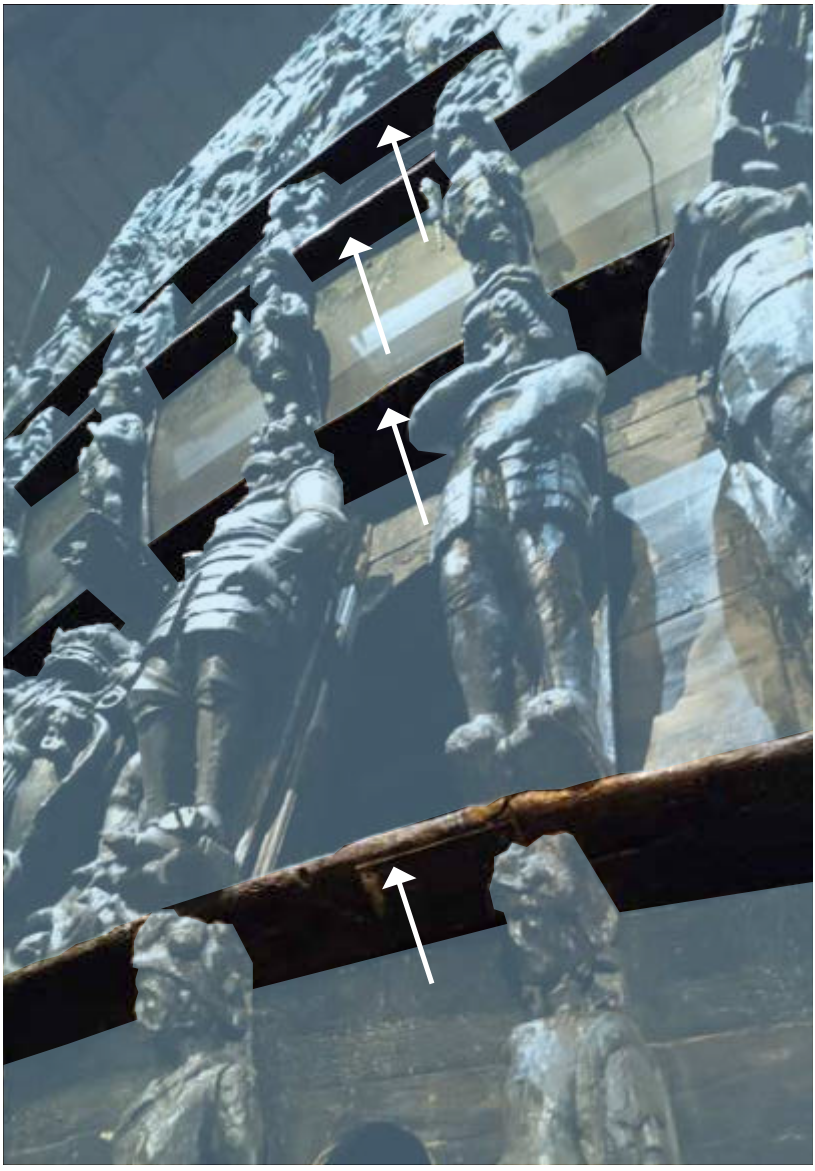
The starboard side cathead and its supports.

Also in the stern there are carved elements which are supports. In particular, they are the consoles carved as birds, grotesque masks, and human bodies supporting the sculptures on the galleries.[41] As a consequence, sculptures are supporting upper sculptures, creating like vertical columns that runs through all the height of the galleries.

The disposition of sculptures on the galleries makes them appear as vertical columns.

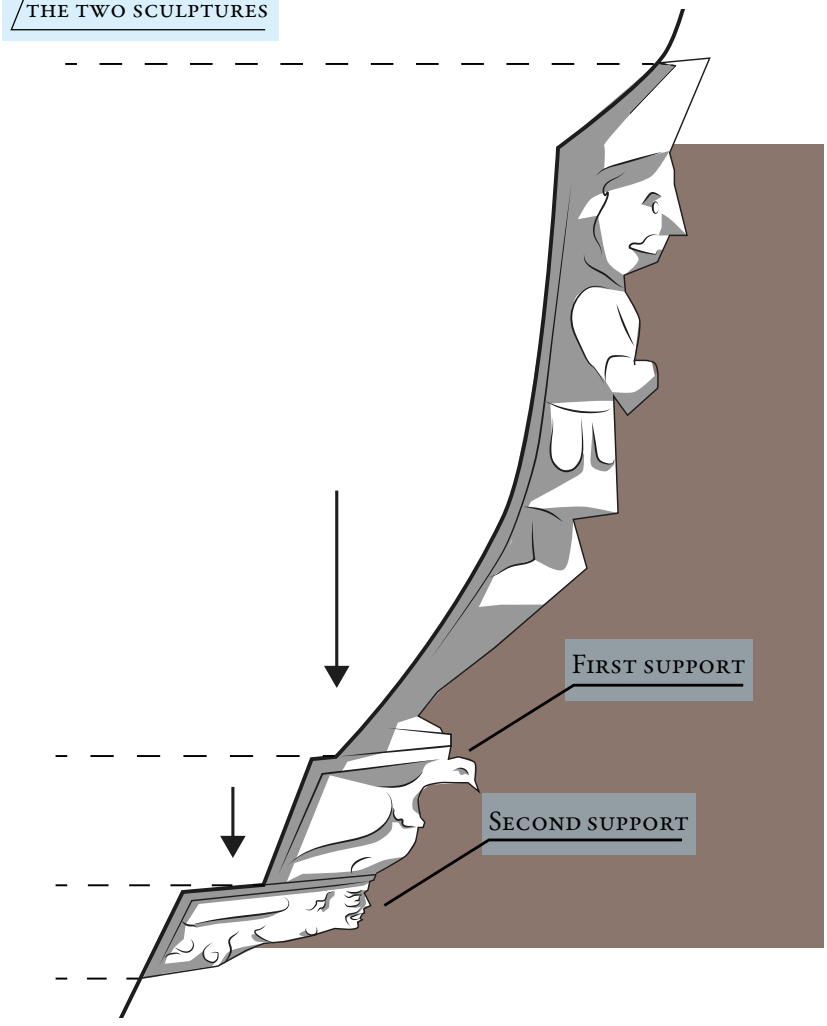
The same effect of columns is present also in the quarter galleries.

Even though almost all the sculptures in the stern are arranged in a straight line, in the upper sections there is always some horizontal element acting as a support and dividing a tier from the one below. This means that even though sculptures are helping to support the weight, they are not the main, or at least not the only, support. The condition is completely different in the low part of the stern and in the lower sections of the quarterdeck galleries. There, sculptures are directly attached and nailed to the ones below them, the primary function of which is therefore support rather than decoration.



View of the stern decorations seen from below. Horizontal supports are highlighted and indicated with arrows.

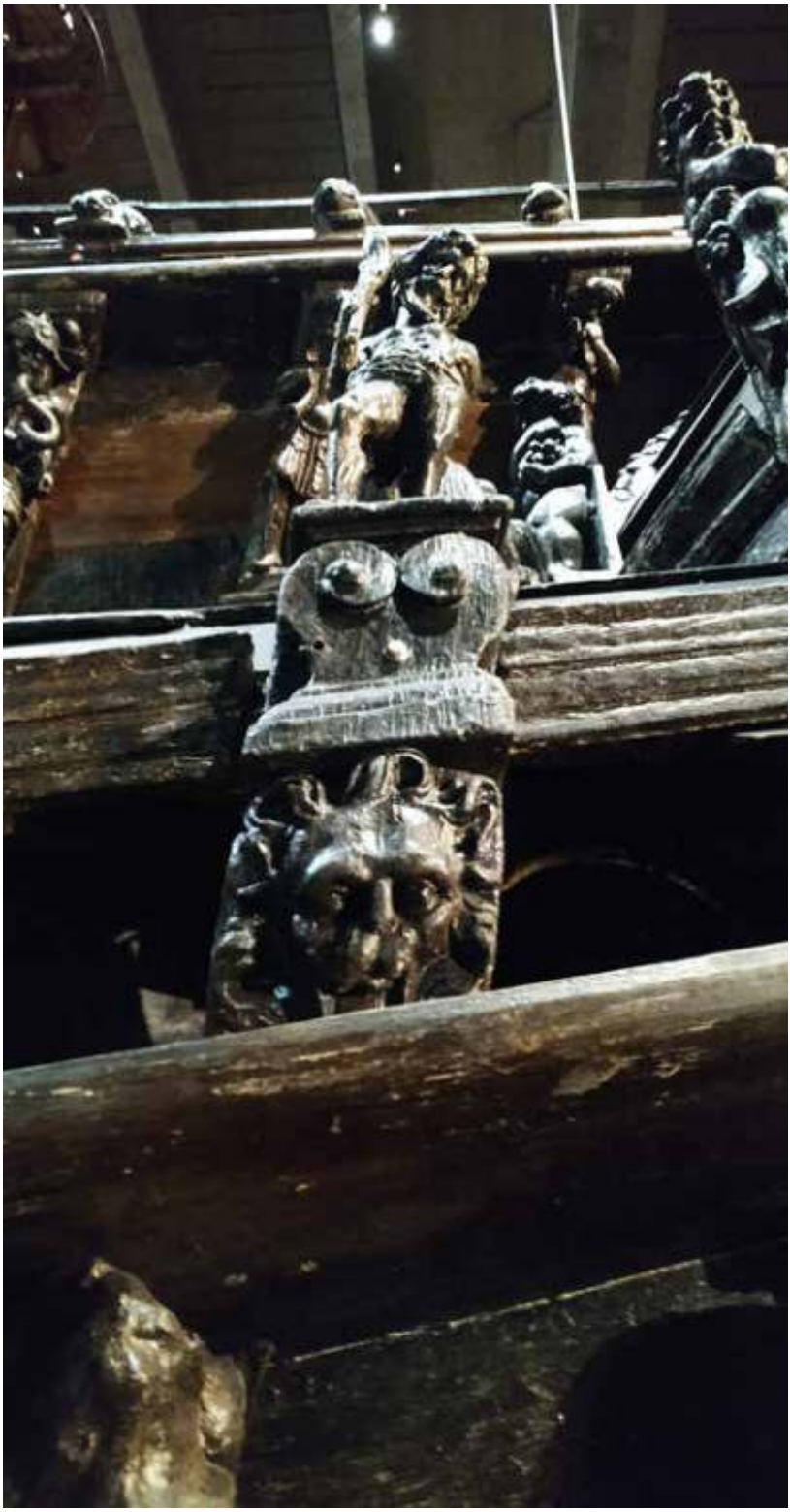
Supporting sculptures in the lower part of the stern. In the picture on the left, nails between the sculptures are visible.



Scheme of a lower section in the stern. The sculpture on the top is supported by the ones below.

Console in the lower part of the stern.

Below: detail of a nail fastening the sculpture to its support (left); sculptures on the lower gallery in the starboard side.



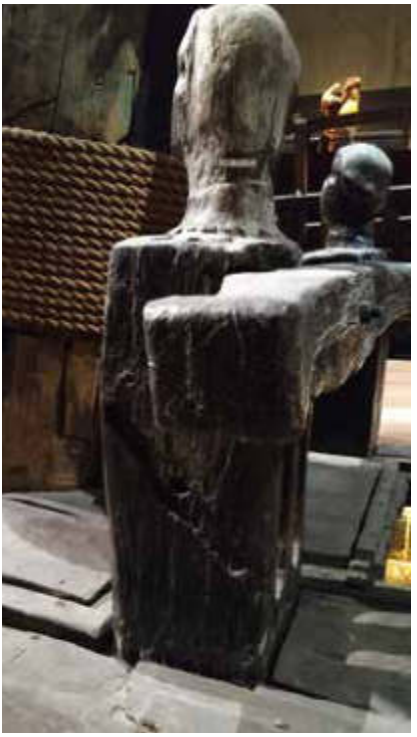
Sculptures in the quarter gallery in the starboard side.

Functional elements – These are those parts that have a precise aim for the sailing operations and some of them were sometimes carved. One is on the port side and is the support for the main sail tack carved as herm.[42] The other elements are on board are six stationary halyard blocks, on which heads of knights have been carved on, and another one on the roof of the pilot-house, which was for the mizzen-mast and was carved with a female head.[43]

Support for the main sail tack.

[42] H. SOOP, *Op. cit.*, pp.160-161.

[43] H. SOOP, *Op. cit.*, p. 28.



Stationary halyard blocks.

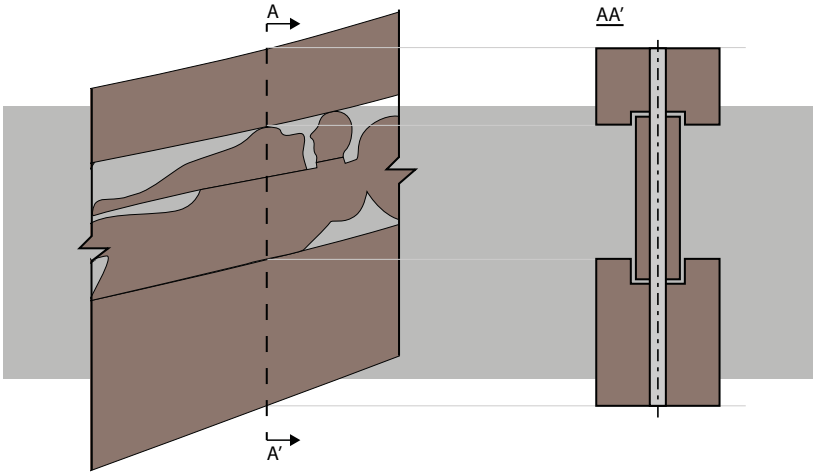
Construction process

Identifying sculptures' functions and their connection to the hull can help to understand the timing, the order, and the methodology of the construction process. Even if for some parts, it is not possible to say at what point of the construction they were fastened to the structure, it is still possible to make some reasonable considerations about some elements.

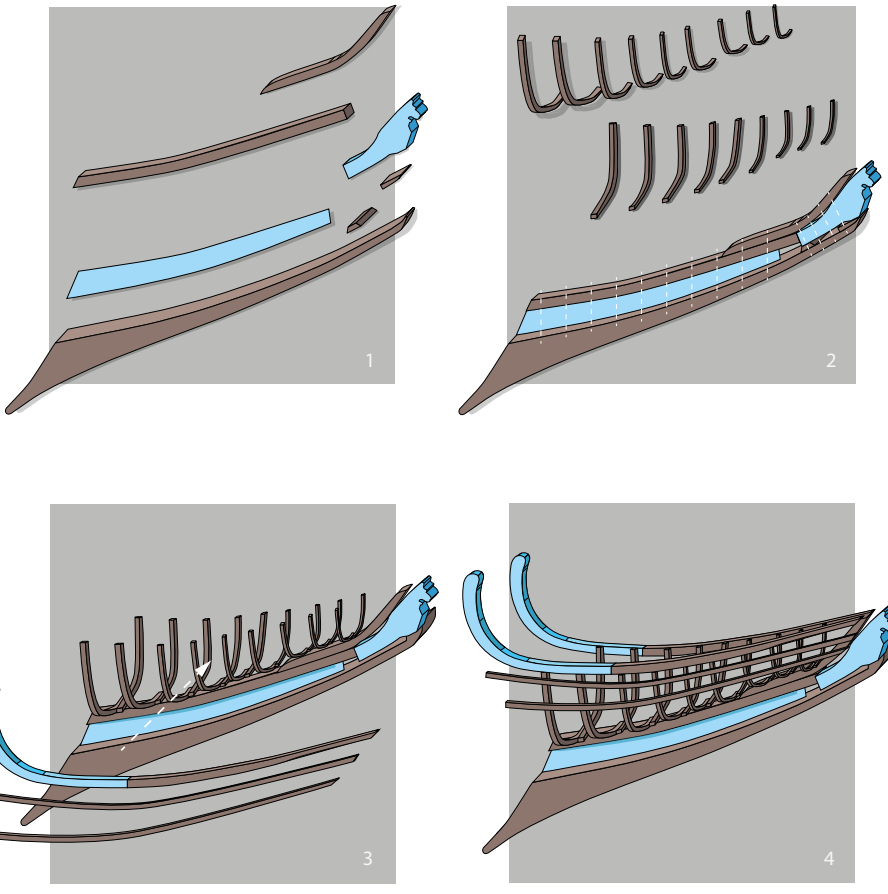
Beakhead – As aforementioned, the beakhead of *Vasa* has three decorative parts that are also structural. Considering that, it is reasonable to suppose that these parts were put in place together with the other structures and not added at the end of the construction as additional elements. The order used to place the different components for the construction of the beakhead can be estimated by looking at the joints of the structure. The first element to be put in place was probably the lower beam, directly nailed to the stem. Then, the frieze and the upper beam were placed over it. Thus, the frieze was one of the first decorations to be placed in the beakhead, and it was nailed to the two beams through long iron nails. It is not possible to affirm that the frieze could be positioned at a later time for the two beams under and over it to have a profiled section to avoid the frieze to move transversally.

As well as the frieze, the body of the lion is between the eking pieces. It was probably fastened to the lower beam before the placement of the upper one and the construction of the upper part of the beakhead. While the two tails (one on each side) and the rear legs were reasonably put in place in a second moment, as they are fastened to the eking pieces as well as to the body of the lion. Indeed, assembling the lion earlier and then fastening all its parts together to the beakhead would have been more difficult with the risk to break all those smaller and fragile components. The figurehead rested over the lower beam, and on it, a short longitudinal beam was placed as a continuation of the upper beam. The figurehead was fastened to the structure with long nails which pass through both the lower and the short upper beams.

The upper eking piece is the base of the curved beams forming the basket rest. Thinking about the transversal rails as ribs, the basket is similar to the skeleton of a hull; thus the processes of its construction could have been analogous. It is possible that before their placement, a longitudinal beam was put in place in order to give the right curved shape to the basket. After their positioning, the last structural elements of the beakhead could be nailed at the basket. There are three longitudinal rails which run from the hull to the figurehead, and they were nailed to the transversal curved beams and to the upper beam. The big triton is part of the upper rail and was probably fastened together with them. As aforementioned, it is also possible that at least one of the rails was



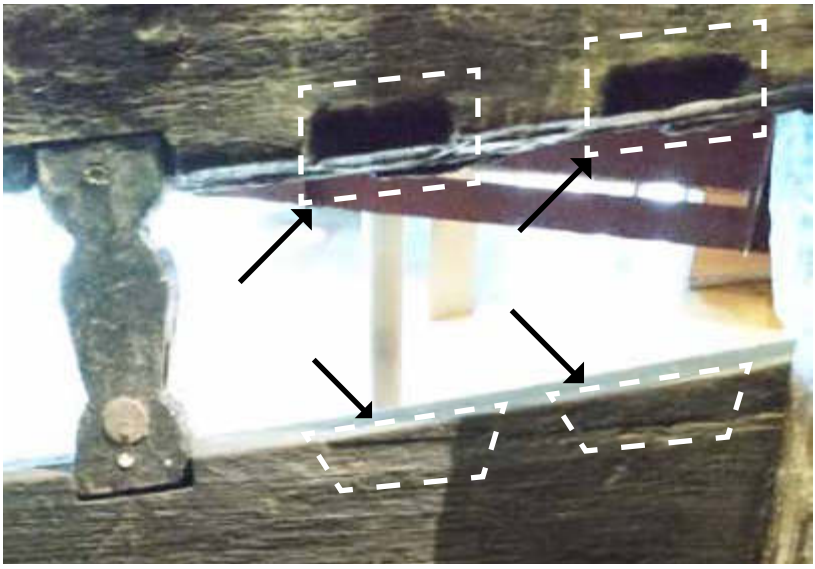
Section of the frieze, the eking pieces, and a nail.



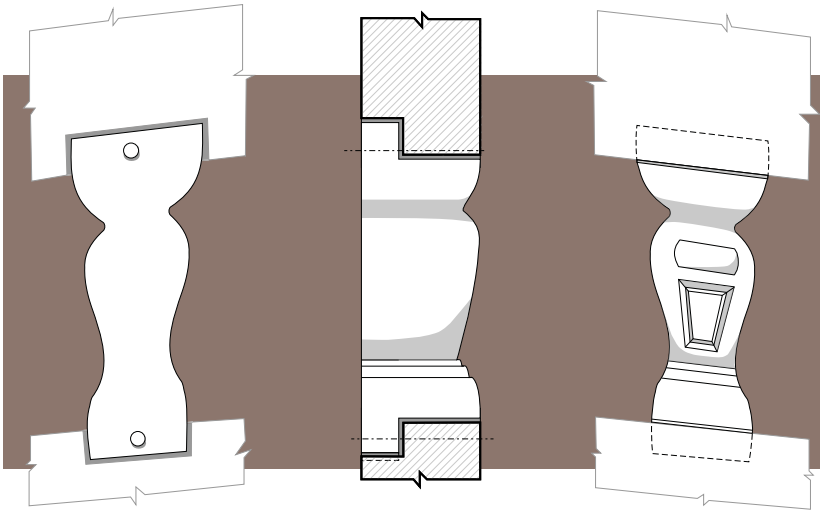
Possible order of placing of the beakhead structure.

placed before the transversal beams. At this point, the structure of the beakhead was completed and the rest of the decoration could be added.

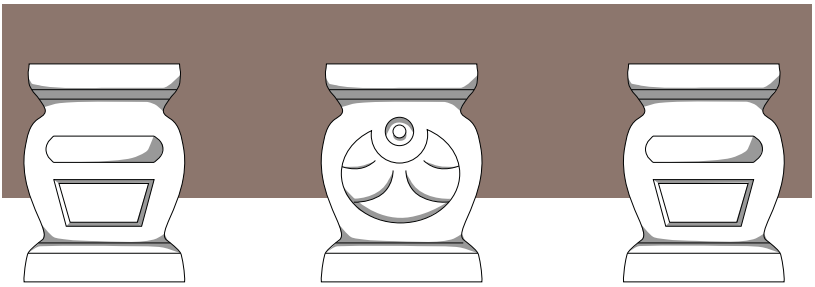
In particular, it is interesting to note that the 54 carved elements placed between the sculptures of the emperors have a specific shape in the rear part that fits the empty spaces shaped on the rails. That suggests that they were designed from the beginning of the construction and placed at a later time (they were fastened to the rails by two or more nails). Indeed, they had to decide how many holes to create and, thus, how many elements they wanted. That could be hinted also by the fact that they have different drawings carved on them; in each group of three, the external elements have the same geometrical ornaments while the middle one has a circular motif.



In this picture it is possible to see the holes made on the rails to host the ornaments.



Schematisation of how the 27 small ornaments are joint to the rails. The space between the ornament and the rails is here made larger just to let appreciate better the shape. Nowadays, there is a space due to the shrinking of the wood.

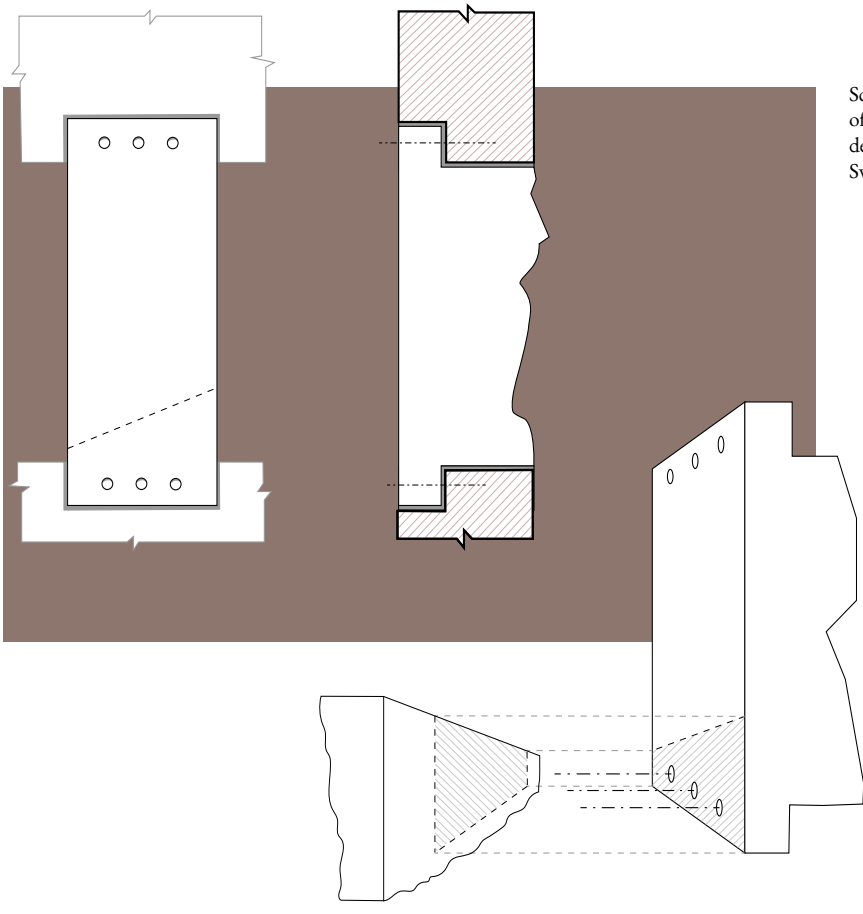


Schematisation of the different decoration common to each group of three ornaments.

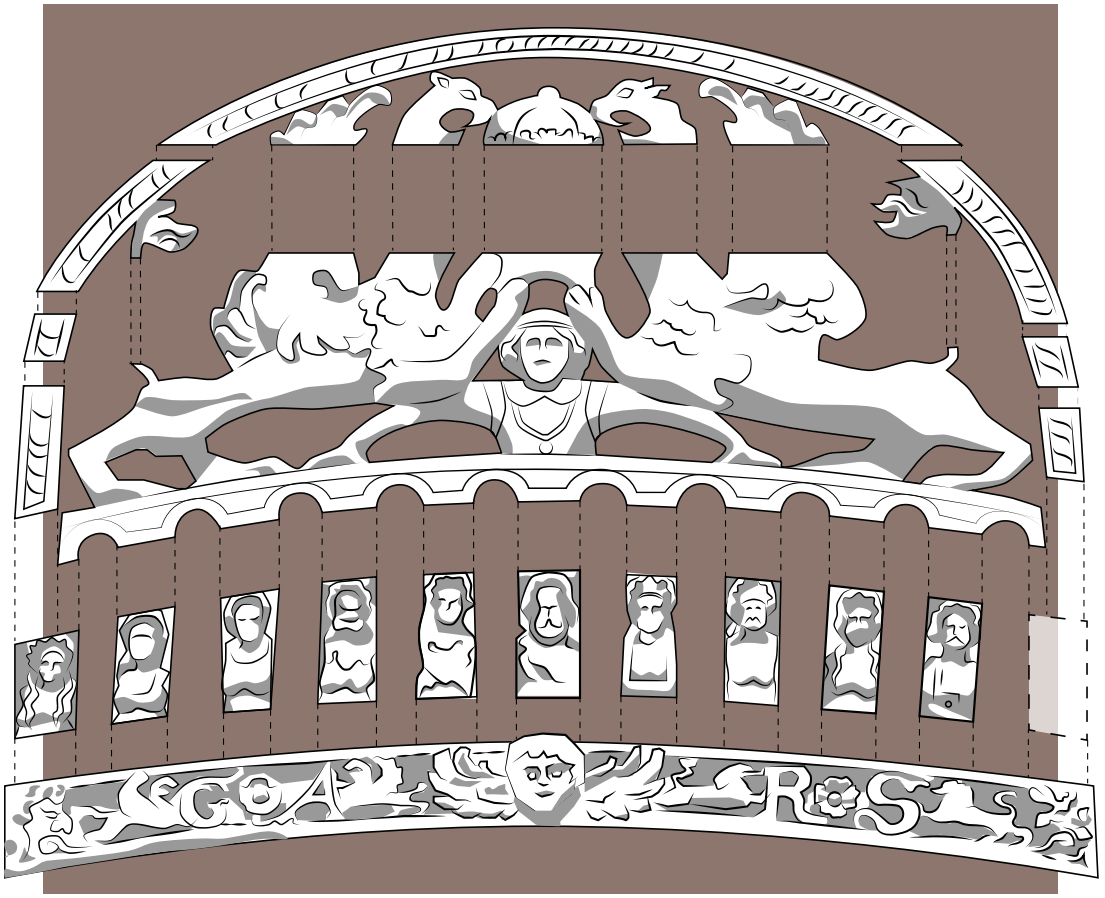
Top section of the stern decoration seen from inside the ship.

