

VETTOR FAUSTO (1490-1546), PROFESSOR OF GREEK AND A NAVAL  
ARCHITECT: A NEW LIGHT ON THE 16<sup>TH</sup>-CENTURY MANUSCRIPT *MISURE DI  
VASCELLI ETC. DI...PROTO DELL'ARSENALE DI VENETIA*

A Thesis

by

LILIA CAMPANA

Submitted to the Office of Graduate Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of  
MASTER OF ARTS

December 2010

Major Subject: Anthropology

VETTOR FAUSTO (1490-1546), PROFESSOR OF GREEK AND A NAVAL  
ARCHITECT: A NEW LIGHT ON THE 16<sup>TH</sup>-CENTURY MANUSCRIPT *MISURE DI  
VASCELLI ETC. DI...PROTO DELL'ARSENALE DI VENETIA*

A Thesis

by

LILIA CAMPANA

Submitted to the Office of Graduate Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

Approved by:

Chair of Committee,	Filipe Vieira de Castro
Committee Members,	Cemalettin Mustafa Pulak
	Vivian Paul
Head of Department,	Donny L. Hamilton

December 2010

Major Subject: Anthropology

## ABSTRACT

Vettor Fausto (1490-1546), Professor of Greek and a Naval Architect: A New Light on the 16<sup>th</sup>-century Manuscript *Misure di vascelli etc. di...proto dell'Arsenale di Venetia*.

(December 2010)

Lilia Campana, B.A., University of Urbino

Chair of Advisory Committee: Dr. Filipe Vieira de Castro

This thesis investigates the significant role that the Venetian humanist Vettor Fausto (1490-1546), professor of Greek at the School of Saint Mark, played during the first half of the 16<sup>th</sup> century in Venetian naval architecture. Early in the 16<sup>th</sup> century, the maritime power of Venice was seriously threatened by the Ottoman Sultan Suleiman II in the East and by the Holy Roman Emperor Charles V in the West. In order to regain its naval power in the Mediterranean, the Republic of Venice strongly encouraged Venetian shipwrights to submit new designs for war galleys. The undisputed founder and champion of this naval program was not a skilled shipwright but a young professor of Greek in the School of Saint Mark named Vettor Fausto, who in the heat of this renewal programme, proposed “marine architecture” as a new *scientia*.

In 1529, Vettor Fausto built a *quinqueremis* whose design, he claimed, was based upon the quinquereme “used by the Romans during their wars” and that he had derived the shipbuilding proportions “from the most ancient Greek manuscripts.” The recovery of Classical traditions resulted in major changes in many fields. It included shipbuilding

practices as well, especially after Fausto introduced in the Venetian Arsenal a new *scientia*, that of “marine architecture”, in opposition to the *fabrilis peritia*, the empirical shipbuilding practice.

This work examines several Renaissance sources and archival material in order to illuminate the technical features and the design of Fausto’s quinquere. Based on the study of the anonymous 16<sup>th</sup>-century Venetian manuscript *Misure di vascelli etc. di...proto dell’Arsenale di Venetia* from the State Archive of Venice, this thesis presents a general overview of Fausto’s life and his cultural background in order to better understand the humanistic foundations that led him to propose the construction of the quinquere. Also presented in this thesis is a theoretical reconstruction of Fausto’s quinquere and the suggestion that the shipbuilding instructions contained in the anonymous manuscript are connected to the work of Fausto in the Venetian Arsenal.

To Alberta and Gastone Campana

“...for parents can provide their children with no more lasting resources,  
no more dependable protection in life than instruction.”

## ACKNOWLEDGEMENTS

It is a pleasure to acknowledge the support of the many people who allowed me to research and write this thesis. I am grateful to the Institute of Nautical Archaeology for providing me the opportunity to advance my knowledge of Renaissance Venetian naval architecture by studying original shipbuilding manuscripts in various libraries and archives. I am especially thankful to all the Board of Directors, founders, sponsors, and donors of the Institute of Nautical Archaeology for their unremitting, generous funding, and for believing in my project and my ability to complete it. My heartfelt gratitude and appreciation goes to the Faculty of the Nautical Archaeology Program for the numerous grants that allowed me to conduct the research and to present it at various conferences and symposia. My sincere appreciation is extended to the Department of Anthropology at Texas A&M University for the many travel grants, and to the ProMare Foundation Inc. for their financial assistance in 2008.