Details of the sculptures representing the Swedish people from behind.

Stern – Decoration in the stern is made up of many sculptures and has a complex structure. Nevertheless, some consideration can still be made by looking at the joints. As well as for the iconology, it is possible to identify different tiers even for the construction method. Starting from the top, the first section represented the king's right to the throne. To establish it is necessary to look at the nails and in particular from behind the sculpture, that is from inside the ship. Indeed, it is possible to understand that this section was assembled before its placing on the ship as the sculptures are fastened together by back nails which are then overlapped by the structure of the ship. That is particularly clear looking at the sculptures representing the Swedish people. The technique used is similar to that of the 54 ornaments of the beakhead. The beams on which the ornaments are fastened have holes on them with the precise shapes. Ornaments are laced in these spaces and then nailed from behind. Thus, having already attached some sculptures on the ship, it would be no possible to insert those nails.



Schematisation of the sculptures depicting the Swedish people.



Parts composing the group of sculptures in the upper section of *Vasa*'s stern.

The section is composed of three tiers. The base was a transversal large beam wich had carved the acronym "GARS" (Gustavus Adolphus Rex Sueciae),[44] and the face of the cherub is the only separated element, which is fastened to the beam by large pegs perfectly carved to be unrecognisable. Over it, the second tier is composed of eleven sculptures depicting the Swedish people; as already shown, these elements are fastened to the lower beam and to the upper section by nails placed from behind. Considering the method used, these three sections must have been joined together before being arranged on board. The upper tier is the most complex as it is composed of several parts divided horizontally. For this reason, a vertical reinforcement was probably necessary, and by looking closer it is possible to outline the original structure used for this purpose. Indeed, it is still possible to see what remains of five large vertical wooden rods that passed through all the section joining together the sculptures. Nevertheless, given the wear of the wood and the layers of PEG, some parts could be covered, and a further study could reveal the presence of other rods.

[44] A.M. Forssberg, *Op. cit.*, p. 140.

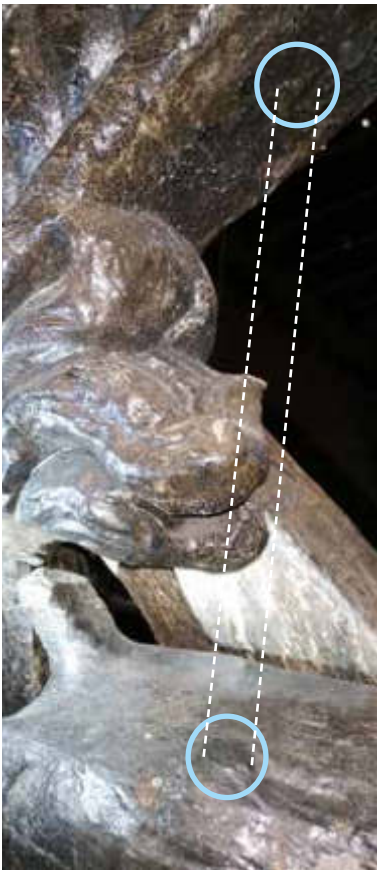
Above: the left end of the beam, from this picture it is possible to see the carvings.

On the side: face of the cherub on the horizontal beam. In the blue circle the treenails used to fasten the sculpture are enlighten.

One of the 11 sculptures placed over the beam.

Left and right: details of the support that passed through the crown and the head of the king.

Left and right: details of the rods that were positioned on the griffin at the right of the king.

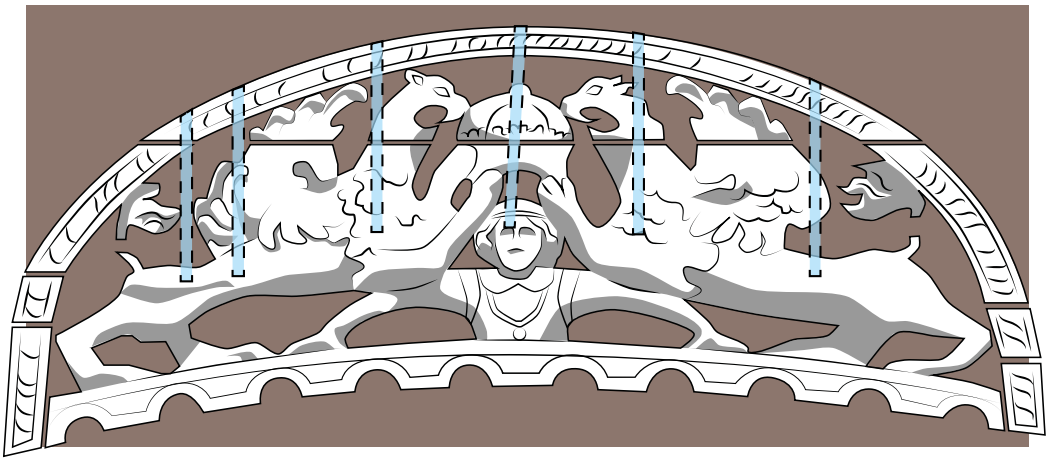


Above: pieces of the rod that passed through the king and the crown.

On the side: piece of a support in the neck of the griffin at the left of the sculpture of the king.

Piece of a rod in the body of the griffin at the left of the sculpture of the king.

The rule indicates the vertical position of the rods in the body of the griffins.



Above: drawing of the probable original position of the vertical reinforcements based on the observation made at the Vasa Museum.

On the side: one of the rods passing through the upper frame.

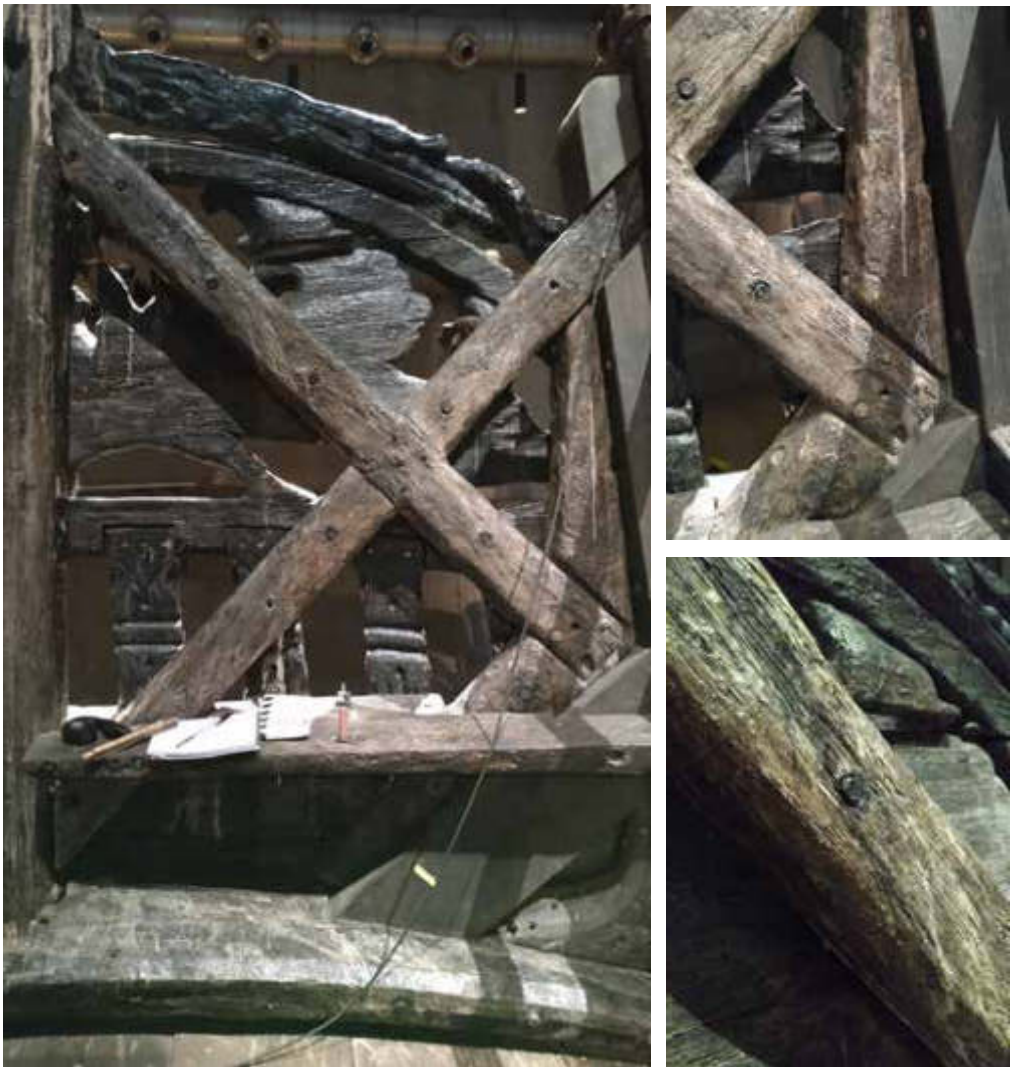
Above: upper section with the tritons in place. In blue it is possible to sEe the position of the iron nails.

On the side: triton on the starboard.

Detail of the holes for the nail of the triton on the port side.

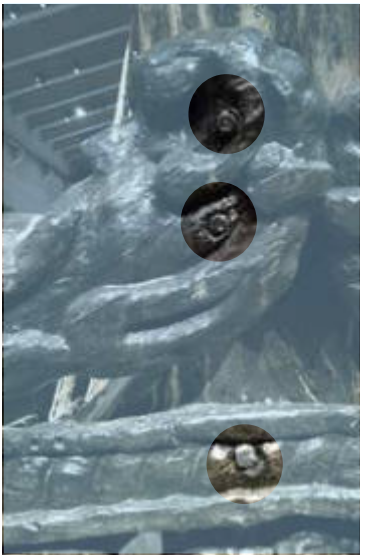
The two tritons above the upper frame are fastened to it separately. Indeed, the vertical reinforcements do not pass through them, and there are iron nails which join the tritons to the section below them.

Once the group of sculptures was assembled, it was fastened to the structure through iron nails. The structure is composed of a vertical timber in the central position, which is the largest, two vertical side timbers and, on each side, other sturdy timbers are added to reinforce the structure creating X shapes. Even if the iron nails are not original, they are placed in the same position as the original holes, and thus they can show how this section was fastened to the ship. Almost all the nails on the sculptures are placed from inside the ship and it is possible to see them only aboard. This is mainly true for the nails fastened to the timbers creating the X shape. On the contrary, in the central part, in the later frame and in the carved beam in the lower part, nails are positioned from the front side. For this reason, they are the only ones to be visible looking at the front side of sculptures.



Details of the structure and nails used to fastened the sculptures on the ship.

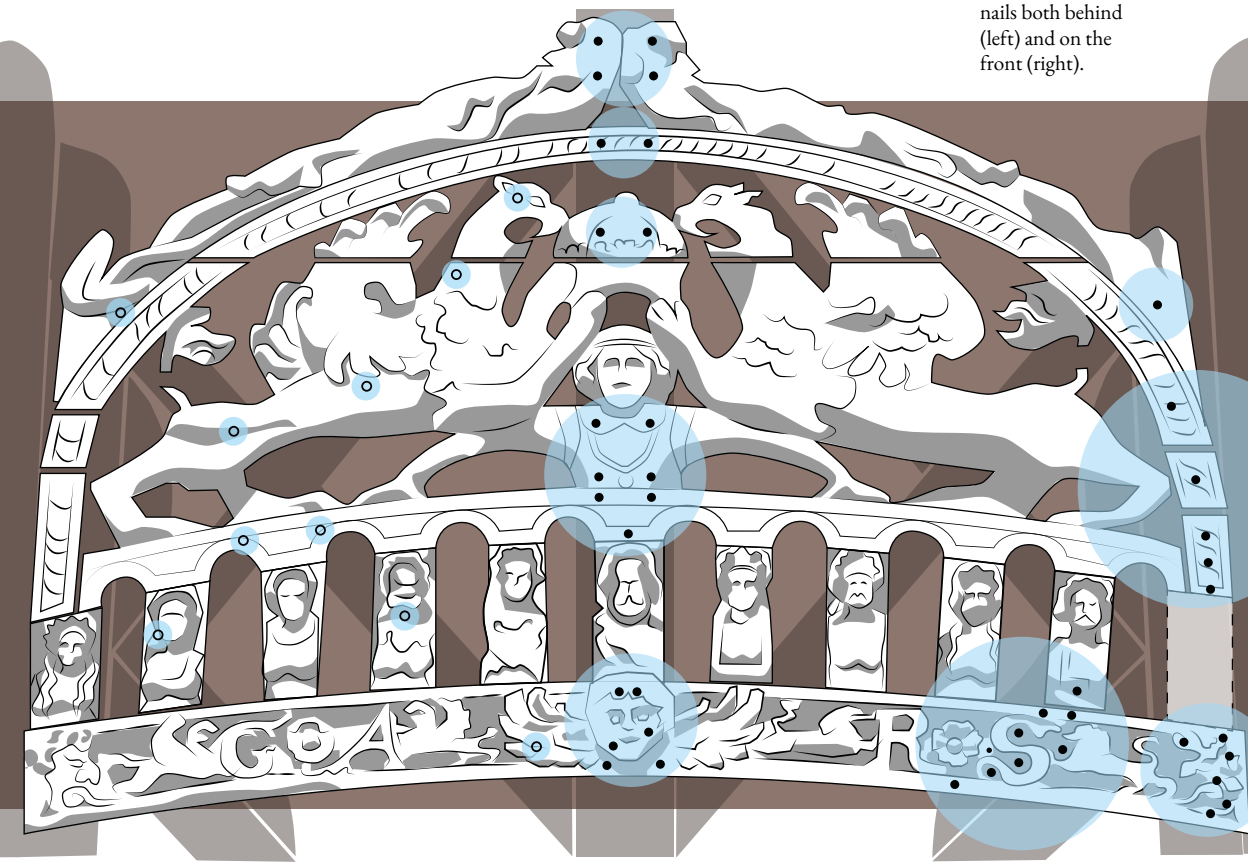
Nails fastening the tritons to the ship.



Nails fastening the crown and the king to the ship.

Detail of the some nails on the horizontal beam.

Scheme of the iron nails both behind (left) and on the front (right).



Nails in the Back

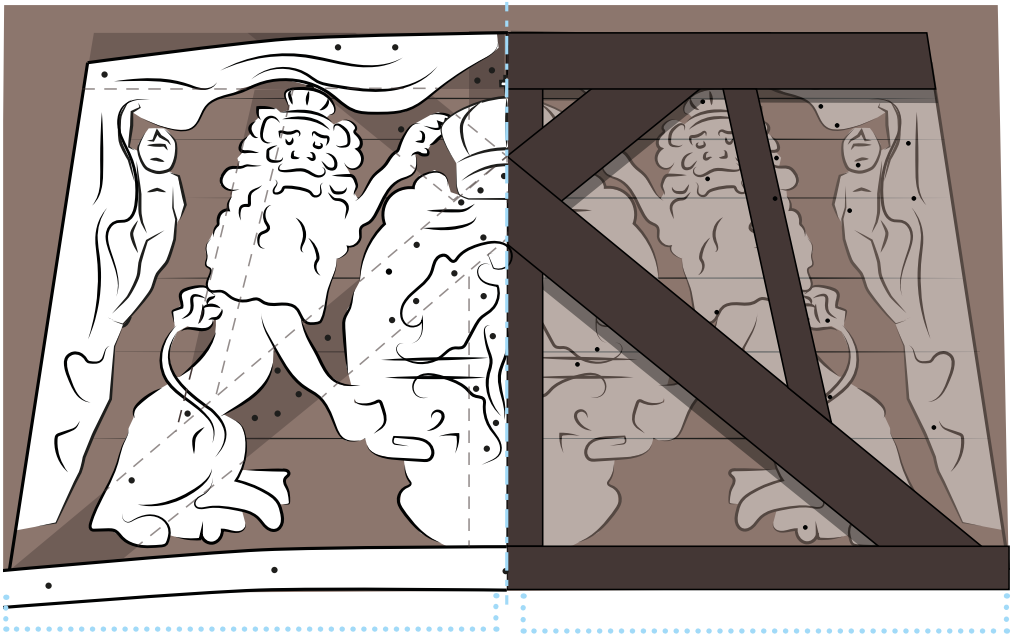
Nails in the Front

The second tier of decoration is that of Sweden's coat of arms. This group is composed of many pieces but, differently from the upper tier, their are all fastened to a common background, which is made by several transversal planks. Moreover, the small components of the central part are fastened to different boards which are joined to the planks. Considering the complexity of these connections, it is likely that the separate components were assembled on the ground and later fastened to the hull as a single piece. This means that this part is made of two layers, one is that of the sculptures and the other is made of planking. Looking from outside, many iron nails are visible both on the flat surface of the coat of

In the two pictures below: the exterior (above) and the interior (below) of the same section.

arms and on the planks in the background. Some nails are also placed in more bulky pieces, such as in the front legs of the lions. Having two layers of decoration, every nail could be either fastening the sculptures to the planking or fastening the whole group to the ship. A way to understand if the nails are joining the decoration to the hull is to compare the outside with the inside. Indeed, only the nails that penetrate the structure behind could serve this purpose. From inside the ship, the X-shaped structure is the support for this section. Since no nails are visible on it, the connection between those timbers and the sculptures must be made by the ones from the outside. Moreover, where they are not covered by the timbers, it is possible to see the nails used to join the planks to the sculptures. The fact that these nails are placed from the back side suggests that this section was assembled earlier. In trying to identify which of the external nails are those used to join the sculptures to the timbers, a graphic schematisation has been made; in this drawing, the port side half of the section has been depicted both from inside and outside, always showing the sculptures as well as the structure. After that, on the "external view", some nails have been drawn; those are some of the ones which should overlap the timbers behind. Nevertheless, not all the nails have been here identified and only further studies could generate a more complete scheme. For this reason, this drawing does not want to be a perfect schematisation of all the structural nails but just a general representation to understand the method used during the design of the section.

Scheme of some iron nails both behind (left) and on the front (right).



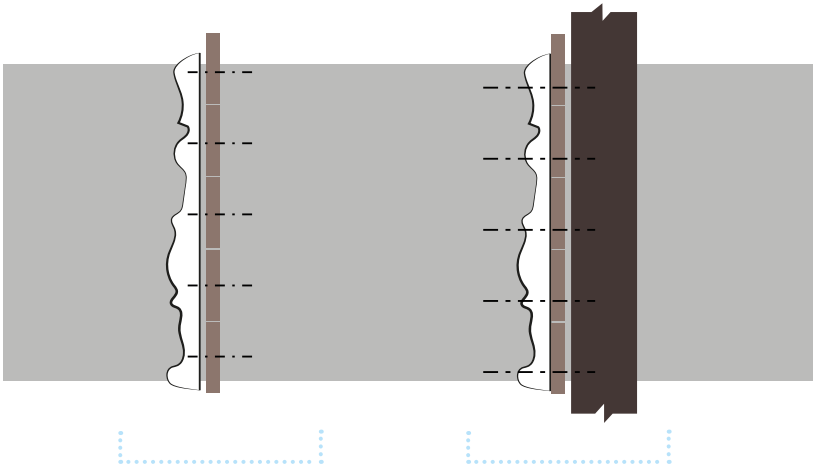
Port side half from outside

The nails depicted here are some of those visible from outside that should fasten the group of sculptures to the timbers.

Port side half seen from inside

The nails depicted here are some of those visible from inside that should fasten the planks to the sculptures outside.

The drawing shows the different ways in which nails were positioned to fasten the sculptures to the planks and the whole group to the timbers. Dimensions, shapes and position of sculptures, nails and timbers are approximate and do not represent the section precisely.



JOINTS BETWEEN SCULPTURES AND PLANKS

JOINTS BETWEEN THE GROUP AND THE TIMBERS

On the left: interior of the starboard side. In blue, some of the visible nails are highlighted.

On the right: detail of the crown over the coat of arms; above it, three nails are visible which are fastened to the planks ans likely to the timber in the back.

Tier of masks in the stern of *Vasa*.

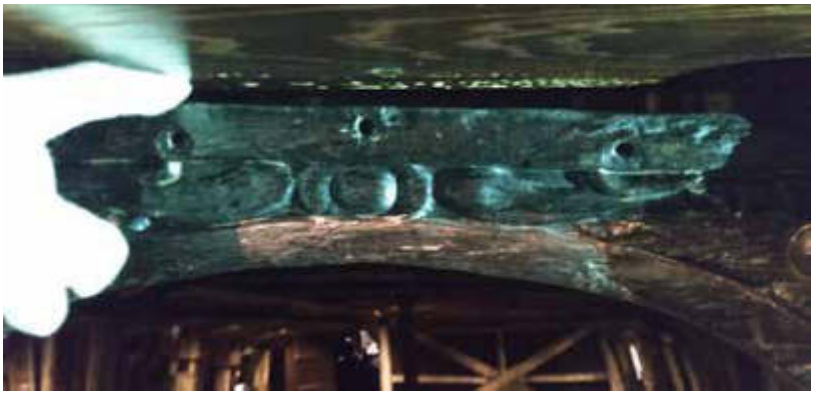
Below Sweden's coat of arms, five masks embellish the space between the openings. Each mask is mainly carved on a single wooden block, even though some parts, such as the nose, are separated elements. These decorations are nailed to a flat surface from the back side, and almost no nails are visible from the front side. Exceptions are in two masks in the corners and one in the middle; these three have nails visible from the front side. Nevertheless, they are positioned in strategic places to be hidden, such as inside the curls of the masks' hair or in their eyes. The boards on which the masks are fastened are nailed to the upper and lower horizontal timbers. Moreover, carved wooden arches connect the masks creating a continuity in the decoration. These elements are nailed to a long horizontal timber that runs through the width of the stern. At their ends, they are joined in a space between the masks and their supports. Thus, the arches had to be placed before the masks, and this could suggest that the supports were already in place when the arches were positioned and, over them, the masks were nailed to the boards.

On the left: support of mask from the rear side.

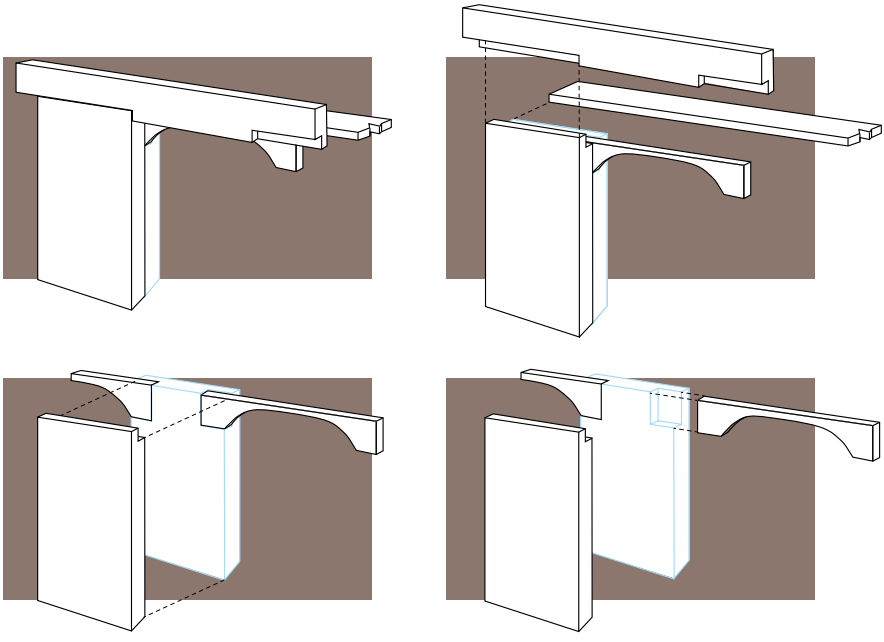
In the middle: the mask in the middle.

On the right: joint of an arch with the mask and its support.

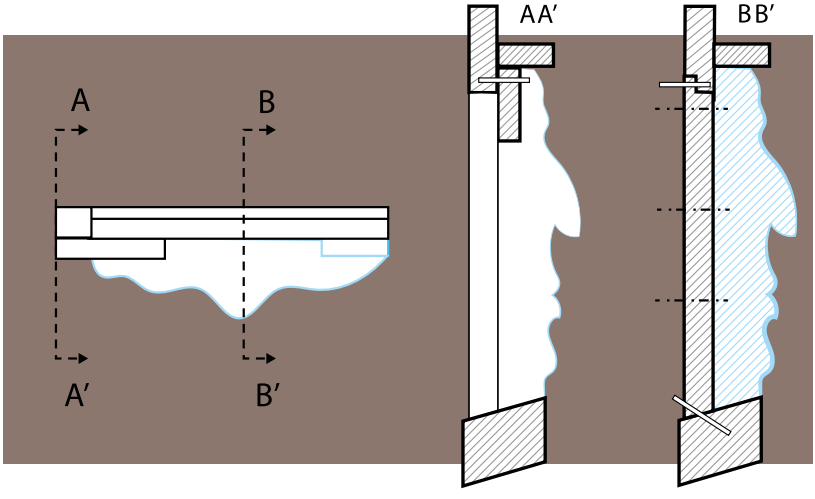
Picture of an arch were the original hole for the iron nails are clearly visible.



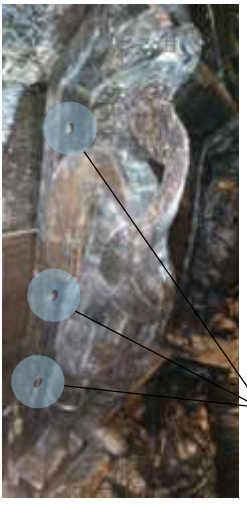
Schematisation of the main elements to show how the arches are fastened to the ship.



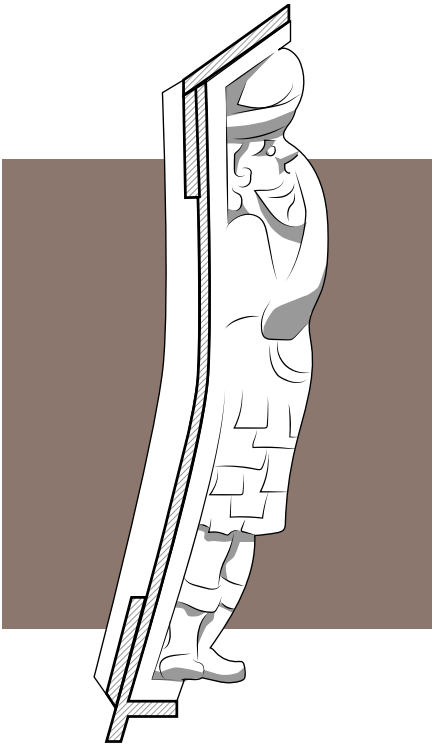
Schematic sections of a mask showing the general position of nails.



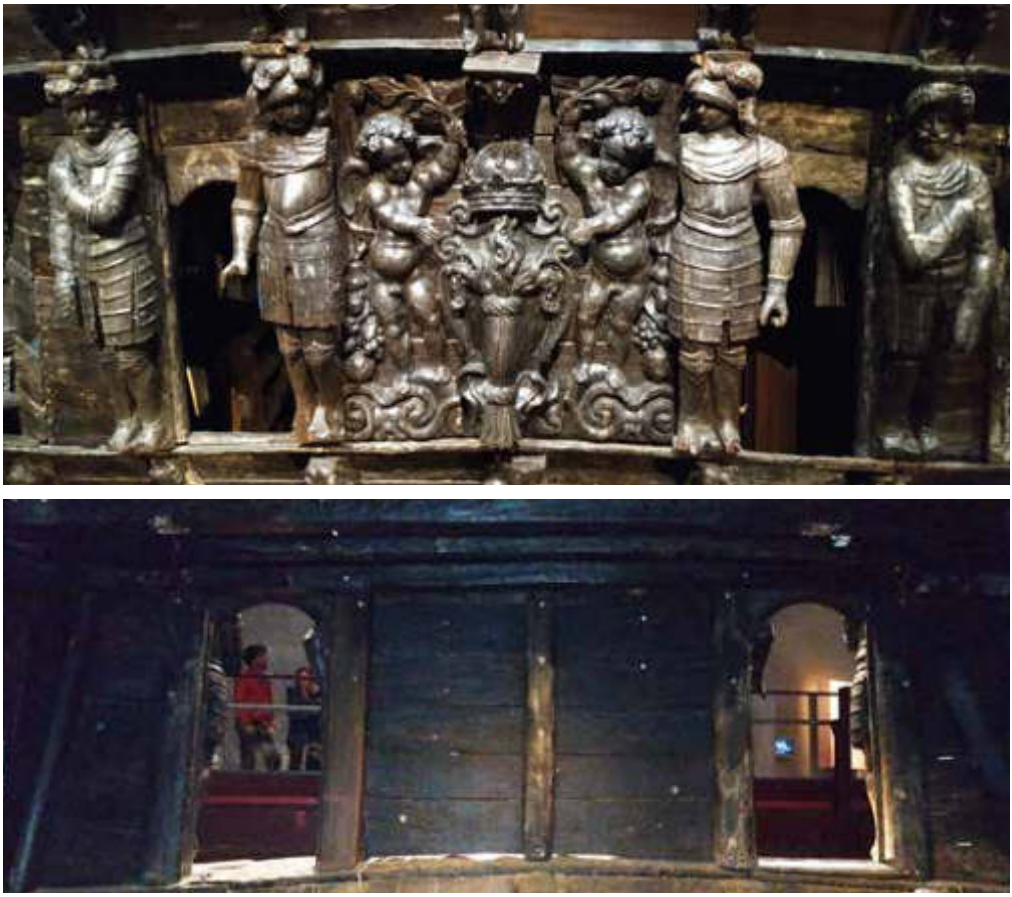
Below each mask, there is a sculpture of a man. These are Gideon and his warriors.[45] These sculptures have thick frames in their backs with a C shape and they are curved to follow the profile of the ship. The blocks are fastened to the hull by the use of iron nails positioned from the front side. Inside the ship, vertical timbers are placed behind each sculpture to support their weights.



In the three pictures: views from both inside and outside the ship in the section with the sculpture of Gideon and his warriors.



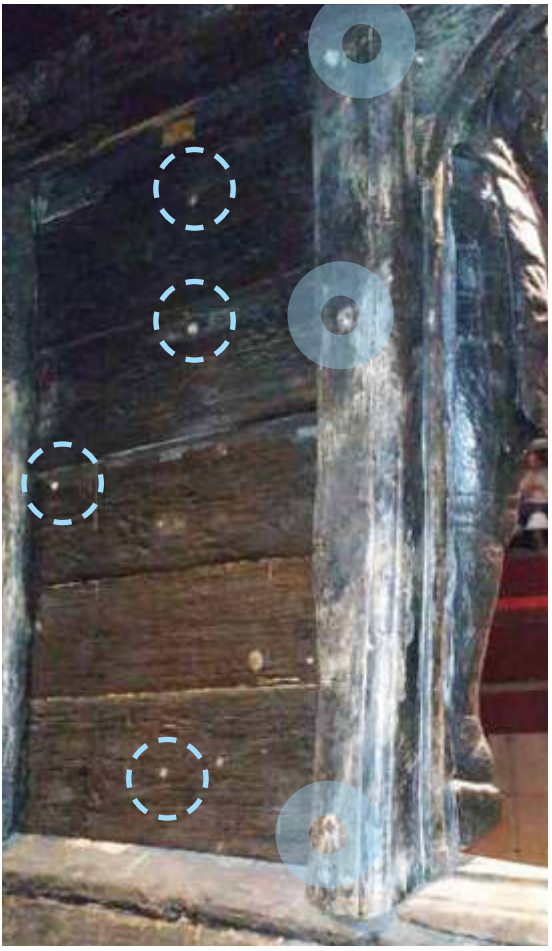
Schematisation of the main elements that take part in the support of the sculptures of Gideon and his warriors in the stern.



Section of stern decoration with the Vasa family's coat of arms and the soldiers on its sides. Views from outside (above) and inside (below) the ship.

The section with the Vasa family's coat of arms is made following methods already seen for the upper tiers. In particular, the human-size soldiers, even though larger than Gideon sculptures, are similar to them in their design. Indeed, they are individual sculptures (made of several components) that have a C-shaped frame in their back which contains also the head and the feet. Iron nails, which join the sculptures with the hull, are placed on the sides. Differently, the central part is composed of a group of sculptures that follows the same method used for Sweden's coat of arms. The numerous and small parts are assembled in a single piece by the use of a board in the back made of planks. The group was then attached to the hull as a single element.

Looking from the inside, similar to the previous section, each soldier had a vertical timber supporting its weight and transferring it onto the other timbers below. A vertical timber is also placed in the middle, corresponding to the coat of arms on the other side. Nevertheless, there are no cross-shapes to support this section. On every timber, iron nails are clearly visible, fastening the sculptures to the ship.



Above: View from inside the ship of the sculpture of a soldier and its supporting timber.

On the left: one of the warriors in the port side.

Nails used to fasten the sculptures to the planks

Nails used to fasten the sculptures to the ship

In the lowest section of *Vasa*'s stern, four tiers of sculptures are standing one on the other and thus, as previously discussed, these sculptures are acting as supports. The only exception is the middle section, where there are only two sculptures, the Hercules and the winged figure under it. For what concerns their design, they are all similar to the knights and the Golias' warriors of the upper tiers. Each tier is made of individual sculptures with sturdy C-shaped frames behind them, through which they are nailed to the hull.

Section below the coat of arms of the Vasa family seen from inside the ship. The timber in the middle of the picture is a support for the sculpture outside the hull.

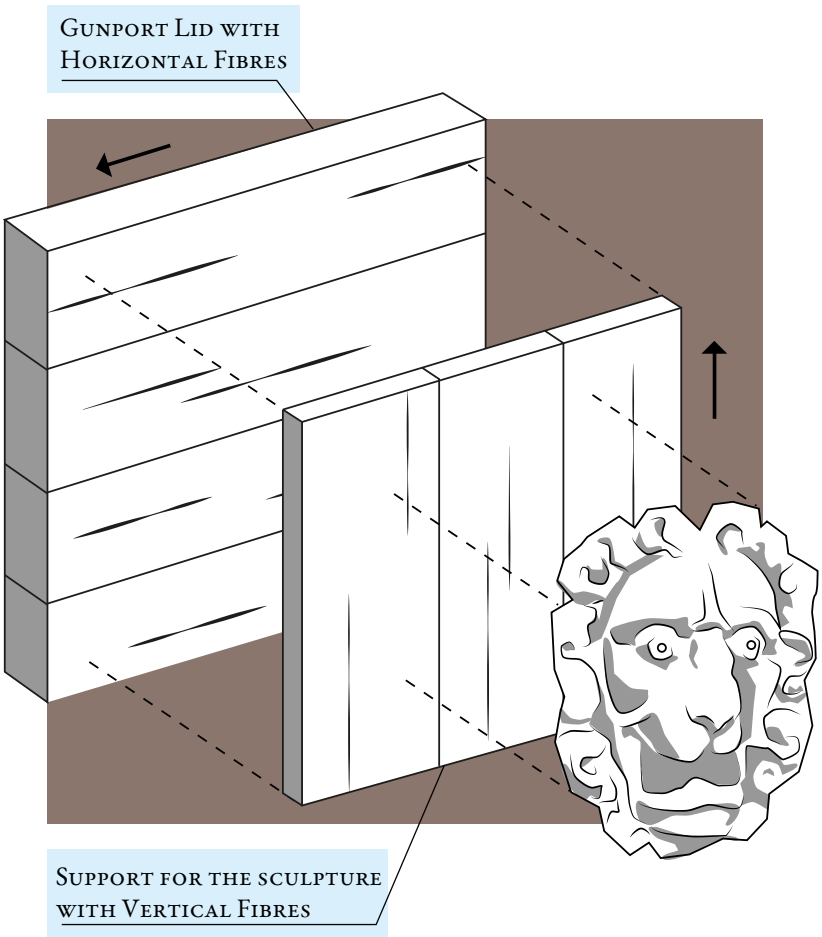
Sculptures used as supports in the lower part of stern decoration.

In the picture on the left, it is possible to see a nail coming out from the hull and piercing the support.

In the picture on the right, it is possible to see three original holes once hosting the nails fastening the sculpture to the stern. Two hole are on the timbers and one is on the residual part of the sculpture.

Section below the coat of arms of the Vasa family.

Gunport lids – For what concerns the construction process, the last part described here is the lid of squared gunports. On *Vasa*, every lid originally hosted the face of a lion. Although not lion is identical to another in terms of exterior look, they are all designed following the same method. The face is generally carved from a singular piece of wood, even though there are some lions made from two pieces. The lions are not nailed directly to the lids since there is always a flat board between them almost as large as the lids. Nails on the lions are arranged mainly in the mane, surrounding the face and even if some lions have holes in the mouths, almost no nails are visible in the central part. The lids of gunports are made by several short planks placed side by side horizontally, while the boards over them are placed at a 90° angle to those beneath; this was done to make the part stronger. Each support is fastened to a lid by the means of numerous nails placed all around the lion's face.



Schematisation of the decoration on *Vasa*'s gunport lids.

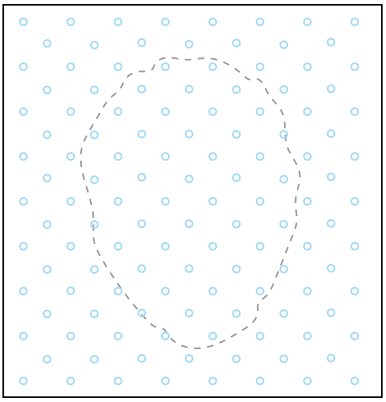
Lion face detached from the gunport lid. In the blue circle it is possible to see the holes once used to fasten the sculpture the its support.

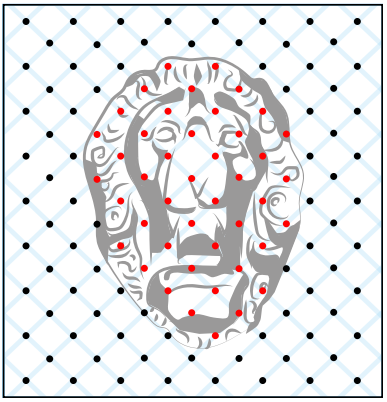
Half lion face upside down as they are seen from inside the ship.

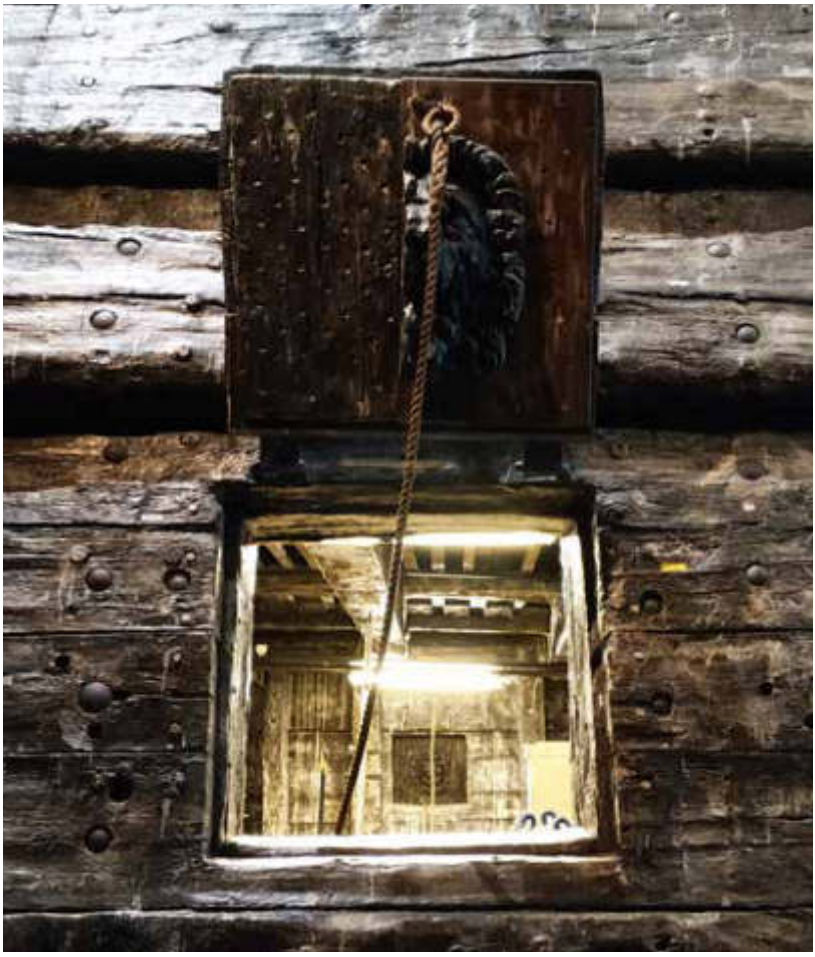
Looking at those lids which no longer have lions on them, it is possible to see the holes of nails on the whole surface. The holes are not arranged randomly; they are organized in a sort of orthogonal grid which creates a background pattern for the lions. Except for the aesthetic effect, this arrangement suggests something about the timing during the construction. Indeed, no lion has so many nail holes on their face, and thus it is likely that the supports were first nailed to the lids, and only later were the lions fastened to them. Moreover, no nails are visible on the back of the lids (with "back" meaning the side visible when the lid is closed) except for the ones used to attach the hinges. Thus, sculptures and their support were probably all nailed from the front side.

Two gunport lids with no sculptures on them.

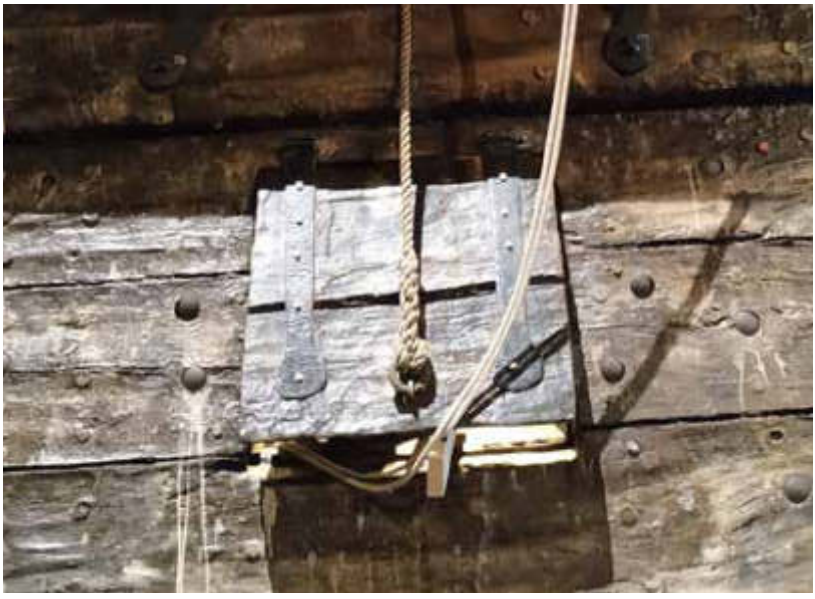
General disposition of the holes in a gunport lids and the holes which should be covered by a lion face.







Gunport lid opened with half face of a lion. On the half without the sculpture it is possible to see the nails' holes. Inside the ship, through the gunport, another lion in a closed gunport is visible.



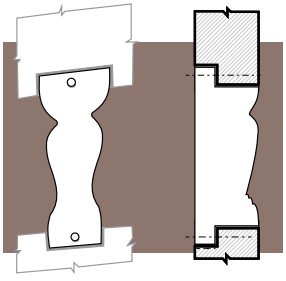
A closed gunport lid. No nails or holes are visible on them, expect for the one fastening the iron hinges.

Design of the sculptures: how they were made

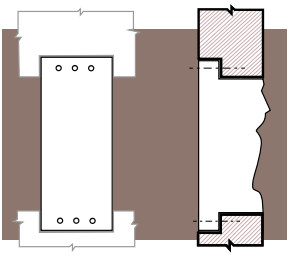
The great decoration complex is made of groups of sculptures that together create the whole. These groups of sculptures are linked by an iconographic meaning and in some cases, they are also assembled together in a physical way. This is in particular the case of the two coats of arms in the stern of the ship, which are individual subjects, such as an angel or a lion, that are connected by a common background, becoming a whole group. As already said, these two groups have in common the same method of construction even though the iconology and dimensions are different. Going more in detail, it is possible to see that there are many similarities also between the single sculptures in the way there were made. Indeed, there are some schemes or design methods which are repeated throughout the decoration of *Vasa*.

"T" shape – One of the common designs that can be seen in the decoration of *Vasa* is a sort of "T" shape arranged horizontally. This shape is common to the small ornaments composing the balustrades in the beakhead, to the Swedish people in the first section of the stern, as well as to the masks in between the openings of the stern if considered as a single part with their supports. By using this configuration, the ornate part is always in the middle, having two projecting parts above and below, which are the ones nailed to the structure. The sculptures having this design are characterized by a rectangular shape in which the vertical length is larger than the width and they are generally connecting two horizontal timbers, where the nails are fastened. This kind of shape allows having nails only in the rear part of the sculpture and reduces, if not completely removes, the presence of holes in the front side.

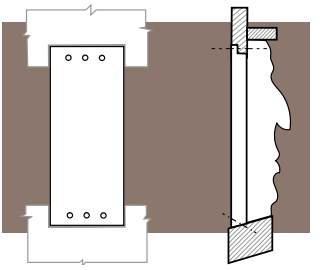
Schemes of different sculptures on *Vasa* having a "T" shape design.



ORNAMENTS IN THE BEAKHEAD

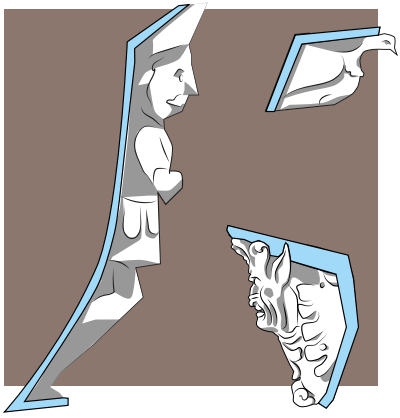


SCULPTURE FROM THE SWEDISH PEOPLE GROUP



MASCARON AND ITS SUPPORT

Frames – Many of the sculptures have a C- or L-shaped base behind them. This frame is not a separate section and is part of the same piece of wood as the main body of the sculpture. The "C" profile is mainly used for human-shaped sculptures, such as the Roman emperors in the beakhead, or Gideon's warriors in the stern. It is also used for sculptures with an animal aspect or grotesque masks in the consoles even though with these subjects the "L" profile is more common. Tritons and mermaids on the roofs of galleries in the quarterdeck have the same design. The extremities of the frame enclose the top and the inferior parts of the sculptures, such as the head and the feet of soldiers, creating a skeleton which reinforces the structure. Generally, the frame hosts the nails used to fasten the sculpture to the hull, avoiding holes in the carved part. It is also interesting to note that the frame perfectly follows the curvy surfaces of the ship and, in the galleries, the frames have steps in their backs which align with the overlapping planks of the roofs.



Schemes of different profiles of the frames behind sculptures.

On the left: one of the soldiers beside the Vasa family's coat of arms.

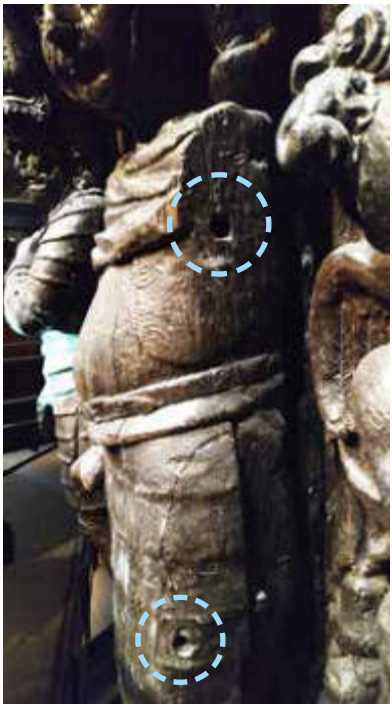
On the right: a triton and a console on the roof of the lower gallery in the port side of *Vasa*.

Different parts for a single sculpture – Another aspect that almost all of *Vasa*'s sculptures have in common, is the fact that a single sculpture, such as a cherub, is made of different parts assembled together. In trying to define the conjunctions between the elements, two different methods can be identified and defined as "by parts" or "by layers". The assembly by parts means that a part of the sculpture, as could be an arm of a knight, is nailed to the main body. The assembly by layers means that a layer of wood is nailed over another one. Generally, the assembly by parts is used to add complex and projecting parts which have a small dimension, while the addition of layers is linked more to the thickness of the single part. Indeed, a single layer of wood is always about 15/20 cm thick and every element that exceeds this dimension is added by another layer. That means that there is a different number of layers depending on the total thickness of the sculpture. It is possible to see this kind of assembly in the belly of the angels caring the coat of arms of the royal family, in the noses of the grotesque figures and also in the heads of the two lions holding the royal arms in the middle tier. Nevertheless, it is not always possible to define what kind of conjunction a section is for there are pieces that could be described either as "layer" or "part". For this reason, these two distinctions are just a general definition but should not be considered a strict condition to divide the conjunctions. Moreover, both solutions allow having more projecting and three-dimensional sculptures, improving the sense of reality, and also to be free from the dimension of the wooden plank they were made of. Furthermore, this solution has also benefits from an aesthetic point of view, considering that this kind of addition is barely perceived from someone facing the sculpture from a certain distance.

Below on the left: a knight beside the royal coat of arm. The edge between the body and the left arm is clearly visible.

Below on the right: two picture of the lion holding the Sweden's coat of arms. The leg of the lion is made in a separate layer.

Moving closer to a sculpture, the single components are often recognizable thanks to the boundaries still visible, even though the layers of PEG are sometimes hiding this division. Also, the absence of an element is a clear hint of its original presence, showing either the holes or the original pegs joining the two parts.



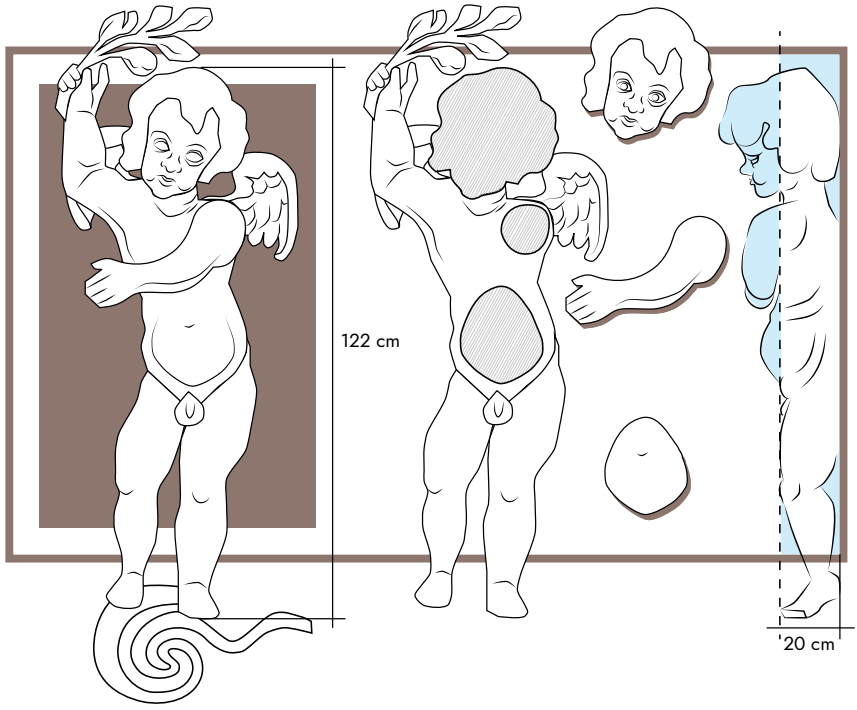
On the left: foot of a knight beside the royal coat of arms. The tip of the foot is missing but the projecting peg that once fastened it is still in place.

On the right: body of a knight beside the royal coat of arms. The flat surface on its side and the two holes prove the original presence of a missing part.

On the left: one of the masks in the stern of *Vasa*. The flat surface in the middle of the face shows the original presence of another portion nose.

On the right: a Gideon's warrior on the lower part of the stern. The peg that once fastened its right arm is still in place.

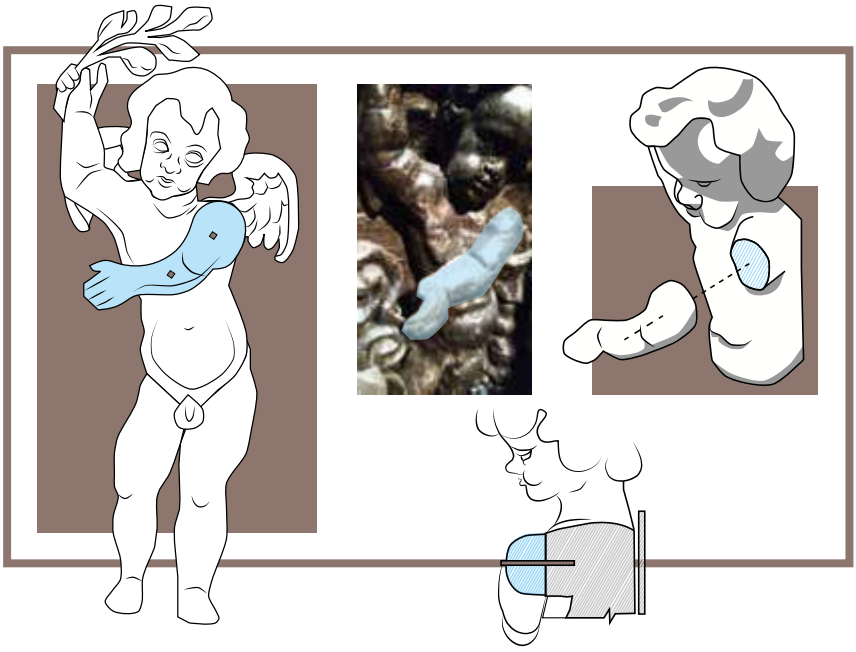
The two cherubs holding the royal coat of arms are a perfect example to understand how complex a single sculpture can be. Taking as a case study the cherub on the starboard side, it is possible to see that three parts are actually carved from separate wooden pieces. These three parts are the head, the left arm, and the belly. The reason for this design choice is clear by looking at the sculpture from the side.



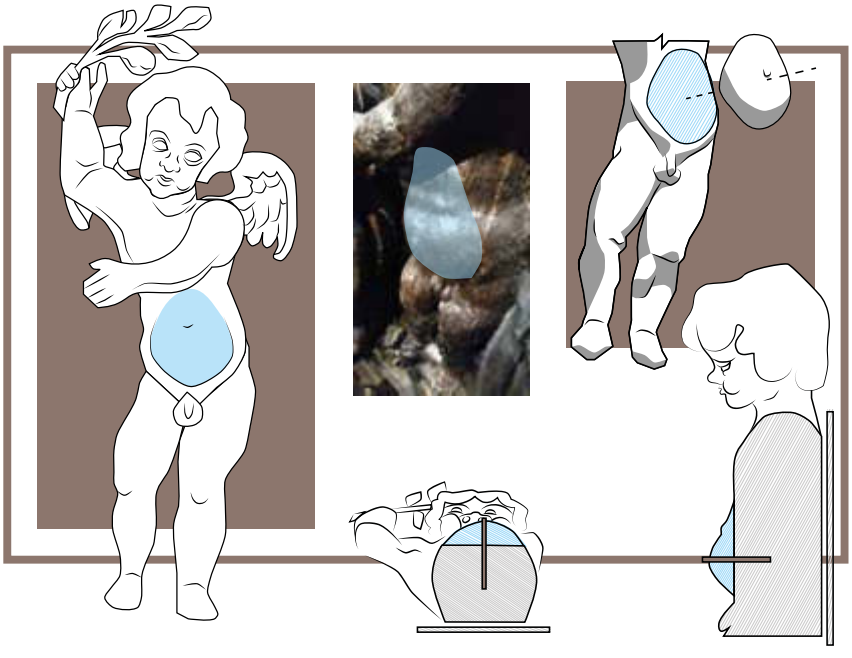
Schematisation of the cherub holding the royal coat of arms and all its components.