I am most grateful to the members of my thesis committee: Drs. Filipe Castro, Cemal Pulak, and Vivian Paul. Dr. Filipe Castro entrusted me with the position of being his assistant from 2007 to 2009 and work with graduate students in the J. Richard Steffy Reconstruction Ship Laboratory. The stimulating discussions on ship design and ship lines drawings have been a rewarding experience that enriched me both professionally and personally. Dr. Cemal Pulak has kindly and generously shared his extensive knowledge of shipbuilding and nautical archaeology with me, providing me with constructive criticism and brilliant insights. As his assistant from 2009 until the present

time, I had the great opportunity to work with Dr. Pulak in what I consider more than simply my intellectual home, the Old World Laboratory. Dr. Pulak's various projects and challenging research enabled me to improve my knowledge in ways I never anticipated. For being an inspiration for what a scholarly researcher should be and for forcing me to be always constructively critical in my approach to research, I would like to thank him with some words I found on the back of a rare printed book in the Marciana Library in Venice, presumably written by a student: "Excellent is the teacher who, by teaching, incites in his pupils a great desire to learn." Dr. Vivian Paul shared with me her knowledge and huge bibliography in her History of Medieval Architecture class. Her lectures broadened my perspective on medieval design and construction methods, and offered me a closer insight into the world of craftsmanship, which enabled me to better understand the strict relationship espoused between a mason building a cathedral, and a shipwright building a ship. To my committee members, thank you for all of your guidance, support, and caring assistance throughout the course of this research.

This work could have not been possible without Mauro Bondioli, who is one of the most prominent and unsurpassed researchers in the field of Venetian shipbuilding manuscripts. Mauro Bondioli introduced me to archival research when I first met him in 2007, and provided me with a wealth of information during 2007-2008. He kindly proposed the topic of the present study as my thesis subject, and brought to my attention the anonymous 16<sup>th</sup>-century manuscript *Misure di vascelli etc. di...proto dell'Arsenale di Venetia* as a document possibly recording measurements of Fausto's ships. The technical aspects of Fausto's quinquereme were studied under his patient guidance and

unfailing assistance. Working on Renaissance shipbuilding manuscripts represents an intriguing challenge for the mind and a great pleasure for the spirit, but it requires, so to speak, the attitude and the patience of the pioneer. Mauro Bondioli greatly facilitated my work by guiding me thorough the cryptic texts of shipbuilding manuscripts. For all the expertise he shared with immense generosity and in friendship, I am most grateful.

The staff of the Marciana Library and of the State Archive in Venice, where much of my thesis was written, deserves my special thanks. From the State Archive, I owe my sincere gratitude to the Director Dr. Raffaele Santoro, to the Vice-director Dr. Piero Scarpa, and to the Director of the Manuscript Room Dr. Michela Dal Borgo for facilitating so much of my work. Dr. Alessandra Sambo has been helpful many times, as well as Drs. Paola Benussi, Alessandra Schiavon, Franco Rossi, and Edoardo Giuffrida. The Department of Conservation, Restoration, and Scanning has been simply wonderful, always willing to grant any request in reasonable time. Special thanks go to the Director Giovanni Caniato, Olivo Bondesan, and Ciro Esposito. I also wish to thank the ladies of the Department of Photoreproduction for their kindness and support. Many thanks are due also to all the archivists and the personnel at the manuscript distribution desk. From the Marciana Library – probably the most evocative place in Venice where Renaissance culture truly revives – I would like to thank Dr. Maria Luisa Corsa from the Department of Rare Early Printed Books, and Dr. Susy Marcon from the Department of Manuscripts.

I have presented the preliminary results of this project at various conferences and I have benefitted from the stimulating discussions and comments audiences offered me. Among these scholars, I owe a special thanks to Drs. Renzo Baldasso, Federica



Ciccolella, Pamela Smith, and Stephen Johnston. I also want to extend my gratitude to all my professors of the Nautical Archaeology Program at Texas A&M University who have encouraged me to pursue archival research for the past four years and contributed so much to my expertise in investigating manuscripts. My professors and fellow graduate students at the Nautical Archaeology Program, my friends in Italy and in College Station have shared, in one way or another, the long process of researching and writing this thesis.

My most heartfelt and profound gratitude goes to my wonderful parents and to my brother Manuel for their warm support, unfailing encouragement, and unconditional love throughout my life in all of my pursuits. As far back as I can remember, they instilled in me their love and passion for books; Cicero was indeed correct in saying: “What happy family books make!” For being the pillars of my formative years and, most of all, for contributing so much to become the person I am today, I could not find for my parents better words than those of the humanist Vergerio I wrote in the dedication. This thesis is dedicated to them.

A last word of gratitude goes to my fellow colleagues Ryan Lee, and particularly to Chris Cartellone, for carefully and patiently editing this thesis.