Schematisation of how the head of the cherub is fastened to the sculpture.

Indeed, these are the only sections which exceed the thickness of 20 cm. As already mentioned, the requirement to make the sculpture more three-dimensional was probably one of the main reasons for adding layers or parts. Moreover, all the components overlapped frontally, reducing the aesthetic impact. The pegs used were perfectly carved with the sculpture in a way to be not visible.

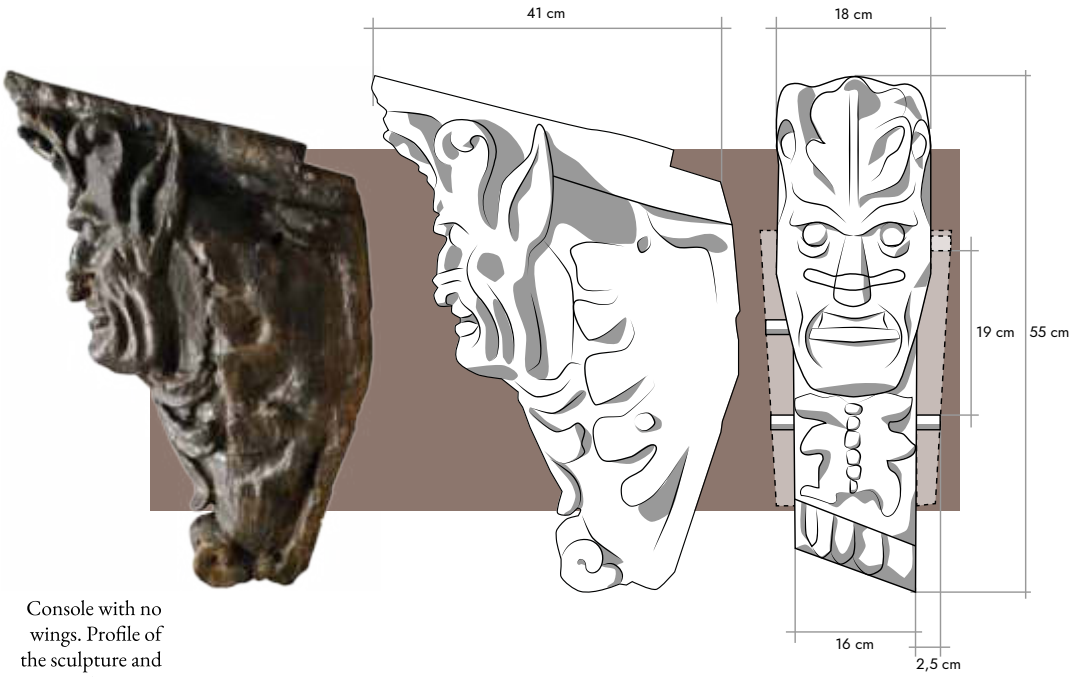


Schematisation of how the left arm of the cherub is fastened to the sculpture.



Schematisation of how the belly of the cherub is fastened to the sculpture.

A similar design was used in many of the sculptures inside and outside the ship to add both small and large parts. The consoles with grotesque faces had some elements not carved from the main piece of wood. Some of these consoles, which were once beneath the galleries, are preserved in the magazines of the Vasa Museum. Not being fastened to ship any longer, they allow a deep study and a comparison between the same kind of sculpture with and without the added components. They were made of three parts, the head in the middle and two wings fastened to both sides of the head. The middle section is the largest one, and it is about 50-60 cm high and 15-20 cm wide. Nails connecting the console with the ship were placed on it, in the upper and in the lower section, inclined in order to pass through the head and reach the timbers of the hull. The holes of these nails are still visible.



Console with no wings. Profile of the sculpture and its drawings.

The lateral wings are thicker in their upper part (nearly ten centimetres) and thinner in the lower section (about five centimetres). They were fastened by the means of two or three large pegs of about 1,5 cm and looking at the ones still inside the wings, it looks like they have a square section. Differently, the pegs projecting outside the head have a circular shape; this could be a consequence of the wear. Moreover, in one of the wings, there is also a small circular peg, having a diameter of 0,5 cm. In the heads without the wings, some of the pegs are still in their place and they are projecting 2,5 cm. Even though it is not possible to know if there were longer than this, that was probably the minimum length.

Console with wings, profile view.

On the left: console with wings. The holes for the nails fastening the sculpture to the ship are still visible.

On the right: detail of the right wing. In a crack, a small peg is visible.

Detail of the lateral side of a console without wings. A part of an original peg is still visible.

Detail of a peg projecting outside a console with no wing.

On the left: detail of the lateral side of a console with wings. A peg is projecting outside the wing as a consequence of the shrink of wood.

On the right: detail of a well-preserved peg having a square section.

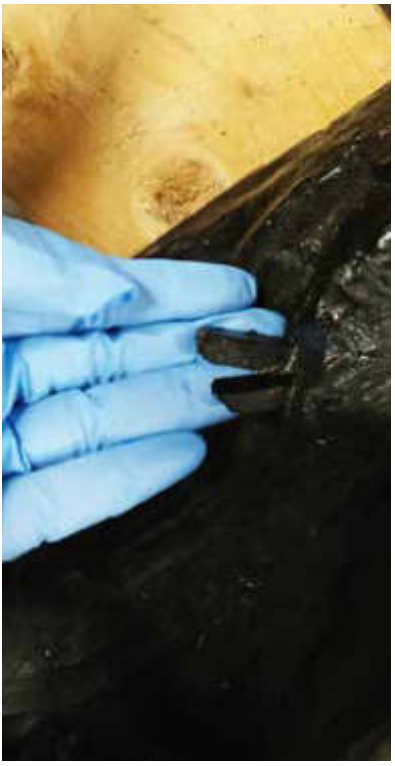
Another group of sculptures preserved in the magazine of the museum is the orchestra. It is composed of seven putti playing different instruments originally placed at the entrance of the steerage room.[46] Although these sculptures seem each carved by a single piece of wood, a closer look reveals the presence of different pegs with a diameter of about 5 mm, proving the assembly of different components. Taking the putto playing a *viola da gamba* (forefather of the cello) as an example, a study of this sculpture has shown that the instrument was carved from a separate part. That allowed to have a large empty space behind the instrument, creating a perfect effect of reality. Two pegs are still visible on the right side, showing the place where the other arm with the bow was placed.

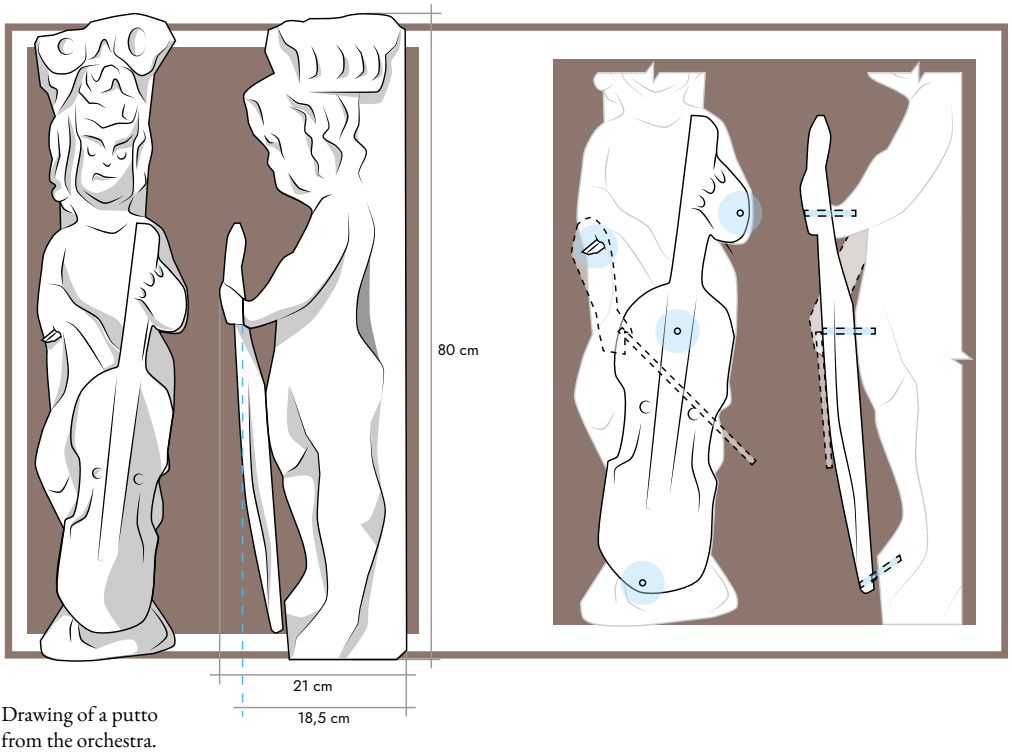
On the left: putto with a *viola da gamba*.

On the right: nail connecting the lower part of the instrument with the putto's body.

On the left: nail connecting the lower part of the instrument with the putto's body.

On the right: two nails coming outside from the sculpture's body where there was originally the right arm.





Drawing of a putto from the orchestra.

On the right: detail of the peg fastening the left hand of the putto with the body.

Sculptures aboard *Vasa* show a clear resemblance to the decoration of architectural, religious and public objects made in Sweden. This connection concerned not only the looks of the sculptures but also the artist. One of the main artists who worked on the creation of the sculptures on board the vessel, Mårten Redtmer (c. 1575 –1655), was also one of the most prolific sculptors active in Stockholm, who made, in the same style, the decorations of various and important organs of the churches.[47] The coherence between the wooden sculpture techniques used for the creation of "traditional" works, such as a statue for a church, and those present on board ships can still be seen today, thanks to the finds that have come down to us. Using *Vasa* as a case study, it is possible to compare the artistic technique used on the vessel with the one used in the Swedish territory for the creation of some religious-themed sculptures in the Historical Museum of Stockholm. The comparison highlights a strong similarity with wooden works even from the medieval period, proving how, although the stylistic rendering and the aesthetic taste had changed, the technique used by artists to create wooden sculptures remained well anchored to the artisan tradition.

Madonna from Lojsta Church, Gotland, 1325-1350, Historiska Museet, Stockholm.

[47] J. ERIKSSON, "Vasa's visual world", in A.M. Forssberg (Ed.), *Vasa's Sculptures. A Story of Power, Stockholm*, The Vasa Museum-Swedish National Maritime and Transport Musuems, 2020, pp. 27-42.

One of the lion from the *Vasa*'s stern decoration.

Madonna from Viklau Church, Gotland, c. 1175, Historiska Museet, Stockholm.

It is also interesting to compare the sculptures from *Vasa* to the decoration of other ships of the 17th century from other parts of Europe. In particular, it is possible to compare the sculptures of Sweden's coat of arms to the same section of the stern decoration of the English flagship *Royal Charles*, preserved at the Rijksmuseum.

From a general point of view, the two groups of sculptures are similar in what concerns the subject and main elements. The English stern decoration represents the royal coat of arms of England (1660 to 1689) used by King Charles II and *Vasa* has the Swedish ones. The arrangement is almost the same, the central part hosts the coat of arms supported by two large figures on the two sides. These are two lions for *Vasa*, while the *Royal Charles*' stern has a lion and a unicorn. Moreover, the animals are portrayed in almost the same way; the front legs are holding the coat of arms, having the leg in the background raised up and the one in the foreground down, and the rear legs are opened, one a little behind the other. Even comparing the lions some similarities can be found. Indeed, they have clearly visible ribs, curvy manes, and round ears. The main difference is probably in the expression since the English lion is not roaring.

Stern decoration of *Vasa*.

Despite the similarities, the two groups of stern decoration are definitely different in what concerns the design. As already said, on *Vasa,* this section is composed of different sculptures joined together in a common flat background made of several planks. The single sculptures are made of several overlapping parts so that it is almost impossible for the viewer to notice them, and this design allows projecting parts with a remarkably empty space behind them. The effect is that of a high-relief and actually, as previously shown, the technique used was the same as a wooden sculpture in the round. The English stern decoration is made as well by different parts nailed to a wooden flat background but with a significant difference. There are no individual sculptures made of different components; the group is composed of vertical planks of wood put side by side The result is more similar to the bas-reliefs carved on panels than a three-dimensional sculpture. Carving the section from a single piece of wood does not allow the exceeding of large spaces between the elements, which would create shadows increasing the three-dimensional effect. Furthermore, the lines of demarcation between the planks are clearly visible to the viewer and on the whole, the outcome is more flat and unreal.

Stern decoration of *Royal Charles.*

Thus, comparing the two stern groups, the Swedish technique had more realistic results. Nevertheless, having many small parts assembled together was probably making the whole decoration more fragile; looking at the stern of *Vasa*, the tips of feet, which were separate elements, are missing in many of the human-shaped sculptures. Projecting elements could be more easily hit by guns shots causing more damage to the hull and dangerous wood splinters. This technique could also require more time for the creation of sculptures and it is also likely to suppose that the cost for this kind of decoration was higher. Taking these possible "side effects" into consideration, it could be thought that the Swedish naval sculpture design rapidly conformed to the English technique. Nevertheless, a precious find could easily negate this.

The Maritime Museum of Stockholm hosts an equestrian sculpture of king Karl XI which was part of the stern decoration of the 82-gun *Carolus* XI (1678) built in Stockholm. Launched fifty years after *Vasa*, this sculpture still shows the same design. Indeed, the sculpture is made with many components, such as the leg of the king or the head of the horse, which are fastened to the main body through pegs. Something is different from *Vasa*. For example, different parts are also placed side by side, making some lines clearly visible, such as in the neck of the horse. But it should be also noted that this sculpture is essentially a full-relief of large dimension which probably make it not possible to use only frontal overlapping. Nevertheless, the general technique is the same and this proves that Swedish artists continued to create their artworks following the same technique at least for the whole 17th century, showing as well not to be easily influenced by foreign methods.

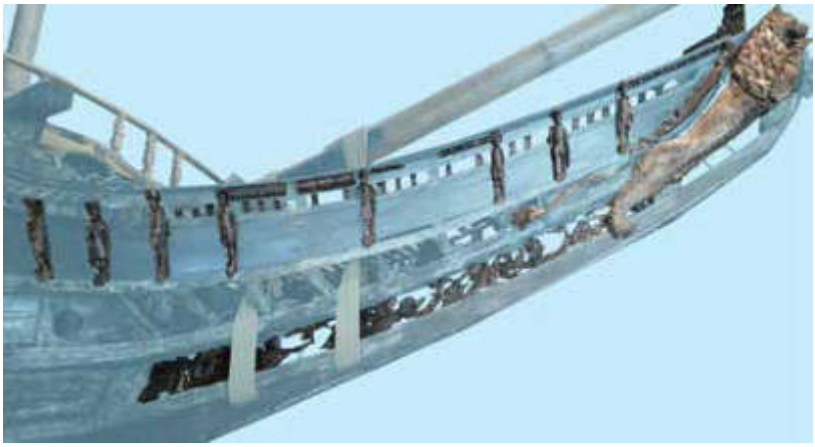
Main decoration on the stern of the Swedish *Carlus XI.*

In the next page: details of the sculpture.

3. Analysis of Vasa's decoration

Each ship decoration had its individual identity as well as some aspects which were common to the others and that remained during the evolution of the design of warships decoration during the 17th century. Looking at naval iconography, it is possible to see that all the ornaments aboard were thought of as a single decoration programme. Even if there could be different themes used, and sculptures were made by different artists, the final result was a good combination of elements which all have the same artistic style and common messages, creating a sense of unity; that was the ship's identity. The products of marine art show the whole ships and their decoration. The image of a single ship can be compared to others and that allows recognizing those aspects which were common to more ships, for example from the same state, and those which were not. In the present work, the same operation had been previously made with the aim to identify those aspects and subjects common to different states, in particular England, France and the Dutch Republic.

Thanks to *Vasa*, it is possible to compare iconography with a real example. The ship has been used to understand how the decoration was actually made and thus *Vasa* has taught something about what is shown in iconography. This operation can be also made in the opposite direction, and that is, trying to understand something more about *Vasa*'s decoration by comparing it to the naval iconography. Indeed, this makes it possible to understand what on *Vasa* was a common element and what was, on the contrary, a peculiarity. Looking at *Vasa*'s decoration, it is clear that it perfectly follows the general schemes of decoration common to all the vessels of the 17th century and previously analysed. To understand it is enough to compare the beakhead or the stern of *Vasa* to another vessel. Doing this, it can be seen that the main elements and their arrangement were similar. In particular, a very similar beakhead decoration can be found in a drawing of a Dutch East Indiaman of the 1647.

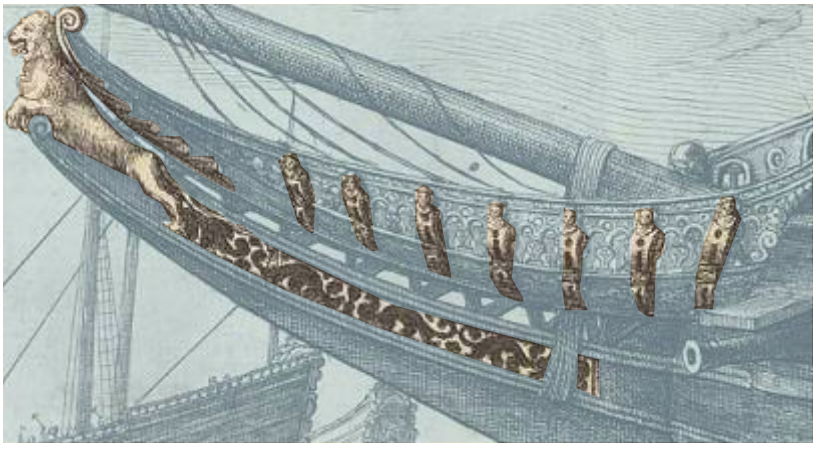


Beakhead of *Vasa*. The decorative elements are highlighted.

Not only the arrangement but also the themes used on *Vasa*'s decoration, such as Roman and mythological figures, sea creatures, tritons and mermaids, as well as floral motifs, grotesque masks and cherubs were common to the naval iconography from the European naval powers. Lions were one of the most common subjects, especially in the Dutch and English navies and on the contrary were not so used in French warship.

Detail of: Willem Van de Velde (I), *An English three-decker, with a richly decorated stern incorporating the royal arms and a figure of Justice, from the port quarter*, c.1670, The Trustees of the British Museum, London.

Detail of: Jan Abrahamsz Beerstraten, *The Battle of Terheide, 10 August 1653*, 1653 - 1666. Rijksmuseum, Amsterdam.



Wenceslaus Hollar Bohemian. Naues Mercatoriæ Hollandicæ per Indias Occidentales (Dutch West Indiaman). 1647. The MET Museum, New York.

Lions were particularly used as figureheads. The beakhead of *Vasa* is a large springing lion, the two Dutch flagships *Amelia* and *Gouden Leeuw* had both a lion as figurehead and the same subject was also used in smaller or merchant vessels. As can be seen by the several iconographical example, not only the subject, but also the position of the lion is basically identical in all the ships.

Hugo Allard (I) (attributed to), after Willem van de Velde (I). *Aemilia, Tromp's flagship*, c. 1639, Rijksmuseum, Amsterdam.

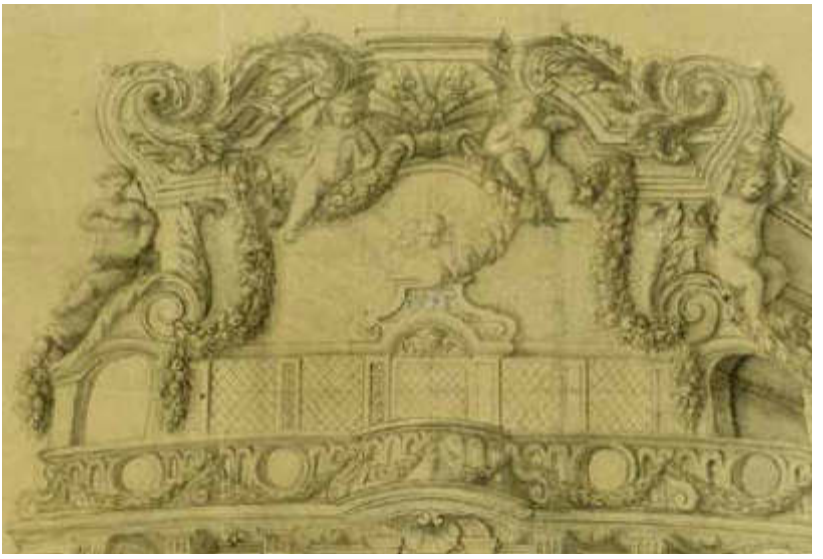
Detail of: Willem van de Velde (II), *The Lenox* (1678), Nationa Maritime Museum, London.

Detail of an English warship: Jan Abrahamsz Beerstraten, *The Battle of Terheide, 10 August 1653*, 1653 - 1666. Rijksmuseum, Amsterdam.

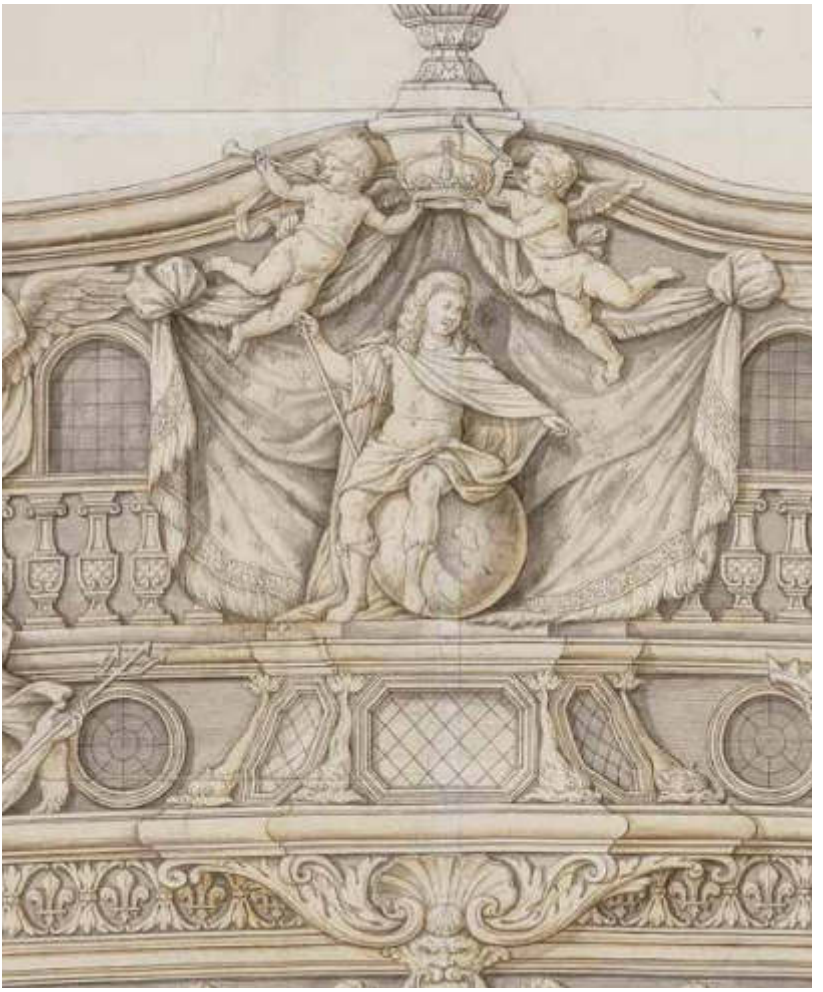
References to the contemporary reality

Even though *Vasa*'s decoration is generally similar to the other European ships, some subjects were not so widespread. One of these particular themes is contemporary reality. Most part of the decoration represents subjects from ancient times or fantasy figures. But among sea gods and Nereids, cherubs and monsters, some sculptures were also depicting something from the real and contemporary world. As said, the political condition had influenced the decoration of warships, creating a difference between the decoration of foreign states, and this theme seems to be strictly linked to the choices of the sovereigns. On *Vasa*, references to contemporary reality had three subjects: the king, his people, and his enemies. The larger sculpture is that of the young king, standing at the top of the stern decoration. The presence of the king was maybe a rare case in Swedish shipbuilding and almost absent in foreign states. Indeed, even though also England and the Dutch Republic dedicated the upper section of the stern to political subjects, they were hardly ever representations of a real person. Both states used symbols, such as animals or coats of arms. Nevertheless, this subject has a lot in common with French warship decoration. Indeed, on French first-rates, the tafferel was generally dedicated to the figure of the king which was usually the only reference to contemporary reality. Furthermore, the face of the young king was one of the most common elements present in the subject of Louis XIV style.
The sculptures showing Gustav Adolf's enemies on *Vasa* are the figure of the Pole and, probably, a triton on the starboard side wearing the cap of cardinals identifying the Catholics. Enemies of the king were not a common element even for the French ships, even though, the flagship *Royal Louis* had two Turkish in chains at the feet of the sovereign and, by the description of Hayet,[48] it is known that other representations of the Mediterranean enemies were inside the ship in order to stimulate the crew to fight.

Detail of: Jean Bérain, *Ornements de poupe de l'Agréable*, 1697, Musèe National de la Marine, Parigi.



Detail of: Belle-Veüe d'Augère sieur de René, *Le Souverain*, 1678, National Maritime Museum, Sydney, Australie.



Detail of: François Girardon, *Design for the decoration of the stern of the Dauphin-Royal*, © 2022 MutualArt Services, Inc.

Something that was not represented in French warships was the people and this is probably one of the peculiar subjects on *Vasa*. The reason was probably another reflection of the political situation. The French absolute monarchy had no reason to show its people, while Sweden was a monarchy with a Diet that had a political value and was thus better to show them, at least in the section of decoration claiming the king's right to the throne. On the Dutch Republic's ships, it is possible to see sometimes figures with adult human shapes that are probably not cherubs or tritons. Nevertheless, from the iconography alone, it seems not possible to understand if they were a representation of the Dutch people or just warriors from some mythological story.

Anonymous, First-rate Holland warship, 1670 - 1726, published in Amsterdam by Gerard Valck, Rijksmuseum, Amsterdam.

Anonymous (Circle of Jacob Adriaensz Bellevois), *Dutch Ships in a Lively Breeze*, probably 1650s, National Gallery of Art, Washington.

Gunport lids decoration

One of the most uncommon decorations on *Vasa* is the presence of lion heads on the gunport lids. Certainly, this choice was in line with the lavish decoration programme and it would make appear the new warship on par with the richest flagships of the other European fleets of the 17th century. However, comparing *Vasa* to the naval iconography of that time, it appears that it was not common, or at least, there is not much iconographical evidence of it. The iconography of the first half of the century shows the sides of ships almost completely unadorned if not for the upper part, and lids of gunports are in bare wood, like the hull. The paintings by Cornelis Verbeeck (1585/1591 – after 1637) as *A Naval Encounter between Dutch and Spanish Warships* and *Men o' war outside the coast with a city and a fort beyond*, the dramatic scene of *The battle of Gibraltar in 1607* by Cornelis Claesz van Wieringen (c. 1576 – 1633), the work *Ships off a Rocky Coast by* Adam Willaerts (1577 – 1664), and the print *Conquest of three pirate ships by Captain Cornelis Daniels* by Adriaen Pietersz van de Venne (1589 – 1662) are only a few examples of the many iconographical evidences that these and other artists of that time created and they all represented bare gunport lids.

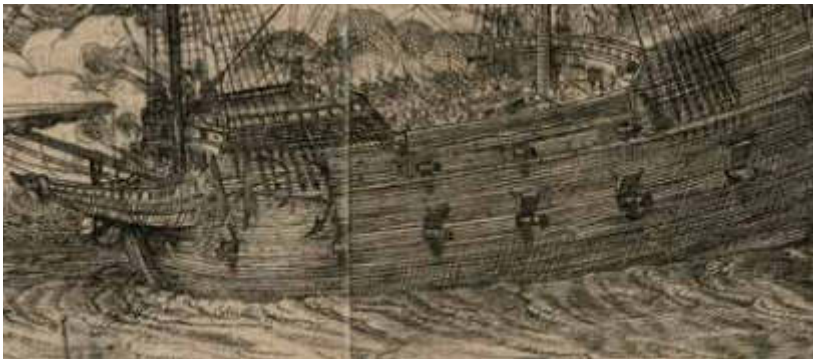
Decoration on lids was probably used in the French navy, even before Colbert's revolution of the navy. Indeed, it is possible to see this kind of decoration in the painting *A Warship Built for France and a Dutch Yacht under Sail* by the Dutch artist Jacob Gerritz Loef (1605 – 1680). The painting shows the aforementioned warship built in 1626 by the order of Louis XIII in a Dutch shipyard. The ship painted is similar to *Vasa* in different aspects. Firstly, time and workers were similar, since they were both built in the 1620s by Dutch shipbuilders for a foreign navy, with the difference that *Vasa* was directly built in Stockholm, while the painted ship was built in a Dutch shipyard, and then brought in France. Secondly, also the structures are similar, as both ships have two gun decks, even if the French ship in the painting only has 9 cannons per deck, while *Vasa* has 12 cannons in each tier, so the French one was probably smaller than *Vasa*. They both have three masts plus the bowsprit. Comparing the side decoration of the two ships, they follow almost the same logic. From the aft to the fore part, decoration is in the projecting gallery, in a coloured line running for all the length of the bulwark, in gunports, and in the beakhead. The main difference that immediately appears is probably the colour; the French ship is painted in blue and gold, which are the colours of the House of Bourbon, while *Vasa* is mainly decorated in red and gold. Concentrating on gunports, the painting clearly shows that they were decorated, each with a golden ornament that seems three-dimensional placed in the middle of the lid on a blue background. That would be really similar to the decoration on *Vasa*'s gunport lids.

Detail of: Cornelis Verbeeck, *A Naval Encounter between Dutch and Spanish Warships*, c. 1618/1620, The National Gallery of Art, Washington.

Detail of: Cornelis Verbeeck, *Men o' war outside the coast with a city and a fort beyond*, 1625-30, Private collection.

Detail of: Cornelis Claesz van Wieringen, The battle of Gibraltar in 1607, c. 1621, Rijksmuseum, Amsterdam.

Detail of: Adam Willaerts, *Ships off a Rocky Coast*, 1621, Mauritshuis, The Hague.

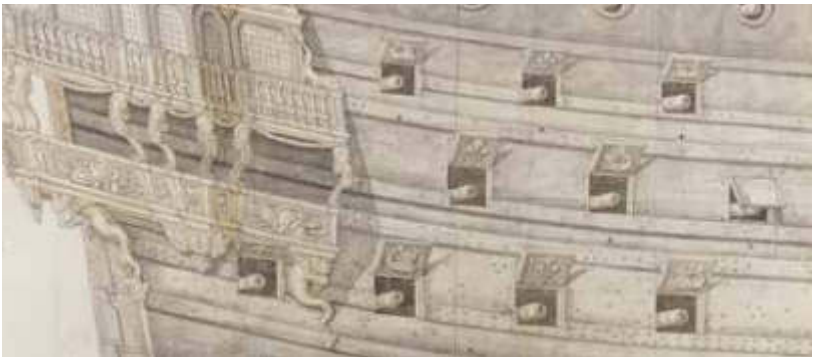


Detail of: Adriaen Pietersz van de Venne, *Verovering van drie piratenschepen door kapitein Cornelis Daniels (alias Brackman)* (Conquest of three pirate ships by Captain Cornelis Daniels), 1619, Rijksmuseum, Amsterdam.

Detail of: Jacob Gerritz Loef, *A Warship, built in 1626 by order of Louis XIII in a Dutch shipyard, Arriving at a Dutch Port under Guidance of a Dutch Ship*, 1626 - 1635, Rijksmuseum, Amsterdam.

Detail of: Anonymous, *Vaisseau allegorique Les lys fleurissent dans les vagues*, c.1630, Gallica.

Detail of: Jean Bérain, *Soleil Royal Stern and bow drawings*, in: Georges Toudouze et alii, *Histoire de la Marine,* Paris, Les Éditions de L'Illustration, Baschet et Cie, 1959; Vol. 1, pp. 148-149.

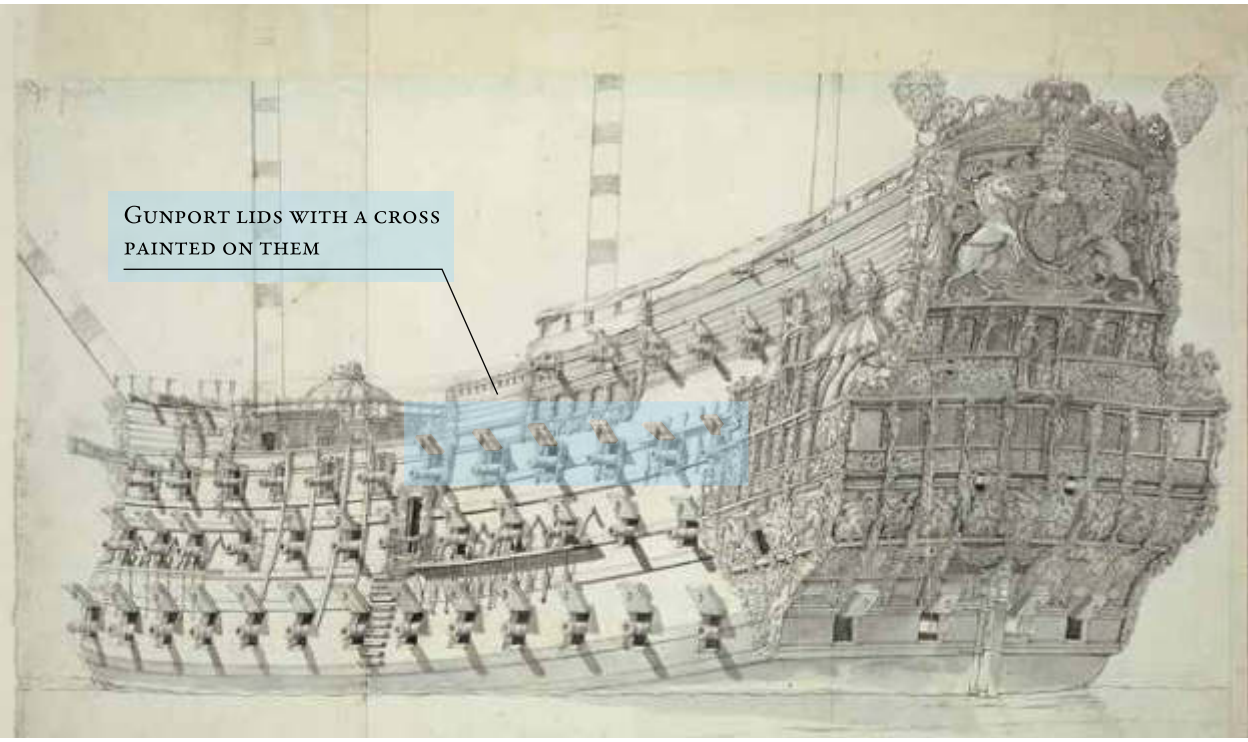


Detail of: Girardon, François. Design for the decoration of the stern of the Dauphin-Royal. © 2022 MutualArt Services, Inc.

Detail of: Pierre Puget, *Design for the decoration of a Warship*, 17th century, Rogers Fund, 1963, The Met Fifth Avenue, New York.

At the time of Louis XIII (1601 – 1643), France did not have a developed navy yet and a two-decker like that likely was one of the biggest and thus one of the most decorated ships. Considering this, it is also possible that decorations on the gunport lids were three-dimensional sculptures, since France had this kind of decoration in the most important ships of its navy during the whole century. Gunport lids with three-dimensional ornaments are as well depicted in an anonymous French engraving from about 1630, entitled *Florescunt lilia in undis* (Lilies bloom in waves); even if the image shows an allegoric vessel representing the kingdom of France and not a real vessel, the fact that those sculptures are there is still interesting since they testify the ideal aesthetic taste. Moreover, there is also a continuity in the evolution of ship decoration in the French navy. Sculptures on gunports are clearly visible in the drawing of the flagship of the West squadron, the *Soleil Royal*, painted by Jean Bérain (1640 – 1711). Another example can be seen in the drawings made by François Girardon for the design of the stern decoration of the *Dauphin Royal*; in these two drawings of the stern (one from the side and one from the front), all gunports are enriched by sculptures of crowned dolphins or lilies. *The Design for the decoration of a Warship* made in the 17th century by Pierre Puget, preserved at the Metropolitan Museum of Art in New York, is another interesting example. The ship depicted is probably an ideal ship and not a real one since the decoration is excessive even for a French first-rate. Nevertheless, it is an interesting drawing considering that Puget was one of the artists working on the design of warships decoration at the Toulon arsenal. In Puget's drawing, gunports are decorated with sculptures that have the peculiarity to be placed in the outside part of the lids, as if they were designed to be seen when gunports were closed.

Except for some French first-rat and some imaginary ships, studying the naval iconography of the time sculptures in gunports are not a common detail. According to the iconography, the English flagships that followed one another over the first half of the 17th century, the *Prince Royal* and the *Sovereign of the Seas*, had no sculptures on gunport lids. The aforementioned *Prince Royal* had an important role in the evolution of shipbuilding, since her design was pushing further the maximum dimension in shipbuilding introducing a third gun deck. She was also the new flagship of the English fleet and she was richly decorated. The Museum Boijmans Van Beuningen of Rotterdam holds a drawing by Willem van de Velde the Elder (1611 – 1693) with the title *The English Flagship 'Royal Prince', built 1610, captured and burnt by the Dutch, 13 June 1666*. In this well-detailed drawing, it is possible to see the *Royal Prince* in a three-quarter position and although the stern shows a lavish decoration and the upper tier of cannons had a carved frame, not one of the gunport lids has sculptures. However, looking carefully at the first six lids from right to left in the upper tier, it is possible to see a cross depicted

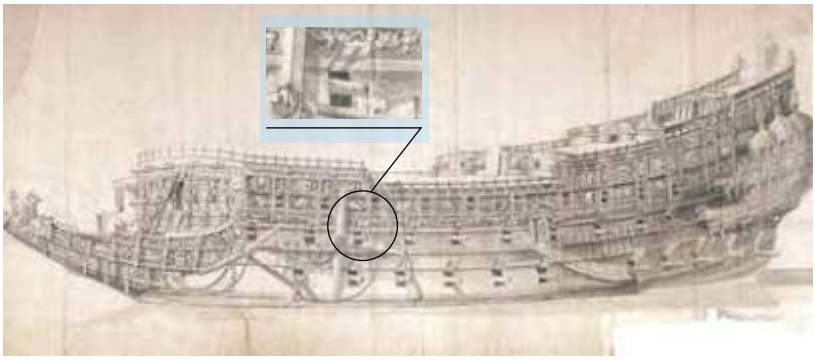


Willem van de Velde (I), *The English Flagship 'Royal Prince', built 1610, captured and burnt by the Dutch, 13 June 1666,* 1670 (?), The Museum Boijmans Van Beuningen, Rotterdam.

on them. Even if the drawing is in black and white, it is reasonable to think that it was a red cross on a white background, that is the flag of Saint George, an emblem of England since the Late Middle Ages, used as the Elizabethan and early Jacobean flag officers, and in general worn by the English navy in different combinations.[49] This could be a kind of decoration used on special occasions on the flagships of the English navy during the 17th century since there is the same cross in the gunports lids of the middle tier in the drawing of the *Sovereign of Seas* by Willem van de Velde the Elder. However, other paintings of these and other English flagships do not have this kind of decoration, such as the painting *The Capture of the Royal Prince* made by Willem van de Velde the Younger. Here, the gunports of the English flagship are clearly visible and none of them has any kind of decoration. Van de Velde the Elder showed another example of these crosses painted on port lids in the drawing of the ship *Admiral of Genoa*, a 60-gun Venetian warship built in Amsterdam for the Doge of Venice in 1655, linking this theme also with the Mediterranean tradition.

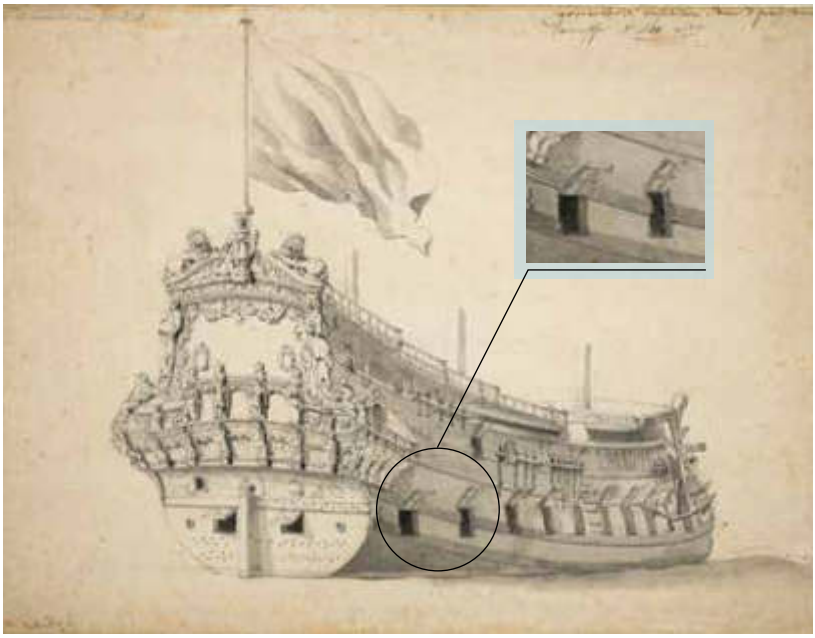
There are also iconographical examples of gunport lids painted with flags' colours in Northern Europe art. During the second half

[49] A.E.H. Holmes, *Dictionary of Sea Painting*, Woodbridge, Antique Collector's Club Ltd. 1989 (2nd edition 1989), pp. 18-32.



Willem van de Velde (I), *The so-called Morgan drawing, the Sovereign of the Seas (1637).*

Detail of: Willem van de Velde (II), *The Capture of the Royal Prince*, c. 1670, The National Gallery, London.



Willem van de Velde (I), *Admiral of Genoa*, 1665 (?), National Maritime Museum, Greenwich, London, Caird Collection.

Detail of: Claus Møinichen, *Slaget ved Øland, 1 juni 1676* (The battle of Öland), Between 1685 and 1710, National Museum of Denmark, Copenhagen.

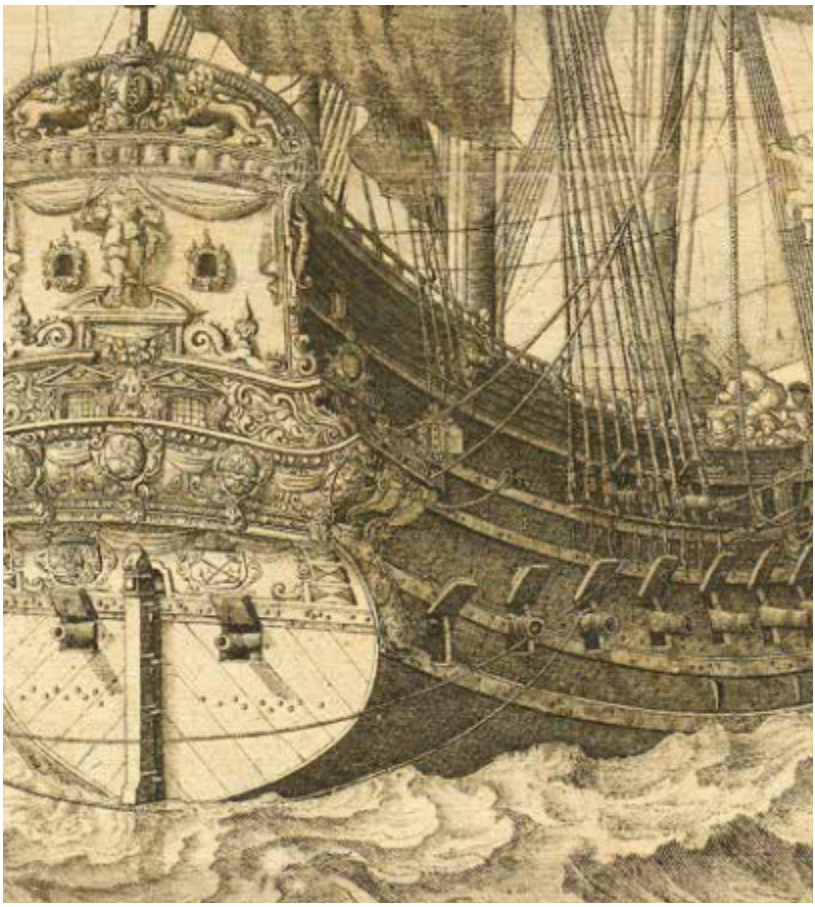
Berent van der Eichen, *The Rosenborg Tapestries, battle of Øland*, 1685-93. Rosenborg castle. Copenhagen.

Detail of: Medal for the Battle of Køge Bay 1677, foreside, Nationalmuseets, Copenaghen.

of the 17th century, the Danish artist Claus Møinichen (1665 – 1710) painted two Danish naval battles, which are the battle of Öland (1676) and the Battle of Køge Bay (1677). The first war action is depicted in the painting *Slaget ved Øland, 1 juni 1676* (The battle of Öland), today preserved at the National Museum of Denmark in Copenhagen. This painting depicts the allied Danish-Dutch fleet fighting against the Swedish navy in the Baltic Sea for naval supremacy and clearly shows all the gunport lids of both fleets painted with the colour of their flags, a yellow cross on blue background for the Swedish fleet, and a white cross on red background for the Danish one. It is also interesting that the Dutch ships have the same painting as the Danish ones. The other Møinichen's painting is the *Battle in Køge bay*, made in 1686, and it shows the same kind of gunport decoration. Other examples are in *The Rosenborg Tapestries* of the Rosenborg castle, in Copenhagen, which was woven between 1685 and 1693 and shows the victories of Christian V of Denmark (1646 – 1699) in the Scanian War (1675-1679). In the tapestries, there are four scenes of naval actions where gunports are painted with the flag's colours. Two of these represent the same naval battles painted by Møinichen, the battle of Öland and the Battle of Køge Bay, the third is *The Landing at Rügen*, and the fourth is *The battle at Møen*, fought on 1 June 1677. Crosses appear also on the gunport lids of the ships in a gold medal struck in 1677 to commemorate the Danish victory on the Swedish fleet in the Battle of Køge Bay from the collections of the National Museum of Denmark. Despite few examples, generally, there is not evidence of flags painted in gunport lids and usually, the naval iconography does not show this kind of decoration, not even in Danish ships. For example, the painting of the Battle of the Ferhmarnbelt (1644) by Jan Van der Velde, preserved at the Maritime Museum of Stockholm, shows the Danish fleet fighting against the Swedish navy and there is no decoration on gunport lids. Thus, flags' colours on gunport lids may be used on some particular occasions and perhaps it was more common during the Scanian War in the Danish fleet. Otherwise, it could simply be an artist's choice to emphasize the identity of each ship and enrich their works.

Detail of: Jan Van der Velde, *The naval battle of Fehmarnbelt 1644*, 17th century, Sjöhistoriska museet, Stockholm.

Detail of: Jan Beerstraten, *The battle of Ter Heiden*, c. 1654, Rijksmuseum, Amsterdam.



Detail of: Willem van de Velde (I), *Seascape with the Dutch Men-of-War including the Drenthe and the Prince Frederick-Henry,* Rijksmuseum, Amsterdam.

More often, gunport lids in iconography do not have any kind of decoration. During the 17th century, the sea had become the theatre of many conflicts between the European powers, and naval wars became one of the main subjects in artists' canvases. The high number of naval paintings gives a good understanding of naval warfare of that time, showing also different details of shipbuilding and ship decoration. During the second half of the century, the first three Anglo-Dutch Wars supplied many subjects for maritime painters. In the painting *The Battle of Ter Heiden, 10 August 1653*, painted by Jan Beerstraten (1622 – 1666), opened gunports of both Dutch and English fleets are displayed in great detail. Looking at them, it is possible to see on almost all gunport lids the metal rings where ropes used to open and close them were tied. However, there is no sign of decoration on the lids, not even in the Dutch flagship placed in the middle of the painting, the *Brederode*. The same thing is shown in many other paintings, such as in the drawing by Van de Velde the Elder, *Seascape with the Dutch Men-of-War including the 'Drenthe' and the 'Prince Frederick-Henry'*. This ink drawing does not show colours but it makes it clear that no decoration was present in those Dutch ships' gunport lids. Another example made by the same artist is the drawing *Council of War aboard 'The Seven Provinces', the Flagship of Michiel Adriaensz de Ruyter, 10 June 1666,...* In this work of art, gunports are depicted in great detail, and again there is no decoration on their lids.

Van de Velde the Younger showed with colours the same type of gunports depicted by his father. Examples can be found in the paintings *A Dutch Flagship Coming To Anchor With A States Yacht Before A Light Air* (1658), preserved at the National Maritime Museum in London, and the *Captured English Ships after the Four Days' Battle* (Rijksmuseum, Amsterdam) showing the flagships *Royal Charles*. As well as the Van de Velde studio, other maritime painters showed in their works the lack of decoration in gunport lids of 17th-century warships. For instance, the *Royal Charles* was also painted in the work *The seizure of the English flagship 'Royal Charles', captured during the raid on Chatham, June 1667* by Jeronymus van Diest (II) (1631 – after 1677). The Dutch painter Adam Willaerts and the French Jacob Adriaensz Bellevois (1621 – 1675) made a wide range of naval paintings depicting warships on different occasions

Willem Van de Velde (I), *Council of War aboard The 7 Provinces, the Flagship of Michiel Adriaensz de Ruyter, 10 June 1666, preceding the 4 Days' Battle,* Rijksmuseum, Amsterdam.

Detail of: Willem van de Velde (II), *Captured English Ships after the Four Days' Battle*, c. 1666. Rijksmuseum, Amsterdam.

and in their works, gunport lids are always unembellished. Abraham Storck (bapt. 1644 – buried 1708) made, among many others, paintings of the Four day Battle (1666) and the Battle of Texel (1673); not even in his paintings there is decoration on gunport lids. Neither the *Britannia*, a 100-gun first-rate ship of the line of the Royal Navy, built by Phineas Pett (II) at Chatham, has any decoration in gunport lids, neither in her ship-portray made by Isaac Sailmaker (c. 1633 – 1721) nor in the drawing made by Willem van de Velde (?) around 1685, both now preserved at the National Maritime Museum, Greenwich, London. Another important 100-gun ship of the English navy was the *Prince* and from the painting by Jan Karel Donatus van Beecq (c. 1638 – 1722), titled *The HMS 'Prince' Before the Wind,* no decoration seems to be present on lids. According to the paintings that depict these warships, they should not have decoration in gunport lids. Moreover, the Greenwich Museum holds many drawings

Detail of: Jan Karel Donatus van Beecq, *The HMS Prince Before the Wind*, 1679, National Maritime Museum, Greenwich, London, Caird Collection.

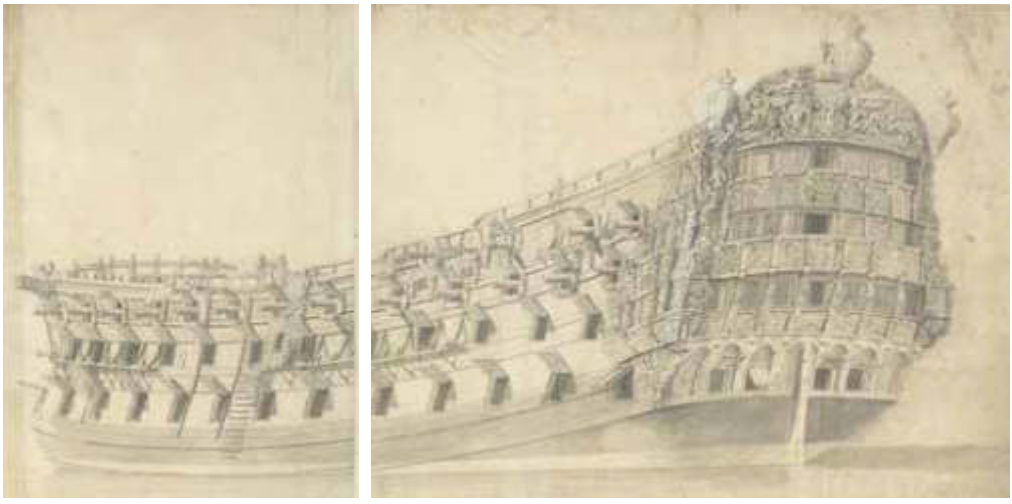
Willem van de Velde (II), *An English Warship Firing a Salute*, 1673, The Lee and Juliet Folger Fund, National Gallery of Art, Washington.

by Van de Velde studios depicting English or Dutch ships, and in almost all of them gunport lids only have their rings, with no decoration. Nevertheless, it is still possible to find some iconographical examples of sculptures on gunport lids in the English fleet of the 17th century. One of these is the painting *The 'Resolution' in a Gale* by Van de Velde the Younger. It represents the *Relosution* (1667), a 70-gun third-rate ship; all gunports on the lower deck are closed but in the upper tier, gunports have their lids lifted showing a golden decoration on them. Another interesting drawing by the Van de Velde's studio is the *Rijkversierd Engels (?) fregat* (Richly decorated English Frigate) made in two separate sheets, where it is possible to see lion heads sculpted on gunport lids, curiously the same subject on *Vasa*'s. The ship does not have any specification about her name, but she represents the top class of the navy. Indeed, she is a full three-decker, with 13 cannons for the first two decks, 14 on the lowest, and a fourth half-deck with 5 cannons. Considering also the four cannons on the stern, and assuming that there could have been two other cannons in the bow not visible, she should have had at least 96 cannons. That was a first-rate ship, one of the biggest and most important of the fleet. This explains the rich carving of the wreathed gunports of the first two tiers, a typical decoration used on all the English first rates of the 17th century, from the *Prince Royal* to the *Royal Charles*, the *Prince*, and the *Britannia.* But differently from the ship in Van de Velde's drawing, no one of them had evidence of sculptures on the lids of their gunports. Even if the drawing is not dated, it could probably have been made in the 1670s or in the first years of the 1680s. Indeed, some drawings and models of ships from those years show some similarities with Van de Velde's drawing, in particular considering the stern shape. Indeed, in the second half of the

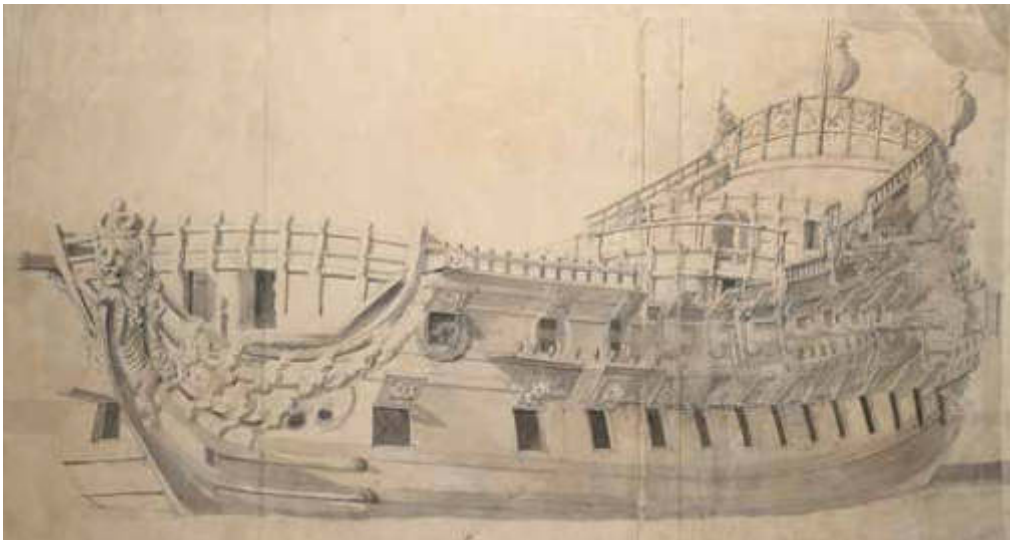
Detail of: Willem van de Velde (II), *The 'Resolution' in a Gale*, c. 1678. National Maritime Museum, Greenwich, London.

17th century, the flat continuous space in the upper half of the stern, which was early dedicated to decoration, had been reduced, leaving space for a second tier of windows; also the profile of the top changed.

Many English ships built in the '70s and '80s derived from a construction programme aiming to build thirty ships of different sizes, started in 1677 by the Parliament in order to balance the numerous French fleet. One of the first ships to be built under this programme was the *Lenox* (1678), a 70-gun two-decker. Willem Van de Velde the Younger made different drawings of her, some now at the Naval Maritime Museum of Greenwich. Although the *Lenox* had only two gun-deck, comparing her with the nameless one, the similarity is clear. Moreover, she presented lion heads in all her gunport lids, exactly like the three-decker. A comparable drawing of Van de Velde the Elder is the portrait of the *Suffolk* (1680?); in the drawing, one gunport lid, precisely the second from the left in the lower gun deck, shows a lion head. The other lids are only roughly and quickly drawn and thus do not show any detail. Moreover, in this period, decoration on the gunport lids is testified not only by Van de Velde. An anonymous painting entitled *An English First-Rate Ship* at the Royal Collection Trust, in London, depicts a three-deck with golden decoration standing out from the red background of the gunport lids. Another example can be found in a model of a 90-gun warship dated 1675, preserved at the National Maritime Museum of Greenwich. According to the museum, this model was probably a preliminary study for the design of the 90-gun ships that had to be built during the construction programme of 1677. The presence of lion heads on its lids shows that this kind of decoration was a detail hypothesized for the 90-gun warships built during this construction programme. Finally, during the same period even if in a completely different type of ship, the galley-frigate *Charles Gally* (1676)

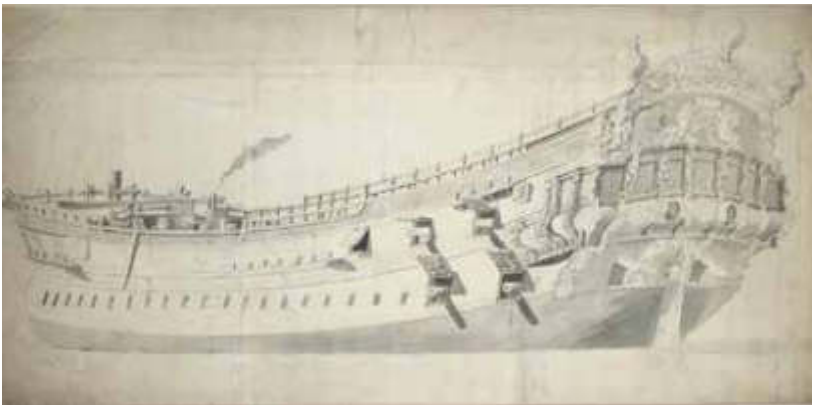


Willem van de Velde (?), *Rijkversierd Engels (?) fregat*, N.d., Rijksmuseum, Amsterdam.



Above: Willem van de Velde (II), *The Lenox* (1678), Nationa Maritime Museum, London.

Beside: Anonymous, *An English First-Rate Ship*, after 1683, Royal Collection Trust, London.



Willem Van de Velde (II), *Portrait of the Charles Galley*, 1676?, National Maritime Museum, Greenwich, London, Caird Collection.

painted by Van de Velde the Elder in the *Portrait of the 'Charles Galley',* had lion heads in the three open gunport lids on the aft part of the hull. Although there are also different examples of iconography showing ships built in the construction programme that do not have any decoration in gunport lids, it is still relevant that almost all the English pieces of evidence of lid decoration are lion heads and come from a concentrated period, that is from the end of the 1660s to the first years of the 1680s. Moreover, the lion remained a symbol of power during the ages and also the fine model of the first-rate *Royal George* (1756), made for King George III (1738 – 1820) in the 1770s, had head lions panted on the gunport lids; the model is preserved in the National Maritime Museum, Greenwich, London, Greenwich Hospital Collection.

In conclusion, it is difficult to find iconographical pieces of evidence of decoration in gunport lids since mostly they were depicted by different artists as completely unadorned. However, there were some exceptions. French first rates were one of these since symbols of the monarchy were used to decorate also these parts of the ships. Moreover, it seems that it became a decorative trend popular in the second half of the 17th century in English shipbuilding. Nevertheless, it still remains a rare habit, especially in the first half of the century. The reason could be practical, since adding sculptures would have increased the weight of lids, which means that more men were required to lift them, and so causing a worsening in their use. However, beyond all this, *Vasa* is still there with her lion heads placed on each lid of her gunports. This shows once again her importance as historical evidence, not only to prove the rightness of things that other pieces of evidence had already proved but also to teach unknown details about shipbuilding in the 17th century.

Appendix

Naval Iconography in the 17th Century: analysis and materials for further researches

Previous page: Willem van de Velde, *The head of a Dutch yacht*, c. 1686, National Maritime Museum, Greenwich, London.

Even though it can be acceptable to refer generally to naval iconography using the word "art", not all naval iconography focuses on aesthetics and formal aspects of ships. A drawing made by Willem van de Velde the Elder, which should hang on the wall of an English naval official, is undoubtedly an artistic iconography. On the contrary, the plate representing a ship, made for the *Encyclopedia* by Denis Diderot (1713 – 1784) and Jean-Baptiste Le Rond d'Alembert (1717 – 1783), or the drawing of a hull by Manuel Fernandes in his *Livro de Traças de Carpintaria* (1616) are not properly artistic images. Both of them could be described better as "technical drawings", even though they were made for a different use and a diverse public. Thus, the term "naval iconography" gathers artistic production and technical drawings. In trying to understand the difference between "artistic naval iconography" and "technical naval iconography", different aspects should be taken into consideration.

The artist – One of the main differences between these two categories of iconography lies in the persons who make them. By using the definition "artistic naval iconography", all the pictures created by artists are included. It means that this kind of iconography is made by someone educated in drawing and painting but who is not necessarily an expert in shipbuilding and naval affairs. On the other hand, "technical naval iconography" indicates all the images created by an expert in ship design who is not an artist (such as a shipwright or a superintendent of an arsenal). This distinction translated into a significant divergence in what is depicted, even if the subject is the same. Indeed, while an artist is more interested in the aesthetics of ships and thus in how ships appear, a person skilled in naval design will pay more attention to technical aspects, having in mind how ships are made, but they could be unconcerned about the aesthetics and artistic effect. It is also true that sometimes artists have been commissioned technical drawings. The result of this mixture of skilled hand and technical perspective was often the production of refined works.

The client – Another figure who influences the final outcome of the iconography to a large extent is the customer, that is, the person who commissions the work. Indeed, their requests and expectations lead the decisions of the artist since is the client to decide the general subject and thus what has to be painted and what aspect should be valorized.

The recipient – An unintentional figure who influences the iconography production is the recipient of the images. Indeed, the ideal public could impact the artist's choices about what and how to display. For instance, if a painting was created for interested and knowledgeable people, the accuracy had to be irreproachable. Instead, if a drawing was thought to teach something to a non-knowledgeable public, images had to be explicative and understandable. For instance, this was the case with regard to the treaties on shipbuilding of the 17th century.

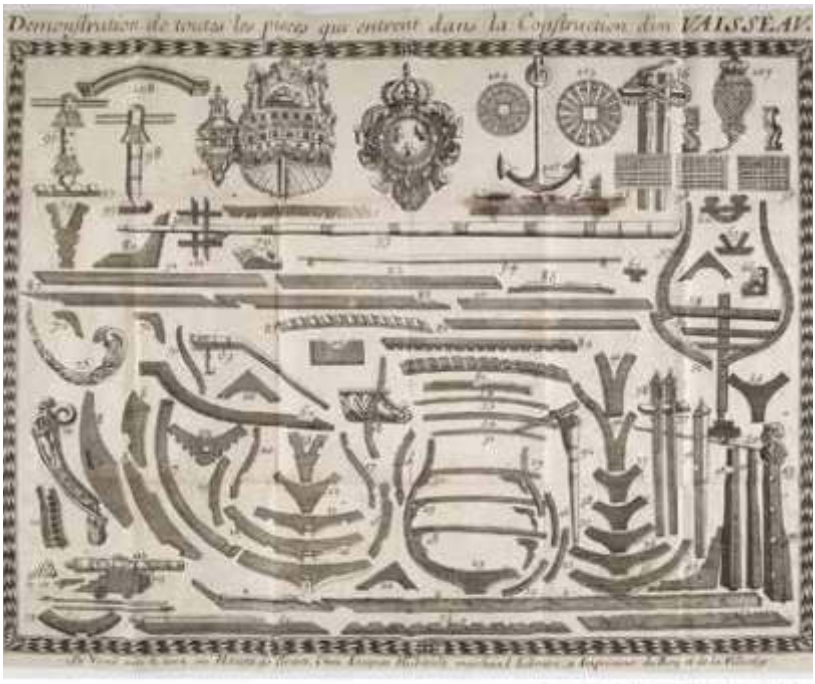
The purpose – A distinction should also be made concerning the purpose of images. Artistic drawings and paintings were usually made for private clients and intended to embellish houses, offices, and other private or public spaces. Instead, technical drawings aim to preserve, transmit, and teach a specific technical knowledge or to be an active part of the ship design process (although this attitude developed from the 18th century onwards). For this reason, artistic and technical images focused on different aspects. Artistic iconography aims to improve the aesthetics, while a technical drawing is concentrated on technical parts of ships and the rightness of proportion and dimension is much more important.

Starting from these elements, three main categories have been identified: artistic, descriptive, and technical iconography. The"artistic" iconography includes all the drawings and paintings made by artists and meant to be displayed in private or public spaces. Generally, it is characterized by the care in visual results and a refined technique. What is not included in the "artistic iconography" are pictures that mainly focus on technical aspects of ships. Because of that, the maker was generally an expert in shipbuilding rather than an artist. These works could also be enriched with texts and graphic elements, and the geometrical representation was preferred to a realistic setting. According to the purpose, these images can be divided into "descriptive" and "technical". Descriptive iconography has the primary purpose of describing their subject and making it comprehensible to everyone. In other words, dissemination of knowledge is the primary aim. Since it addresses a not-knowledgeable public, it has to be mainly descriptive and explicit. Differently, technical iconography is part of the design process and is made by experts for experts. The principal aspects are the precision of representation and a sufficient level of detail.

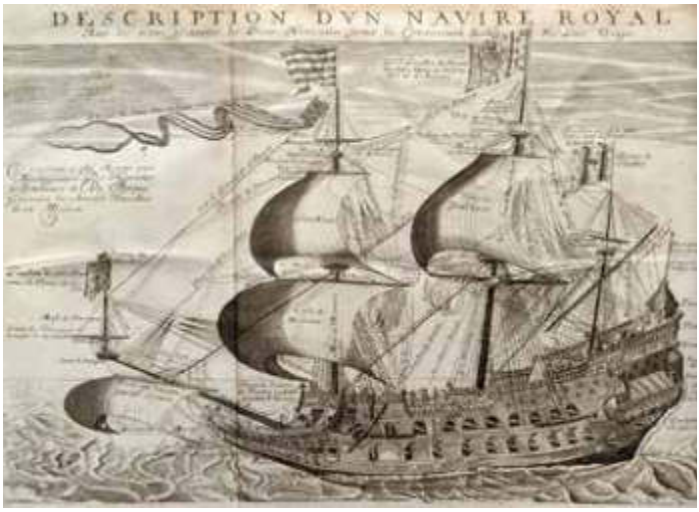
1. Technical and descriptive naval iconography

Early treatises on shipbuilding

The first technical treatises began to appear in the Mediterranean area already during the 15th century. They illustrated the practical process of shipbuilding and were enriched by drawings illustrating the different steps of the process. These were the first technical drawings. These first approaches to technical treatises, such as by Michele da Rodi (1385 – 1445) and Fernando Oliveira (1507 – c. 1581), saw a rapid development and diffusion during the following centuries, thanks to several scholars, such as George Fournier (1595 – 1652) with the *Hydrographie*, Bartolomeo Crescenzio (1565 – 1605) author of the *Nautica Mediterranea* (1607), and Joseph Furttenbach (1591 – 1667), who wrote the *Architectura Navalis* (1629). At that time, naval treatises had the main purpose of disseminating knowledge but did not affect the construction process of the ships yet. Indeed, they were not meant for shipwrights, who knew how to do their job and did not need any bi-dimensional support. Instead, naval treatises were generally dedicated to kings or nobles as homage and illustrated the shipbuilding process. In creating them, makers were well aware of the fact that their works would be read by uninitiated eyes. These first treatises showed in a written form the empirical and practical techniques of shipbuilders. The images attached to these manuscripts



Jacques Hubault, *La Construction des Vaisseaux du Roy,* 1691, Havre de Grace: Imprimeur du Roy & de la Ville. Source: Gallica.bnf.fr / Bibliothèque national de France.



George Fournier, *Hydrographie*, Paris, Michel Soly, 1643.

represented in painful detail the various constructional elements, such as ribs, oars and masts, sometimes providing tables showing all the components that made up a ship. Thanks to these sources, it is possible to have a good understanding of the ships of the time and the tools used for their construction. These first examples initiated the practice of cataloguing, analysing, studying, and describing technical knowledge in a "scientific" way – even though it is not possible to talk about "the science of shipbuilding" as mathematics and algebra were not yet part of the technical-constructive process – and creating a technical-descriptive compendium of the knowledge of shipwrights. Given the aim of these first manuscripts, the iconography that they showed had a "didactic purpose"; for this reason, their evolution is more similar to the encyclopaedic texts rather than to the later naval treatise in the modern sense.

One of the first impulses of a change in naval design appeared in the English world during the 17th century. However, this change became effective only in the following century, when shipbuilding transformed from a purely experience-based art to an applied science. That slow process highlighted that before building a ship, a preliminary study was necessary; that was the birth of the construction plans in the modern sense. New disciplines, such as mathematics, algebra, and geometry, became part of shipbuilding, allowing the development and innovation of shapes that only "engineering" calculation could support, going beyond the traditional schemes. Mathematicians played a crucial role as they brought improvements in shipbuilding, using the study of geometry, statics and more specialized disciplines, such as hydrostatics and hydrodynamics". In particular, it was the French world that sealed the union between naval construction and science, with the interest of purely mathematical minds, such as Leonhard Euler (1707 – 1783), who led to the birth of the discipline known today as "naval architecture".

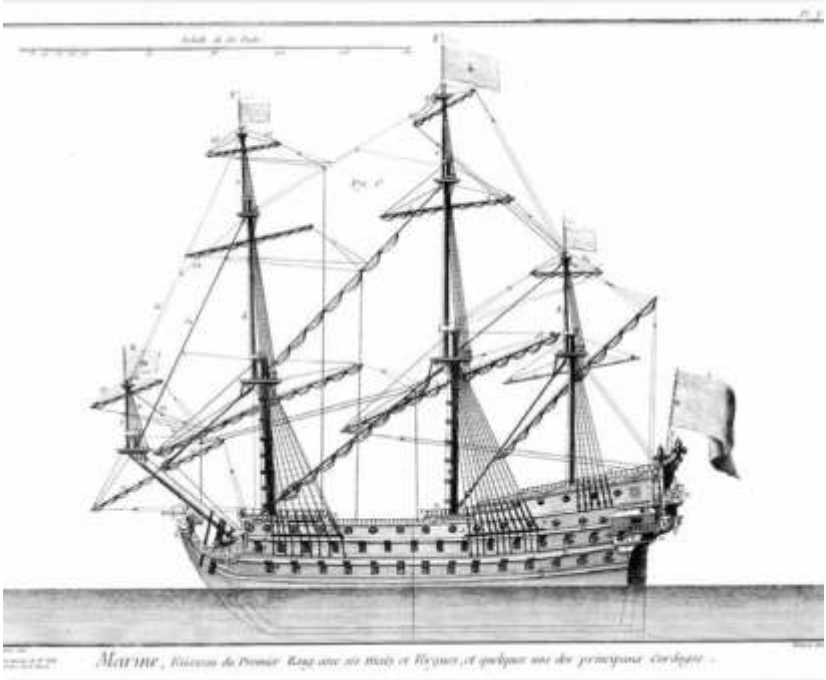


Plate 1, in: "Marine," *Supplément à l'Encyclopédie ou Dictionnaire raisonné des sciences, des arts et des métiers,* vol. 7 (plates), Paris, 1765.

Trans.: "Sailing." The Encyclopedia of Diderot & d'Alembert, Collaborative Translation Project. Ann Arbor, Michigan Publishing, University of Michigan Library, 2010.

Designing a vessel, from the axe to the pen

Over the centuries, shipbuilding has experienced profound changes in construction techniques and technologies, in the use of materials and in the types of ships. Its history is studded with innovations, inventions and characters that led to the development of shipbuilding in the modern sense. Nevertheless, going into the history of naval iconography, it may not be so obvious to learn that, for a long time, there was no technical representation for design purposes. Ships and naval fleets were represented only in an artistic context and with a purely illustrative and pictorial purpose. In the artistic representations, however detailed they might be, the purposes were more illustrative than technical-analytical. The world of shipbuilding, on the other hand, was in the hands of shipwrights, figures born and raised within the naval arsenals and who learned and in turn handed down technical knowledge purely orally and practically. Therefore, the passage of knowledge did not provide for a paper or iconographic support, so the representation of ships was completely outside both the training context of future builders and shipbuilding.

At the dawn of the 1500s, shipwrights used some unwritten rules of proportion between the length, width, and height of the hull, following the "rule-of-thumb". Their work was based mainly on their experience, their trained eye and the local tradition, which was handed down from expert craftsmen to their pupils. The practicality of their work and the use of only a few theoretical dictates make it clear how the preparation of these professional figures did not include an in-depth knowledge of

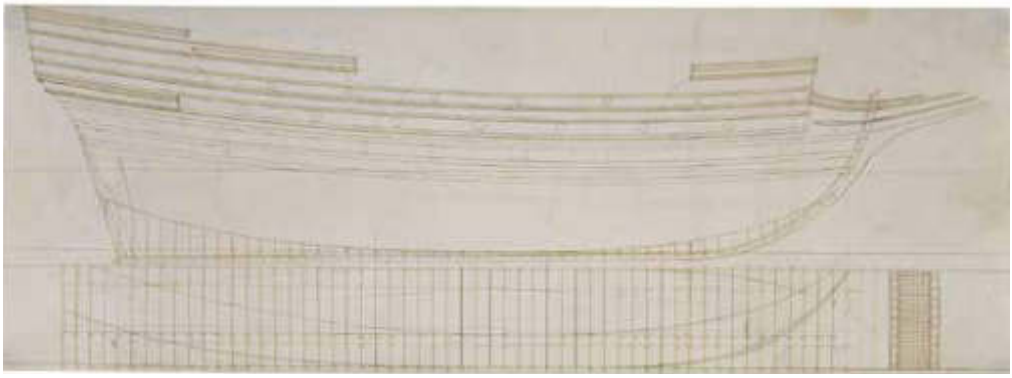
Manuel Fernandes, *Livro de Traças de Carpintaria*, 1616, Ajuda Library, Lisbon.

mathematics, nor did they necessarily require literacy. Since there were no mathematical calculations other than proportions based on simple arithmetic estimates to support the shapes made, it was not unusual to have to correct some constructional elements of ships after the launch. One of these expedients was called "girdling"; it consisted in adding a layer of planking at the waterline to increase the stability. Without precise dictates, ships built were almost unique works and not identically repeatable even if similar. Captain George Waymouth (c. 1585-c. 1612), an expert navigator and considered an authority on shipbuilding, severely criticized contemporary shipwrights stating, in his manuscript *The jewel of Artes* (1604):

> «Yet could never see two ships builded of the like proportion by the best and most skilful shipwrights ... because they trust rather to their judgment than their art, and to their eye than their scale and compass.»[1]

The principal dimension used for building a vessel was the width of the midship section, starting from which the length and depth of a hull were calculated. Therefore, the midship section was the base for the creation of the shape of the vessel body. To determine its form, shipwrights proceeded by making a life-size wooden model. Given the efforts and the amount of material used to obtain these models, they were used for building all the other sections of the ship. Indeed, by successive proportions and adjustments, shipwrights obtained the narrowing of the hull and the resulting shapes at the stern and bow. The operations to calculate the

[1] M. Oppenheim, *A history of the administration of the royal navy and of merchant shipping in relation to the navy*, London, New York, John Lane, 1896.



Anonymous, Russian (?), *Drawing of a 12-gun Ship (5th class by mid-17th-century classification) of Dutch Design*, 1670s, The State Hermitage Museum, Saint Petersburg.

narrowing of the sections and the elevation with respect to the keel were another important phase of shipbuilding. Several techniques were used for this purpose. One of the most common was called *mezzaluna*, also used by the Portuguese, who called it "meia luna", and by English shipwrights, who called it "whole-moulding". This method used three-dimensional geometric supports to determine the shapes of the hull, and the results were established by a comparison with the models made on a 1:1 scale.[2] There were no mathematical calculations to guide the reduction of the sections towards the ends, but we proceeded through slight graduations defined on the basis of rules and proportions directly applied to the models.

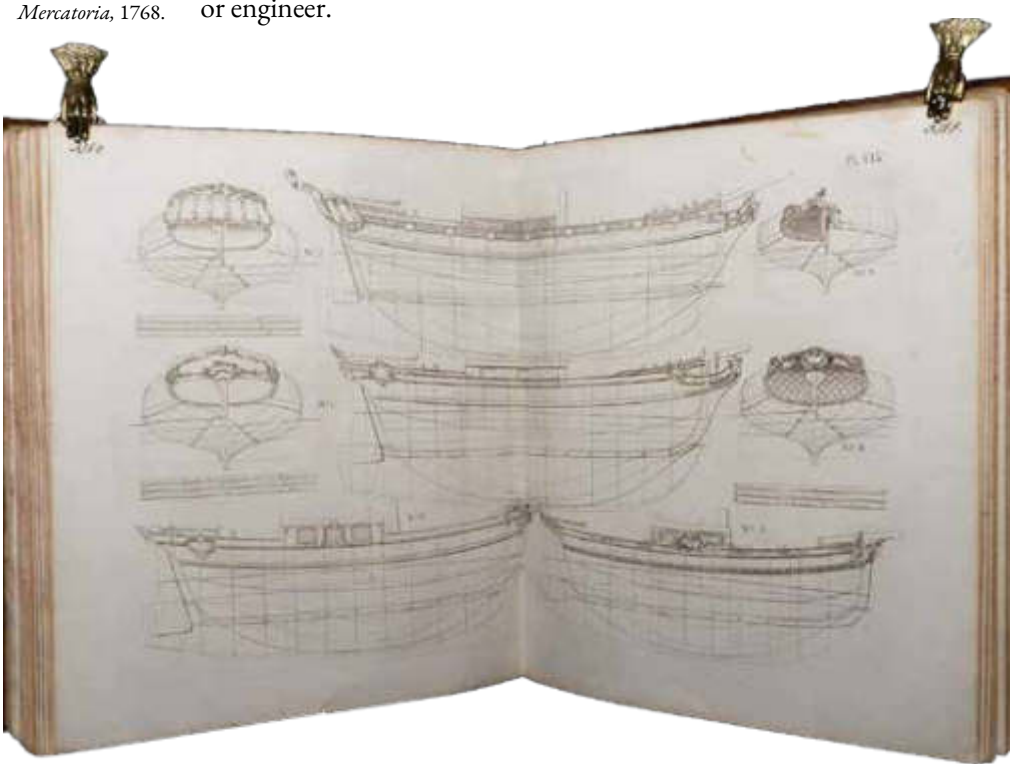
These operations, which had the purpose of checking and predicting the desired results, preceded the construction operations. Nevertheless, it is difficult to identify a pure "design phase" in the modern sense, which should be completely separate from the construction phase. This is also due to the fact that a single figure (the shipwright) managed the entire shipbuilding process. Therefore, although shipbuilding consisted of successive operations concerning the study, creation, and test of each component, the construction process remained unitary and not clearly divisible into two distinct phases (design and construction).

However, shipwrights were not simple craftsmen with rough practical skills. On the contrary, they had to have the ability to manage and organize work, as well as knowledge of shipbuilding. For this reason, they were at the top of the shipyard's hierarchy, with salaries higher (about double) than the other naval craftsmen. Furthermore, in the 16th century, it became necessary for the English Crown to have a fleet that was always active, and the figure of the master shipwright became even more important: the more experienced and capable he was, the better the result obtained in the shipyard. It is no coincidence that in 1605 the status of these expert builders was elevated to a higher rank than the simple craftsman and

[2] B. Siegert, *Cultural Techniques. Grids, Filters, Doors, and Other Articulations of the Real, New York*, Fordham University Press, 2015.

officially recognized as an independent body named the Company of Shipwrights. Even economically, their pay was increased from 1 shilling a day, established in 1570, to 2 shillings and again, in 1605, the "exchequer pay" was introduced, which further increased it by 1 shilling a day.[3]

From the 16th century, shipbuilding increasingly used drawings to intervene *a priori* (before the actual construction) on the final result. Previously, wanting to experiment with a different shape of an element, shipwrights had to make a wooden model of it, but this meant a considerable waste of time and material. The bi-dimensional representation opened the way for drafts and led to a significant evolution for shipbuilding. Indeed, the introduction of paper made it possible to design in a modern sense and consequently favoured the elevation of the figure of the shipwright from a *maker* to a *designer*. However, the process was long and took years of slow integration. Initially, most of the shipbuilders did not feel at all the need to draw the subject of their work and were reluctant to change their methods consolidated in the tradition. It was only in the 18th century that the technical drawing developed in full with the shipbuilding treaties up to the birth of the construction plans. Therefore, the art of shipbuilding became naval science, and the shipwright turned into the naval designer or engineer.

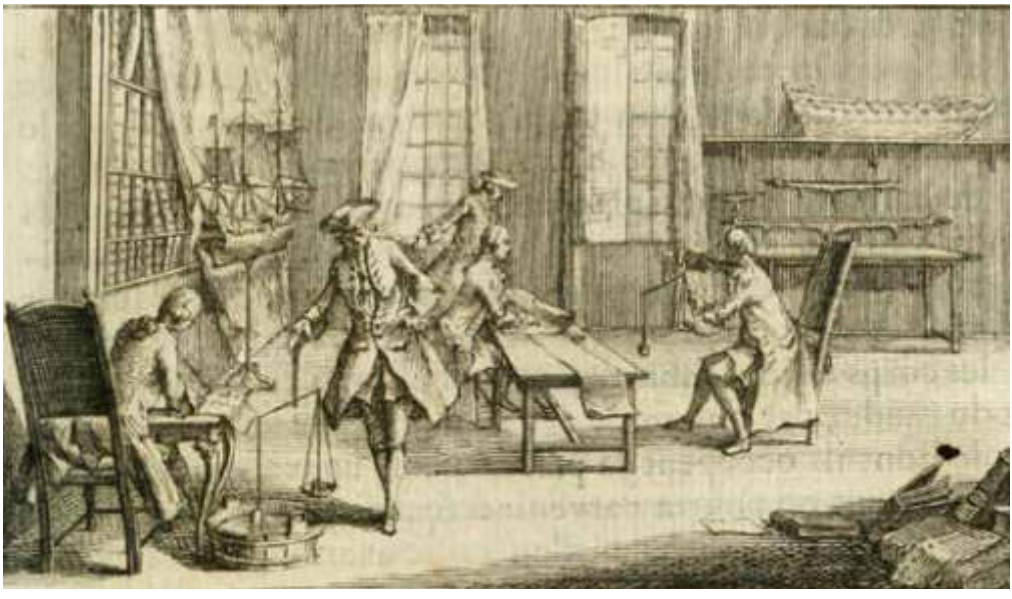


Fredrik Henrik Chapman, *Architectura Navalis Mercatoria,* 1768.

[3] A. WESTCOTT, *Op. cit.*

Matthew Baker

In the slow transformation of the construction process, the figure of Matthew Baker, master carpenter of the English Crown under Elizabeth I, is of fundamental importance. Baker was in fact a precursor and early supporter of the introduction of paper in the design process. With his innovative ideas on naval design, he gave an important contribution to the transformation of the pivotal figure of the shipyards of the time, the shipwright. His knowledge of arithmetic led him to firmly criticize the way of working of the shipwrights of his time; he argued that the rules of proportion and blind trust in experience should be considered insufficient. Baker proposed a new methodology based on the application of mathematics and geometry, which made it possible to predict the likelihood of obtaining optimal results in naval design. Baker argued that the design process, which is the creation of a detailed plan of the vessel, in turn based on mathematical and geometric calculations, necessarily had to precede that of construction, as reported in his compendium *Fragments of Ancient English Shipwrightry* (c. 1588). His purpose was to demonstrate the importance and advantages of applying mathematics and geometry in the study of the shapes of ships. Thanks to this new methodological approach, the design, which until then was inseparable from the practical realization, finds its own identity. One of the most obvious advantages of designing on paper was that it makes the phase of experimentation relatively cheap compared to the past: if previously, to test any modification, the creation of a prototype was necessary, thanks to a calculation, a drawing and an analysis of the results was enough, saving time and precious material. Baker himself used



Duhamel du Monceau, Shipbuilding Lessons, from: *Elemens de l'architecture navale*, 1752, University of Erfurt, Forschungs Library.

his manuscript *Fragments...* to systematically evaluate the variation of some dimensional ratios, experimenting with different drawings of the same midship section, each with a slight difference in the dimensions. During this paradigm shift in their role, shipwrights found a new identity together with a new workplace. They started distancing themselves from the frenetic world of the shipyard and slowly placed their activities in a closed and delimited studio. Another aspect of the shipwright's life radically changed by Baker's method was the teaching. According to tradition, the apprentice shipbuilder's professional training took place directly in shipyards and was mainly based on observation and imitation of the master at work, making shipbuilding a purely practical art based on oral transmission. With the advent of paper, students had a new medium at their disposal, which was the written text. Furthermore, this tool required a different and higher type of education since, to understand the information reported, it was necessary for the apprentice to be not literate and have a basic knowledge of arithmetic and drawing techniques. A subsequent response occurred in administrative terms. English navy officers appreciated the creation of tables and plates. Indeed, not necessarily having practical and technical preparation for shipbuilding, they still had the task of deciding how much and which funding to allocate for the construction of a new ship. The communicative immediacy of the drawings was able to fill those gaps of specialized notions that the Lords of the Navy Board, and further up the Privy Council, could have, allowing a better understanding of the technical details of the construction, the desired performances and the evaluations of the costs, thus allowing more thoughtful decisions. In 1588 senior naval officers sent a letter to the three Royal Master Shipwrights, Phineas Pett, Richard Chapman (1520 – c. 1592) and Baker himself, requesting:

> «The Plats [drafts] of the Ships, Galleasses and Crompsters that were lately determined to be built should be set out fair in Plats and brought to my Lord Admiral that her Majesty may see them.»[4]

In January 1612, the Prince of Wales, Henry Frederick Stuart (1594 – 1612), who wanted to stimulate shipbuilding in Ireland, ordered shipwrights to propose different solutions for new ships and present the illustrative tables of the proposed ship so that His Highness could more easily choose the most suitable ones. Thanks to this procedure, the shipwrights acquired further value as they became the link between the shipyard and the government authority, thus increasing their prestige.

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[4] S.A. JOHNSTON, *Making mathematical practice gentlemen, practitioners and artisans in Elizabethan England*, Degree of Doctor of Philosophy, Cambridge, St John's College, 1994.

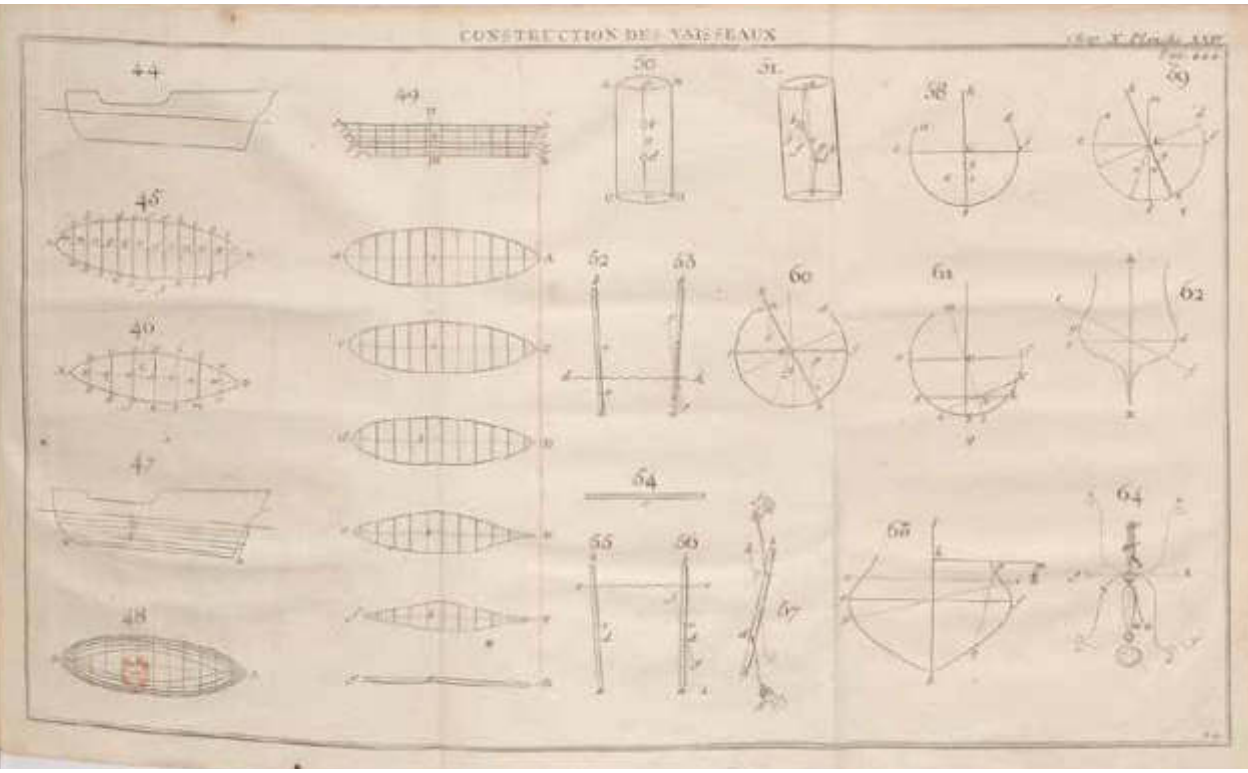
Evolution in the 18th century

Although this revolution started in England, still in the 18th century, few English shipwrights would have been able to translate wooden shapes into the mathematical formula necessary for understanding the geometric problems of a vessel. It is indicative that widespread texts on naval architecture remained almost the same during the century. One of the most common works was *The Ship-builders Assistant: or, some essays towards completing the art of marine architecture...* by William Sutherland (1668 – 1740), published in 1711 and still in use in the first half of the nineteenth century (the last edition was in 1840). At the end of the 18th century, the state of English shipbuilding was still underdeveloped. George Atwood (1745 – 1807) wrote two pamphlets in which he stated that although shipbuilding had reached a high level of precision, there were still many factors that greatly influenced the performance of ships and that had not been studied with the right degree of attention yet. Atwood supported a principle whereby the fundamental elements for the construction of a good ship, such as the hull, the distribution of ballast, the position, and size of the masts and sails, could no longer be entrusted to the experience of the individual shipbuilders. On the contrary, they should have been guided by "principles certain and definite". He remarked that:

> «Whatever may have been the means by which naval architecture receives progressive improvement, it seems to be generally allowed, that the art of constructing vessels has, at the present period, attained to a degree of perfection far surpassing any that has been known to former times, either ancient or modern; yet it is equally certain, that some principles, by which the construction of vessels is materially influenced, still remain to be developed and explained. [...] it must also be acknowledged, that some of the data on which the theory of naval architecture, is founded, being imperfectly known, particularly the laws of the different resistances to the ship's motion, it would be unsafe to rely entirely on deductions a priori for explaining this subject.»[5]

The situation was different in France, where Henri-Louis Duhamel du Monceau (1700 – 1782) continued the tradition of Colbert's successes. He was a botanist who studied carefully different wood drying techniques used for shipbuilding and was appointed navy inspector on the 1st of August 1739. Duhamel was determined to introduce the mathematics in the shipbuilding process, allowing them to calculate and solve stability and manoeuvring issues. In the 1741 he founded the École des ingénieurs

[5] G. Atwood, *A Disquisition on the Stability of Ships. Philosophical Transactions, of the Royal Society of London 1798*, Part II, Peter Elmsly, printer to the Royal Society, London, pp. 306-307.



Henri-Louis Duhamel du Monceau, *Eléments de l'architecture navale, ou traité pratique de la construction des vaisseaux*, Paris, Charles-Antoine Jombert, 1758, plat XXIV.

constructeurs, which was one of the first European shipbuilding schools, made official in the 1765 with the name École des ingénieurs-constructeurs de vaisseaux royaux. In the 18th century, France became the reference point for European shipbuilding, precisely because of its application of the theoretical sciences to shipbuilding techniques. The respect with which European naval powers regarded France can be appreciated in the foreign desire to study and apply French techniques. One such attempt took place explicitly in 1782-4, when the Dutch Republic, on the occasion of its alliance with France during the Fourth Anglo-Dutch War (1780-1784), contacted two French shipwrights, Antoine Groignard (1727 – 1798) and Joseph Marie Blaise Coulomb (1728 – 1803), to request some advice in order to solve some shipbuilding problems.[6]

[6] A. Lemmers, "Shipworm, Hogbacks and Duck's Arses: The influence of William May on Sir Robert Seppings", in *The Mariner's Mirror*, Vol. 99, n. 4, (November 2013), pp. 410-428.

2. *From seascape to "offshore" painters*

Seascapes as an artistic genre

The artistic representation of ships evolved over the centuries in a long process until the identification of a specific genre, that of marine painting. This genre evolved in the 17th century when naval force had become a symbol of power and superiority. Indeed, the European States more interested in overseas power wanted to celebrate themselves through fleets, and they did so through painting. Thus, the importance of fleets meant that the attention of clients, and therefore of artists, shifted from the coasts to the open sea. The novelty was that the subject of these paintings was no more the maritime landscape in general but the fleets that sailed there. Consequently, artists began to populate the arsenals and embark in the fleets, in order to paint the warships in navigation and especially in action during the fighting. In this way, during the century, artists started to populate the spaces that were traditionally the prerogative of shipwrights, carpenters and seamen, from crew to senior officers.

The evolution of this genre originated in the Dutch Republic at the beginning of the century but rapidly spread to the other European maritime powers. In England, sea painting, as well as artists, found a

Alexander the Great explores the depths (BL Royal MS 15 E vi) In: *Talbot Shrewsbury Book*, *Romance of Alexander*, Rouen, c. 1445, preserved at: British Library, London.

Pieter Bruegel, *View of the port of Naples,* c.1563, Galleria Doria Pamphilj, Rome.

new home and, during the following century, this genre underwent an incredible evolution. Following the development of this genre it is possible to see that the degree of detail increased, creating as a whole a large imaginary museum capable of telling the story of shipbuilding through visual support.

The presence of ships in artistic production is a fact that can already be highlighted in the works of ancient civilizations; the Egyptian people carefully depicted their ships, and so did the Greeks and Romans after them and again in the Middle Ages and the following centuries.[7] However, the European tradition of artistic production had mainly focused on religious or mythological subjects, historical events (in particular warfare), including portraits of famous people. Therefore, ships were present in the iconography but without representing the focus of the work, and the artistic production linked to marine landscapes transmitted the value that the sea had for the time, both positively (the sea that brings riches) and negatively (the risks of navigation and enemy attacks).[8] The main subject invariably remained man. In ancient and medieval iconography, this aspect was often unknowingly highlighted by the disproportion between crew and ships. Indeed, the dimensions of men and ships is decidedly distorted, and an enlargement of the human figure is evident. This distortion in proportions can be appreciated, for example, in the *Tolbot Shrewsbury Book* (1444-5), preserved at the British Library in London, in the miniature with the subject of Alexander

[7] L. BASCH, *Le Musée imaginaire de la marine, Athenes, institut hellenique pour la preservation de la tradition nautique*, Athènes, Institut hellénique pour la préservation de la tradition nautique, 1987.

[8] M. ACERRA, "Le paysage maritime en peinture, une vision de terrien*?",* in F. Chauvad-J. Pèret, Rennes (Eds.) *Terres marinesi,* Presses universitaires de Rennes, 2021, pp. 45-8.

the Great exploring the abyss. The centrality of the human characters also emerges in works of art where the naval element is central to the narrative, as in works depicting naval battles or sieges of cities by the sea. An example is the famous Bayeux tapestry of the 11th century, which shows the historic feat of William the Conqueror (1028 – 1087) and his army who invaded England in 1066. In this work, a section is dedicated to the crossing of the Channel (scenes 37, 38 and 39), and the ships are depicted as an essential part of a conquest process; at the same time, however, it is possible to note that the real fulcrum remains the business of the Saxons, and certainly not the ships themselves. More specifically, until the 15th century, it was unlikely to find iconography that reported a ship without the slightest human presence as an independent subject.

The history and evolution of the new artistic genre, which led to an increasing number of ships depicted in the art, are linked to that landscape images. Since the end of the 15h century, a new trend slowly spread, inclined to propose to the user a shift of attention from the characters to the landscapes. In this evolution, the marines became subjects capable of arousing interest in the artist and the commissioner. The human presence gradually moved away from the canvases and the artists, thanks to increasingly realistic proportions combined with a point of view placed at such a distance as to put the human figure in the background. An example is the painting *View of the port of Naples* by Pieter Bruegel (c.1525 – 1569). Ships portrayed were therefore more and more exiled from human presence; however they were still perceived as part of the landscape, and still represented in a certain way the human presence in a natural context. The next step was the affirmation of an interest in ships as the true and central subject of the works, and the success of this genre led to the birth of a sub-category with respect to landscape. In the 17th century, the "marine painting" became a specific artistic genre.[9]

Many of the patrons of these marine paintings were expert navigators, such as admirals or commanders, and sometimes there were also public commissions that required the artist to represent a particular war event or his own fleet to celebrate the naval power achieved. In order to meet the specific requests of these particular and knowledgeable customers, it was necessary for artists to form a solid wealth of knowledge that could not be assimilated by simply remaining on the ground and looking at the boats from afar. Thus, the artist was necessarily led to embark. They found themselves sailing, being part of a crew, momentarily abandoning the safety of their studio, to venture into the waves of the sea and thus be able to make realistic sketches of the sailing ships. Some of them were even

[9] AA.VV., *La peinture de marine du XVIIe au XXe siècle*, Paris, Musée National de la Marine, 2007.

professional sailors, such as Reinier Nooms (c.1623 – 1664), and their knowledge of the vessels was based on a direct experience of life on board.

Embarking was not the only means used by the artists to assimilate the necessary knowledge. In France, the monarchy hired some painters asking them to put their art at the service of the arsenals for the decoration of warships. Some of these artists were also commissioned to make portraits of ships. Among these, one of the best known was Pierre Puget, in the service, who worked at the arsenal of Toulon. He was commissioned not only to make several sketches for the new design of ship decorations but also for existing ships.[10] Although he never made paintings that can actually be defined as "seascapes", Puget can nevertheless be counted among that category of artists, painters and draughtsmen with direct knowledge of the naval world, obtained thanks to the assiduous frequency of the port and the arsenal, or a figure that would have seemed unlikely only half a century earlier.

Artistic production in the Dutch Golden Age

At the end of the 16th century, there was an early emergence of marine painting in the Netherlands, which can therefore be considered the cradle of this genre. This early increase of maritime paintings commission in Dutch artistic production can be seen by analysing the private collections surveyed over several years. These studies have shown that from the 1620s to the second half of the century, landscape paintings increased at the expense of other subjects, especially religious ones and that this trend was common in both Protestant and Catholic circles.[11] That means that in the thriving cities of the Netherlands, artists received many commissions for subjects of seascapes. Trying to understand the reason for this shift in the preference of art subjects means investigating the mentality of people of the time and while remaining in the field of assumptions, plausible reasons can be hypothesized.

Firstly, the client must be taken into account. Indeed, the link between the artist's work and the market for works of art is indissoluble. Artists painted for a living and would not have spent their time creating unsaleable paintings. Even if obvious, this aspect is fundamental as it highlights that if artists began to represent marine scenes and to specialize in this genre, this means that a specific market and an interest actually existed. It is probably no coincidence that at the beginning of the

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[10] M. ACERRA, *Op. cit*.

[11] J.M. MONTIAS, "Works of Art in Seventeenth-Century Amsterdam. An Analysis of Subjects and Attributions", in D. Freedberg-J. de Vries (Eds.), *Art in history. History in art. Studies in Seventeenth-Century Dutch Culture*, Santa Monica, 1991.

century, the Dutch Republic was experiencing its period of maximum splendour, so much so that it was named the Dutch "Gouden Eeuw" (Golden Age). The Dutch Fleet was the main source of income which maintained this economic supremacy. It was, in fact, thanks to trade to the Indian Ocean, Africa, and the American continent that the state was greatly enriched, overcoming and winning the competition of the Spanish Empire. Therefore, the Dutch wealth was a consequence of its navy, naval technological advancement and the management of the routes that led the country to supremacy in global trade.[12] Considering the strong connection that had been created between the country and the sea, it can be assumed that this has stimulated a market of works depicting seascapes, naval battles and overseas enterprises. Likewise, it can be assumed that the State tried to strengthen this relationship, identifying its power in the navy. And so it was that when Dutch shipbuilders proved to be as good as their Mediterranean counterparts, Dutch artists were immortalizing ships on their canvases with a precision for detail that could be considered almost on a par with a photograph.

By investigating the client, it is possible to understand who commissioned and purchased seascape paintings depicting the Dutch fleet. Marine artists had four possible channels to sell their canvases. Paintings could be commissioned by government bodies, purchased by wealthy individuals who specifically required a particular subject, traded through dealers, or sold in art markets.[13] The first channel, a commission by government bodies, illustrates the effort of the Dutch Republic to strengthen its link with the navy. Not only the state-commissioned works of art but there were also cases in which artists joined the crew of various expeditions with the aim of immortalizing events watching the Dutch fleet in action. For instance, the aforementioned Reinier Nooms received a commission for a large canvas from the Chamber of Levantine Trade in Amsterdam, and later other commissions from both the Admiralty and the States General. Jan Theunisz Blanckerhoff (1628 – 1669) received commissions from the Admiralty too, which led him to sail often with the fleet during the Anglo-Dutch wars.

There were also people who could afford private commissions. They could be admirals or commanders who decided to purchase a painting depicting an event or a specific ship as a memorial to a valuable accomplishment. These clients knew very well how the ships that should be depicted in paintings were; consequently, in order to satisfy them, the representation of the subjects had to faithfully reflect reality. Indeed, looking at these paintings, the precision and realism with which the ships

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[12] J. Glete, *La guerra sul mare (1500-1650)*, Bologna, Il Mulino, 2010, pp. 243-244.

[13] D. Remmelt, *Van de Velde & Son. Maritime Painters,* Leiden, Primavera Pers, 2016, pp. 60-61.

are depicted can be noted. The reason is that, even if the viewer is only ideally transported within the scene, the artists' eyes had probably seen the events depicted first-hand. Initially basing their work on ships anchored in ports, with the emergence of this kind of painting artists needed to absorb more information. This necessity pushed many of them far beyond the coasts and ports of Dutch cities. Artists began to embark in order to be able to make realistic sketches of ships in navigation, and some of them were even professional sailors (such as Reinier Nooms). Thus their knowledge of the vessels was undoubtedly reliable. Three artists sailed as officially recognized draughtsmen in the service of the Dutch Republic: Reinier Nooms, Jan Theunisz Blanckerhoff and Willem Van de Velde the Elder.

Artists could also prepare paintings without having a specific commission. They could entrust their works to dealers or take them to art markets (such as the annual fair in Rotterdam) and purchase their paintings to occasional buyers who simply wanted a marine painting in their homes. Indeed, in the Nordic tradition, images were much more present inside houses of private people, and precisely in the 17th century, it was not unusual to find paintings of landscapes or even geographical maps hanging in domestic walls, as shown by the famous example of Jan Vermeer (1632 – 1675) the *Art of painting*. In particular, geographical maps started being appreciated for their pictorial value by the Dutch, who were the first to hang them on their homes' walls.[14]

Detail of: Jan Vermeer, *The Art of Painting,* 1666 - 1668, Kunsthistorisches Museum, Vienna.

[14] S. ALPERS, *Arte del descrivere. Scienza e pittura nel Seicento olandese,* 1st Ed. Chicago, The University of Chicago Press, 1983 (2° Ed. Torino, Bollati Boringhieri, 2018), p. 196.

Jan Porcellis, *Seascape*, c. 1630, The State Hermitage Museum, Saint Petersburg.

Some artists entered into agreements with art-dealers to ensure a purchase. This is the case with Jan Porcellis (1580/84 – 1632), a prolific marine painter who in 1615 signed a contract with Adrian Delen which stipulated that the painter had to paint two marine tablets every week in exchange for a fixed salary.[15] The commissioning of marine paintings increased during the 17th century due to the spread of a sense of bourgeois pride in the sense of possession.[16] The link between artists and the bourgeoisie was very close, so much so that to become part of the guild of artists (known as the Guild of Saint Luke), a person had to belong to this social class.[17]

The connection between art and trade was a typical Dutch phenomenon. In the Netherlands, art was characterized by a technical interest in knowledge of the world and an artisanal aspect that deviated from the lyric and narrative art of the Italian Renaissance, which was highly influential everywhere. Even the Dutch art was influenced by the Italian Renaissance style during the 16th century, but the Dutch objective

[15] P. Coen, *Il mercato dei quadri a Roma nel diciottesimo secolo*, Firenze, Leo S. Olschki Editore, 2010.

[16] S. Alpers, *Op. cit*., p. 172.

[17] D. Remmelt, *Op. cit*, p. 62.

Adam Willaerts, *Ships off a Rocky Coast*, 1621, Mauritshuis, The Hague.

and faithful representation of reality was resumed during the 17th century.[18] At that time, realism characterized Dutch art in general and was appreciated there more than in other parts of Europe. Indeed, it was in the Netherlands that daily life began to find its place in the canvases of artists. This was a consequence of their trust in the "sensible world" (what can be experienced by the senses), which originated from the methods used by Dutch craftsmen during the 17th century. Artists of that time applied all their skills to ensure that their art accurately reflected reality, and marine painters were certainly not excluded from this trend. This refined realism led the marine artists to reproduce as faithfully as possible the ships they saw in ports and coasts of their country.

If the marine painting can be considered the child of the Dutch Republic art, the Haarlem painter Hendrick Cornelisz Vroom (c. 1566 – 1640) is considered its godfather. He is considered the one who continued the artistic legacy of Pieter Bruegel the Elder, evolving landscape art and leading marine painting to become an independent genre. Vroom was one of the firsts to propose a new point of view, which from the typical bird's eye setting was directed downwards, generating a lower horizon line. This allowed to represent ships as realistically as they appeared to the artist's eyes. Vroom made several tapestries depicting naval battles for the well-known Delft art dealer Pieter Spiering van Silvercroon (1595-1652).[19] Thanks to Vroom, this genre began to spread beyond the Dutch Republic, as evidenced by the commission for ten tapestries depicting the

[18] R.W. Unger, "Marine Paintings and the History of Shipbuilding", in Freedberg, David; Jan de Vries (Eds.), *Art in history. History in art. Studies in Seventeenth-Century Dutch Culture*, Santa Monica, The Getty Center Publication Programs, 1991, pp. 75-94.

[19] For a study on Vroom Cf. Russel, Margarita, *Visions of the Sea: Hendrick C. Vroom and the Origins of Dutch Marine Painting*, Leiden, Brill Archive, 1983.

defeat of the Invincible Armada for the English House of Lords. Given his attention to detail, from the hull shapes to the masts and rigging, Vroom can be considered one of the best "chroniclers" of Dutch navy's pioneering era of exploration.[20]

The Hague was the main centre where marine painting flourished, thanks to the work of many skilled artists such as Jan Josephszoon van Goyen (1596 – 1656) and Jan Porcellis, both from Leiden, and again Willem van Diest (c.1600 – c.1678) and Jeronimus van Diest (1631 – c.1687).[21] Amsterdam was an important centre for printing and book production that represented a source of income for many artists who could make the drawings for the engravings or take care of the post-production of the images, such as by colouring the prints. Furthermore, at that time of great naval activity, ships were a winning subject even in the press world.[22] Among the first generation of marine painters active in the early 17th century, Jan Porcellis was the one who introduced one of the first variations in the way of painting. He modified the palette of colours, turning to a more subdued tone, tending to grey or brown. His technique was followed for many years, even after his death, by several painters, including his son Julius Porcellis (c.1610 – 1654), Hendrick Staets (Unk – 1659) and Hendrick van Anthonissen (c.1605 – before 1660). This difference to the first paintings was so evident and characteristic that it led art historians to separate this period from the previous one, calling it the "tonal period". This trend lasted until the middle of the century when the painter Simon de Vlieger (c.1600 – 1653) brought the colours on canvases back to the previous situation. Once again, the change induced a new trend and the artists of this period were called marine painters of the third generation, including Willem Van de Velde the Younger (1633 – 1707).[23]

From the Dutch Republic to England

A consequence of the marine painting diffusion in the Dutch Republic was its introduction in England, where it had great success. The fortune of this genre came after a transition to England thanks to the emigration of many Dutch painters. In particular, the affirmation of the genre at the Stuart court came thanks to two well-known artists, namely the Van de Veldes, father and son, who emigrated to England in 1673. As

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[20] G.S. Keyes, George, "Hendrick and Cornelis Vroom: Addenda", in *Master Drawing,* Vol. 20, No. 2, Summer 1982, p. 118.

[21] W. Liedtke, *Vermeer And The Delft School*, New York, The Metropolitan Museum Of Art, 2001, p. 16.

[22] D. Remmelt, *Op. cit*, p. 40.

[23] *Ibidem*, *Op. cit*, p. 42.

aforementioned, the first half of the 17th century was a moment of maximum splendour for Dutch art in general, paintings were sold and bought in substantial quantities, and even people from lower social classes were involved in the trade. At the time, however, this phenomenon was relatively limited to this area. As evidence of this, John Evelyn (1620 – 1706), an Englishman who went to the Dutch Republic in 1641 during the annual Rotterdam fair, described the experience of that episode in his diary saying:

> «We arrived late at Rotterdam, where was their annual mart or fair, so furnished with pictures (especially landscapes and drolleries, as they call those clownish representations), that I was amazed. [...] Their houses are full of them, and they vend them at their fairs to very great gains.»[24]

From these words, it is clear that in England, it was not at all common to see such a thriving and abundant art market, as it was only the richest who bought works of art, therefore, the nobles and the English court. Furthermore, due to this link between the English nobility and art, with the fall of the monarchy during the English Civil War (1642-1689) there were barely any commissions with a consequent decline of art in general. It was only after the restoration of the monarchy, which took place in 1660, that artistic production began to flourish again, and it was precisely after this period of stagnation that the English art relied heavily on the Dutch example.

Still in the Dutch Republic, Willem Van de Velde the Elder specialized in a very peculiar technique called *penschilderij* (pen painting), in which he mixed the oil paint with the ink. Each artist made preparatory drawings before composing the final painting, and Van de Velde wanted his drawings to be no longer only a preparatory draught but also a finished painting that could be hung on the walls. For this reason, he concentrated on the supports of these drawings, moving from parchment to canvas and working the latter with a preparation that made it look like parchment. This technique allowed him to create his own place in the Amsterdam art market and later evolved, being used by other artists. Nevertheless, it was used only in marine subjects, and although there was no obvious motivation, this technique was very well suited for the complex sailing ships of the time, with all their articulated armament.[25] The pressure to leave the homeland was particularly strong due to the economic crisis caused by the Third Anglo-Dutch War (1672-1674). In 1670, England allied with France (Treaty of Dover), and in 1672, the latter invaded

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[24] J. EVELYN, *The Diary of John Evelyn*, Vol. 1, Edited from the original manuscript by William Bray,Washington & London, M. Walter Dunnet, 1901, p. 18.

[25] D. REMMELT, *Op. cit*, pp. 43-49.

Willem van de Velde (I), *The Battle of Livorno (Leghorn)*, c. 1699, Rijksmuseum, Amsterdam.

the Netherlands with its army. In addition to the territorial pressure produced by the advance of French troops, the Dutch Republic was also suffering a naval blockade by England. At that time of economic depression, there were fewer and fewer art buyers, and the Van de Veldes chose to leave their country and continue their art elsewhere. Although the Republic was at war with England, the choice to migrate to a rival territory is not surprising at all. On the contrary, many other Dutch people had already made the same choice. Geographical proximity was an important aspect, but the massive migration to England was mainly due to the considerable advantages offered by Charles II. Indeed, the king planned to attract foreigners who possessed valuable knowledge of any kind, for example, by promising the freedom to profess their religion and the possibility of immediately becoming denizens of the kingdom of England.[26] In the Dutch Republic, commissions to Van de Velde came in particular from the bourgeois class, and although there was no lack of higher commissions, such as from Leopoldo de' Medici (1617 – 1675), he did not have a fixed patronage that guaranteed him a constant economic gain. When he moved with his son to England, there was no market among the middle class and the need to have a patron among the English nobles became fundamental. The genre of painting that prevailed on the

[26] Denizens: foreigners whose residence is officially recognized. Cf. D. Remmelt, *Op. cit*, p. 130.

island was the portrait, a consequence not surprising given that the main buyers were the nobles. Nevertheless, with the advent of many Dutch painters, the genre of landscapes began to spread and found some success in the English court. An example is the work of the painter and engraver Hendrick Danckerts (1625 – 1680), born in The Hague, who migrated to England in the second half of the 17th century. He made several views of ports for Charles II and almost thirty landscapes for James II.
Another artist who succeeded in England was the well-known Anthony van Dyck (1599 – 1641) so appreciated in England that he needed to hire assistants to be able to answer the demand for paintings.[27] And in that climate of change, the Van de Veldes brought a novelty within the novelty. Their landscapes especially focused on the sight of marines, and thanks to their ability to accurately reproduce ships in their natural element, they brought the genre to be fully established. The favour they met at the English court was mostly due to the interest of the sovereigns, Charles II before and James II after him, in naval affairs.

As aforementioned, the Van de Veldes were not the first to introduce this marine variant of landscape painting in England. The English already had their own tradition of reproducing vessels by images, as evidenced by the manuscript *Anthony Roll* made in the 1640s, depicting 58 warships and enriched with various information on the subject. However, they are documents with practical and strategic purposes where the artistic value, although present, was not the central aspect. Expect from the English tradition, Dutch painters had been commissioned for artworks with a marine subject; as aforementioned, long before the presence of the Van de Veldes, Vroom received a commission for tapestries depicting scenes of naval battles between the English and Spanish fleets and Jan Porcellis travelled to England at the beginning of the 17th century.[28] However, it was with the Van de Veldes (father and son) that the genre spread widely both in the English court and among the rest of the possible patrons. Moreover, it was precisely in the second half of the 17th century that a new type of probable buyers was taking shape in England, that is, a new class of merchants. On the one hand, the re-establishment of the monarchy gave back the main purchasers of artworks. On the other hand, the birth of a new wealthy social class led to a significant growth of the English art trade. In this favourable business climate, the Van de Veldes managed to create their own niche in the market, thanks to their specialization as high-quality navy painters, which shortly after their arrival in the new state led them to receive several commissions from the crown and therefore to be

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[27] A.K. Jr. WHEELOCK, *Dutch Paintings of the Seventeenth Century*, NGA Online Editions, 2014, p. 28.

[28] J. Jr. WALSH, "The Dutch Marine Painters Jan and Julius Porcellis-1 Jan's Early Career", in *The Burlington Magazine*, Vol. 116, No. 860 (Nov., 1974), pp. 653-662.

Anonymous author, Netherlandish School, *Ships Laid Up in the Medway,* c. 1675, National Maritime Museum, Greenwich, London.

official court painters to Charles II.[29] It was Van de Velde the Younger in particular who greatly influenced English art, probably because he lived and worked in England for thirty-five years. His ability to reproduce ships and the surrounding landscape in detail allowed him to change the atmosphere of his paintings. Indeed, from the views of vessels during quiet navigations in a calm sea, typical of the Dutch period, he began to depict more lively scenes, generally of ships in danger due to some terrible storm. Probably this change of composition was due to a different English taste, which, it should not be forgotten, slowly evolved to the dramatic and energetic images represented in the course of Romanticism at the end of the 18th century.

England, like the Dutch Republic previously, had been experiencing a period of growth and development of the fleet which led it to become a formidable naval power. Thus, also in the English context it is possible to see a parallelism between the growth of the fame of the English fleet and the growth of the demand for marine paintings. And again, it was during the 18th century, when the British Empire reached the maximum of naval power, that the English painters embraced the Dutch teaching and started

[29] D. Remmelt, *Op. cit*, pp. 141-158.

their own production of marine paintings, showing English fleet in all its power.

The skills developed by Dutch painters were the key to the success of marine painting. The evidence of this fact led English production not to underestimate Dutch art. Indeed, while forming their own marine tradition, English artists relied on the Dutch example. They interpreted Dutch production as a school to learn from, so it is not surprising to find Dutch ships in English marine paintings.[30] And when the Royal Academy was founded, in 1768 under the reign of George III, the work of those artists was taken as an example for the teachings of marine painting, both for technical details of ships and the rendering of the natural element that surrounded them.[31] Even one of the greatest exponents of English genre painting, William Turner (1775 – 1851) was greatly influenced by it.[32]

In England, as it had been in the Dutch Republic, artists could receive commissions from the governing bodies or be requested by naval officers, who, to remember and commemorate their success at sea, often had paintings of their ships and naval battles they had fought and won. These commissions provided a constant source of income for many artists such as Nicholas Pocock (1740 – 1821), marine painter to George III, or John Thomas Serres (1759 – 1825), official marine painter for the Admiralty and Marine Painter to George II and the Duke of Clarence. The fact that seamen requested this type of painting is perhaps not so surprising but, interestingly, they were not the only ones to buy them. Indeed, following once again in the footsteps of what had previously happened in the Dutch Republic, the entrepreneur artists made marine paintings without having any commission and then sold their works to occasional buyers. The reasons that pushed people outside the maritime activity to buy this type of image can be many, however, it should be remembered that during the 18th century, the fortune and economic stability of England in general undoubtedly linked to naval strength. The role of the English fleet was of fundamental importance for the entire country.

This aspect had to be made evident to public opinion. Anyone, even those who did not care at all about questions concerning the navy, should know that it was the fleet that guaranteed stability to the state and all its citizens. The English crown aimed to make the navy the symbol of strength, and therefore the English had to recognize themselves in it and be proud of it. The most effective channel for carrying out this pro-marine propaganda turned out to be artistic production. The painters of the

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[30] D. CORDINGLY, *Marine Painting in England 1700-1900*, London, Studio Vista, 1974.

[31] N. TRACY, *Britannia's Palette: The Arts of Naval Victory*, Montreal, McGill-Queen's University Press, 2007, p. 18.

[32] G. REYNOLDS, "Turner And Dutch Marine Painting", in Netherlands Yearbook For History Of Art, Vol. 21, 1970, pp. 383-390.

Nicholas Pocock, *The Battle of Frigate Bay, 26 January 1782*, 1784, National Maritime Museum, Greenwich.

English "wooden world" had such a social importance that they became of national interest. Their work was not only supported by the Court patronage but also by many nobles and important shipping companies such as the East India Company, which with their countless commissions guaranteed artists' stability and a social status that rose from the simple craftsman. Moreover, thanks to these important commissions, many artists were invested with particular titles such as "Engraver of Marine Subjects to the King".[33]

Peintres pour les mers du roi

Another centre of diffusion of the marine genre, albeit with a strong personality and linked more to historical and dreamlike painting, was France, the third great naval power at stake in the political chessboard of the century. Indeed, under the reign of Louis XIV, France had become one of the main naval power and the king's pride. This great result had been possible particularly thanks to the efforts of Minister Colbert. And although in France the migration of Dutch artists was not as evident and significant as in England, the genre of Dutch marine paintings arrived on French territory. For example, in 1665 a painting depicting the view of the port of Amsterdam was commissioned to one of the most skilled Dutch marine painters, Ludolf Backhuysen, (1631 – 1708) for Hugues de Lionne Marquis de Berny (1611 – 1671), the minister of Louis XIV who signed the Treaty of Breda (1667) which put an end to the Second Anglo-Dutch War.[34]

French marine painting immediately showed its strong identity by linking the representation of naval battles to the tradition of the *peinture*

[33] N. Tracy, *Op. cit.*, p. 5.

[34] A.K. Jr. Wheelock, *Op. cit.,* pp. 76-77.

Claude Lorrain, *French Port de mer au soleil couchant*, 1639, Louvre Museum, Paris.

d'histoire. Paintings of this genre aimed to enhance the value of combat, and those commissioned by the Sun King had to make the monarch appear as the absolute leader of war as well as the centrepiece of the scene. Thus, painting became part of the propaganda carried out by Louis XIV to raise his figure to an almost divine level. French painting influenced the English production of naval battles paintings, as proved by the Flemish tapestries at the Blenheim Palace requested in the French style by the Duke of Marlborough (1650 – 1722), to commemorate the victory over the French in the war of Spanish succession in the early 18h century.[35] The Académie royale de peinture et de sculpture was founded in 1648, much earlier than in England, and the academic teachings linked to a classical tradition were at odds with the values pursued by Dutch realism. Indeed, although French art looked to nature as a source of inspiration, the specially designed composition returned nature in an idealized and not purely realistic form. A famous example is the work of Claude Gelle known as Le Lorrain (1600 – 1682) in which although the attention paid to detail both in the natural elements and in the ships that often populate his canvases, the harmony of the compositions and the calm atmosphere makes his marine paintings seem like enchanted landscapes rather than realistic.[36]

Colbert's efforts to make France equal to other European naval powers did not stop at the organization of ports and arsenals, and it

[35] N. TRACY, *Op. cit.*, p. 14.

[36] M. RUSSEL, V*isions of the Sea: Hendrick C. Vroom and the Origins of Dutch Marine Painting*, Leiden, Brill Archive, 1983.

Jan Karel Donatus Van Beecq, *Bombardement de Chio par Duquesne*, 23 juillet 1681, Musée national de la Marine, Paris.

became necessary to find skilled artists able to represent and immortalize the glories of the Marine Royal on the seas. The recognized painters who could boast of the title of "peintres pour les mers du roi" were: the Genoese Maria Francesco Borzone (1625 – 1679), Jean-Baptiste de La Rose, who originated from Marseille, Pierre Jacob Guéroult du Pas (1654 – Unk) from Toulon, and the Dutch Jan Karel Donatus van Beecq (1638 – 1722), already active in England before moving to France. In addition, the Flemish Matthieu van Plattenberg (1608 – 1660) participated in the foundation of the Royal Academy of France and, although he died before the French fleet developed, he was a very skilled marine painter and therefore obtained the same title.[37] Unlike what was happening in England, the great heterogeneity of the provenance of these artists shows that Northern European art was not the only influencer of French marine painting.

Among these artists, De La Rose is perhaps the best known. His fortune as a painter led him to get very close to the world of the navy. In 1663, he entered the service of the crown and gained the with the title of *maître peintre entretenu.* He was in charge of supervising the direction of all the works carried out in the port of Toulon concerning the decoration on French warships. He also received many commissions for marine paintings from various nobles of the French court; in particular he made two works for the Duke de Beaufort, six for the Duke de Lesdiguieres, and others for Colbert, Seignelay, d'Estrees, de Tourvelille, as well as for the cardinals de Bouillon and de Vendome.[38] The art of marine painting continued over the years also in France, developing its own tradition, which was crowned in 1830 with the birth of the title *Peintre de la Marine* issued by the French ministry of defence.

[37] D. Lacroix-Lintner, "Les peintres «pour les mers» de Louis XIV", in *124-Sorbonne*, Paris, Carnet de l'École Doctorale d'Histoire de l'Art et Archéologie, 2014.

[38] P. Burke, *Testimoni oculari*, 1st Ed. London, Reaction Books, 2001 (Tr. It. Roma, Carocci editore, 2020), pp. 69-70.

Conclusions

In light of what has been said, some conclusions can be analysed on different levels. The first level concerns the study of ship decoration design in the 17th century, which is the subject of the present work. Nevertheless, this topic was a case study, which was identified among many possible others, to understand if and how iconography could be a significant research tool as well as a means of communication. Furthermore, some considerations have to be made about the role of the design in historic research whose main topic was about the past. This has to be made in order to express what are the implications and thus, what advancement the research aims to have for the modern discipline.

In the previous page: Nicolaes Loockemans, Michiel de Ruyter's goblet, 1667, Rijksmuseum, Amsterdam.

Design of 17th-century ship decoration

The 17th century proved to be a time of a strict correlation between ship design and iconography. The mutual influence was expressed in the creation of many works of art by the hands of artists as well as the first attempts to create technical drawings and the construction of sailing masterpieces. The age-old habit of decorating ships that was handed down over the centuries slowly lost its mystical value, becoming predominantly an artistic display of wealth and power, with a consequent transformation of the intrinsic meaning of decorations. In this evolution, the 17th century represents the decorative climax of warships, which had never been so intensely decorated and never were in the centuries to come. Indeed, in previous centuries, the ornamental apparatus was generally limited to painting hulls, while the presence of three-dimensional sculptures was decidedly limited. On the other hand, during the 18th century, there was a trend opposite to that of the 17th century, which led to a drastic reduction of the decorative apparatus in favour of simple coloured lines painted on hulls that became widespread towards the end of the century. From the 18th century onwards, warships reached an aesthetic style that could be defined as modern, as it is still shared today, stripped of any artistic charm.

By analysing the historical and political context, it is possible to understand the reasons why this singular union between art and shipbuilding intensified precisely in the 17th century. Firstly, it can

be taken into consideration that decoration was decidedly expensive, both for first-rates and lower-rates. Indeed, the material used was of high quality and the work of the numerous artists needed to create the copious sculptures, different and personalized for every ship, was also expensive. Although it may seem simply a pecuniary "disadvantage" of the sumptuous decorations, the economic aspect reveals a lot about the determination and will that underlie these choices. The substantial economic effort required highlights the need for considerable funding from "the client" commissioning the ship. Indeed, only a state, especially an absolute monarchy, could actually provide the necessary economic resources, and sometimes the state budget was not even sufficient to fully cover these exorbitant expenses, as demonstrated by the *Sovereign of the Seas* of Charles I. This consideration of the economic side is fundamental for it helps to formulate a more precise question; it is important to ask not only why warships were decorated to such an extent in the 17th century but also why the sovereigns were interested in the aesthetics of ships only from that moment on, and not before. The reason lies in the fact that only from the 17th century onwards did states begin to own permanent "state marines", while up to that moment, they had relied on private fleets, rented or requisitioned when it was necessary. Therefore, it was only since warships became state-owned tools that real interest from rulers could develop. Moreover, the consolidation of the centralized power of states led to conflicts increasingly linked to a growing "sensitivity to identity" (what will become nationalist sentiment in the 19th century) and the desire for supremacy was no longer only understood as a territorial conquest, but also became an ideological phenomenon. Thus, sovereigns' power was becoming an increasingly symbolic aspect that had to be transmitted in every possible way to the rest of the world. It followed that, in an era in which major naval battles were fought, ships of the line became a perfect instrument of political propaganda. Consequently, this generated a push to use ornaments in abundance to display the power and wealth of kingdoms, and art (decoration included) became the ideal medium through which to send the message on that new vehicle which the ship of the line was.

In the 18th century, the aesthetic pomp of warships was decreasing. The development of the technique led to an increasing engineering design of hulls and every other construction element. The new scientific approach distanced itself from tradition, and the art of shipbuilding finally became a science. During this evolution, aesthetics lost importance, becoming a decidedly secondary aspect. From the new point of view, power and speed were the most important qualities in warships. Keeping in parallel with the political condition, the new approach coincided with the decline of the great absolute monarchies, such as Spain, France and England. The

new century led to political apparatuses, in which the important aspect was no longer to convey the greatness of the kingdoms but to practically demonstrate military and economic superiority. Wars were predominantly economic, and victory was for the strongest and not the "best". In particular, in the Franco-British wars of the time, it could be said that whoever could arm more ships probably won. In such a pragmatic context, the aesthetic display of decorative opulence was no longer perceived as positive but, on the contrary, as a waste of resources. The power game was no longer between monarchs who aimed to amaze their competitors by showing how much they could afford but between "modern" states which operationally showed their effective power on battlefields.

The 17th-century ship decoration also proved to have a double identity. One concerned all those aspects common to the European naval powers sharing the same desire to prove their magnificence through warships. The widespread general arrangement, the frequent use of similar themes and subjects, as well as a similar aesthetic taste made it possible to perceive the general characteristics which made the decoration of the century recognisable. At the same time, it also became evident that despite these common aspects, each navy had its own features and peculiarity, mainly due to the political and social situation, which expressed the identity of a state.

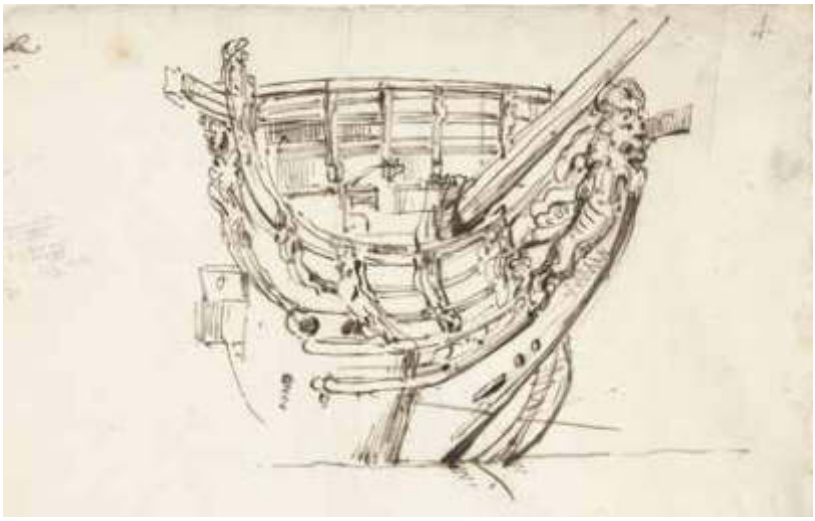
For what concern the practical aspect of the design of decorations, the study of *Vasa* has allowed to analysed ornaments and sculptures together with the context. The study of the interaction between decorations and the ship's structure, the possible purpose of sculptures, as well as their components, allowed the formulation of a possible timing and process plan for the construction. Thus, it has made it possible to understand all those technical aspects of decoration that iconography was not expressing, giving a major comprehension of the ship decoration design. Furthermore, a comparison between naval iconography and a real example also highlighted aspects of *Vasa* that can be considered as "common features" and which are instead peculiar. Interestingly, much of the evidence has shown that decoration was not just a final addition to embellish a warship, as the icing on the cake. Instead, it was clearly a part that had to be thought and designed together with the rest of the ship, as it required spaces, supports, and a previous preparation of all the elements intended to host the single decorative parts. Even if the main artist called to design the decoration programme was only drawing a "dress" for a ship, all the minor artists charged with realizing the decoration had to read those drawings and translate them into real pieces designed for the hull. In order to do that, as *Vasa* proves, a strict contact with carpenters and shipwrights was necessary, for the reason that they had to arrange the structural elements for decoration.

Iconography as research tool and means of communication for design's history

The work carried out has not only purely historical purposes, linked to the analysis and understanding of the complex past world. It is also proposed as a practical study tool and test of a research method based on the use of iconography for the history of design. Indeed, the specific case study was used to analyse a method, which could be applied to different and even more recent realities.In this work, iconography has been used as visual historical evidence to acquire information about the past and as bi-dimensional image realized during the research to express and communicate concepts and technical details. It has proved to be a valid source for both these uses and this has been possible thanks to the various forms that iconography can have.

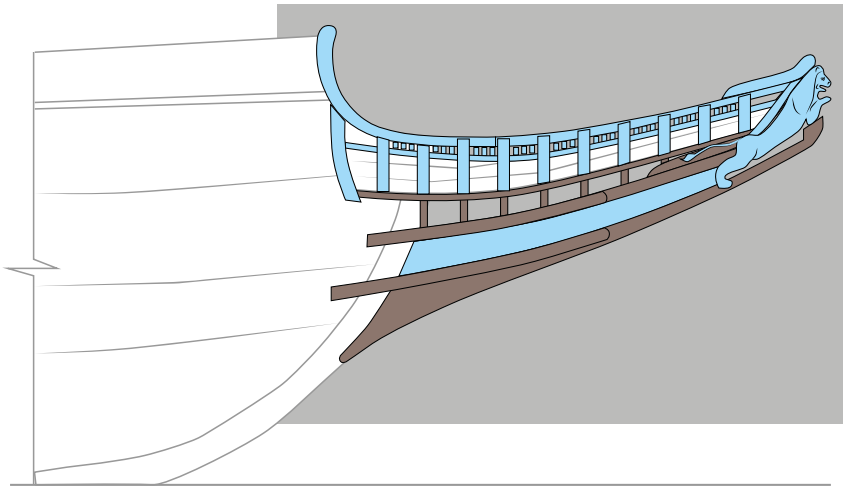
Paintings, drawings, prints, and all the visual supports of the past are historical pieces of evidence able to teach something about former times. Nevertheless, the use of iconography for this purpose attracts critics for its non-objective aspect. Indeed, its interpretation can be influenced by many factors, the viewers' point of view included. Even so, considering this problem, it is possible to acquire precious information through iconography. The way used in the present work to solve the problem of subjectivity is not to focus on a single image but to use the comparison between many iconographical sources with the same common denominator. That was the period, that is, the 17th century, while artists and geographical origins were different. To some extent, this process allows one to go beyond the artist's vision, the client's requests and the social contexts, making it possible to understand what elements remain present in all the sources and so focusing on those that are more realistic and reliable. Thus, studying the context of images can be useful not only to identify an artistic style but also to increase the knowledge of the past. Indeed, iconography is a witness to that slow process which has affected the evolution of shipbuilding, showing significant steps such as the introduction of new construction techniques, new instruments related to propulsion, and the development of technology until the appearance of steam propulsion and iron construction, at the dawn of the contemporary age.

Iconography also includes pictures, graphic drawings, and everything that is visual support created during the study of a subject. In the research, these supports have been used to show technical features, and proved to be an effective tool to communicate and transmit information concerning technical details. The application of digital technologies to cultural heritage through the development of multimedia products can have relevant cultural and scientific implications having a didactic and dissemination value. New iconographic sources made through



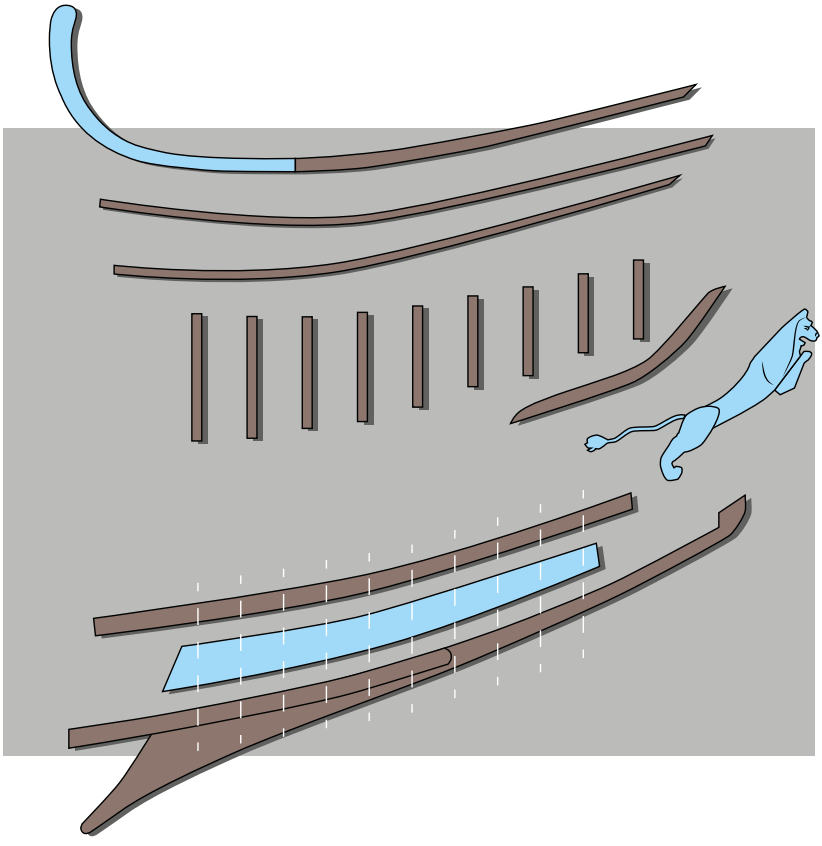
Willem van de Velde (II), *Bow of the English ship*, 1666 - 1707, Rijksmuseum, Amsterdam.

Picture of *Vasa*'s bow made and processed by the author.



Graphic drawing of *Vasa*'s beakhead made by the author during the analysis of this section.

digital tools, and historical images can be combined, providing proofs and explanations through the same kind of support. The iconographic compendium created during the research is composed of paintings and drawings from the 17th century as well as the photographic collection made by the author during the period at the Vasa Museum. This tool is useful as background for historical comprehension and to create the basis for digital reconstruction and interpretation. As demonstrated by historical iconography, there is also a practical aspect linked to the world of education. Iconography can help people who want to approach the study of naval and nautical history, being a valid aid for understanding and clarifying the technical and constructive evolution. In particular, it concerns some aspects which, for reasons of temporal and lexical distance, appear as barriers separating the current world from the past. The immediacy of the images makes the information more understandable, allowing the disclosure of technical information in a broader sense, involving the interest of external spectators. Interpreting iconographic sources and creating new images can become a method for learning more about the past and disseminating knowledge. In particular, it is valuable for those events relating to an era in which literature was not yet adequate to express its interpretative and narration skills of the history of shipbuilding. Therefore, also in the design discipline, iconography is useful for classifying, interpreting, and describing what happened in the



Graphic drawing of *Vasa*'s beakhead main components made by the author during the analysis of this section.

past.

As emerged in the present work, iconography is not an addition to the text but becomes part of it. It is a complementary and functional part since it can display concepts and ideas thanks to its intrinsic communicative intentionality. It allows the comprehension of a wider public than a description in a text does for it does not have the limitations of languages and technical words. Iconography is an effective visual text.

Advancement for the design discipline

Finally, it is necessary to answer a previous question expressed already in the introduction: what is the progress that this research produces for the design discipline? The original wish was to prove that a designer can be valuable not only as an expert in the creation of something new, but also as a figure able to propose a new point of view in other disciplines, and particularly in the study of design history. Indeed, interdisciplinarity is a key factor of the present work. But has this fact proved to be true? According to the personal opinion of the author, the answer is positive. Indeed, a designer can offer not only technical skills, but also a new perspective, which can create new opportunities if shared with other disciplines. Some branches of knowledge are already taking advantage of designers' skills. For example, the collaboration between design and medical science has found its way into specializing in ergonomic products. Nevertheless, history has always been a distant discipline, probably because it is not so evident what improvement the design could offer. It is true that nowadays, more and more museums and other cultural realities are using digital support, relying on people with technical competencies for specific projects. Of course, designers can offer skills uncommon among experts in other fields, and the use of digital tools and programs for 2D and 3D graphic processing has shown its importance for the clarification and communication of technical aspects. As previously mentioned, these skills can enhance concepts and information, becoming valuable tools not only in the design world but also in history and other disciplines.

Nevertheless, in these cases, the designer is perceived more as a "tool" used to satisfy the request of other experts. Instead, what this work wants to prove is that designers could propose themselves not only as technicians but also as expert researchers able to give an added value to the study of the past through their knowledge. The interaction between these two disciplines, history and design, has proved to be a valid form for this study. Indeed, the attention focused on the technical process regarding the design and the construction of ship decoration, which is a subject not deeply studied yet and, for this reason, offers ample opportunities for further researches.

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