## NOMENCLATURE

ASVe	Archivio di Stato di Venezia
BAV	Biblioteca Apostolica Vaticana, Vatican City
BCVe	Biblioteca del Museo Civico Correr, Venice
BNM	Biblioteca Nazionale Marciana, Venice
BNN	Biblioteca Nazionale di Napoli
BNP	Bibliothèque Nationale de Paris
BLL	British Library, London
LAM	Libreria Angelo Mai, Bergamo
ONB	Österreichische Nationalbibliothek, Vienna
ULG	University Library of Glasgow
Ms./Mss.	Manuscript/manuscripts
Fol./fols.	Folio/folios
Reg.	Register ( <i>registro</i> )
Env.	Envelope ( <i>busta</i> )
r	Recto (in manuscripts)
v	Verso (in manuscripts)
a	Recto (in rare printed editions)
b	Verso (in rare printed editions)
[...]	Omission in the text
[ ]	Integration/explanation by the author

## TABLE OF CONTENTS

	Page
ABSTRACT .....	iii
DEDICATION .....	v
ACKNOWLEDGEMENTS .....	vi
NOMENCLATURE .....	x
TABLE OF CONTENTS .....	xi
LIST OF FIGURES .....	xiii
LIST OF TABLES .....	xv
CHAPTER	
I INTRODUCTION .....	1
II VETTOR FAUSTO (1490-1546): NAVAL ARCHITECT AND PROFESSOR OF GREEK .....	16
Introduction .....	16
<i>Ratio</i> and <i>Virtus</i> : Fausto as a Metaphor of the Human Being.....	21
The <i>Studia Humanitatis</i> : Fausto at the School of Saint Mark and Early Literary Activity (1506-1512) .....	35
From the <i>Homo Viator</i> to the <i>Homo Comprehensor</i> : The Quest for Knowledge (1512-1518) .....	57
Teaching Greek at the School of Saint Mark (1518-1546) .....	73
The Proposal of Building the Quinquereme (1525) .....	80
The Naval Career of Fausto's Quinquereme .....	96
III THE <i>MARINA ARCHITECTURA</i> .....	107
Introduction .....	107
The <i>Navium Ratio</i> .....	109
From the <i>Fabrilis Peritia</i> to the <i>Architecturae Professio</i> .....	114

CHAPTER	Page
IV THE QUINQUEREME .....	123
Introduction .....	123
Rowing Arrangement, Rowing System, and Steering Mechanism	125
V <i>MISURE DI VASCELLI ETC. DI...PROTO DELL'ARSENALE DI VENETIA</i> .....	143
Introduction .....	143
Description of the Manuscript.....	147
The Quinquereme .....	152
Transcription .....	154
Translation.....	156
Reconstructing the Quinquereme .....	159
Sternpost.....	159
Stem.....	162
Midship Frame .....	165
Construction of the Mold .....	176
Sheer Plan.....	178
An Interpretative Hypothesis of the Anonymous 16 <sup>th</sup> -century Venetian Shipbuilding Manuscript <i>Misure di vascelli etc. di... proto dell'Arsenale di Venetia</i> .....	182
VI SUMMARY AND CONCLUSIONS .....	192
WORKS CITED .....	197
APPENDIX I .....	240
APPENDIX II .....	246
VITA .....	253

## LIST OF FIGURES

	Page
Figure 1 Geometrical drawing illustrating the proportions of Fausto's great galley	121
Figure 2 Quinquereme from Scheffer's <i>De militia navali veterum</i> , 1654.....	130
Figure 3 Quinquereme from Meibom's <i>De fabrica triremium liber</i> , 1671 .....	131
Figure 4 Galleass "in the Fausto's way" ( <i>alla Faustina</i> ) .....	135
Figure 5 The "Fifth Question" from Fausto's <i>Aristotelis mechanica</i> , fol. 10r .....	139
Figure 6 Stern rudder "in the Fausto's way" and "in the Western way" .....	141
Figure 7 Reconstruction of the sternpost based on folio 6r of <i>Misure di vascelli</i> <i>etc. di...proto dell'Arsenale di Venetia</i> .....	161
Figure 8 Reconstruction of the stem of the <i>galea da 5</i> based on folio 6r-v of <i>Misure di vascelli etc. di...proto dell'Arsenale di Venetia</i> .....	162
Figure 9 Modified reconstruction of the stem of the <i>galea da 5</i> based on folio 6r-v of <i>Misure di vascelli etc. di...proto dell'Arsenale di Venetia</i> .....	164
Figure 10 Reconstruction of the midship frame based on folio 6v of <i>Misure di</i> <i>vascelli etc. di...proto dell'Arsenale di Venetia</i> .....	166
Figure 11 Suggested sequence for designing the midship frame, step 1.....	167
Figure 12 Suggested sequence for designing the midship frame, step 2.....	168
Figure 13 Suggested sequence for designing the midship frame, step 3.....	169
Figure 14 Suggested sequence for designing the midship frame, step 4.....	170
Figure 15 Suggested sequence for designing the midship frame, step 5.....	171

	Page
Figure 16 Suggested sequence for designing the midship frame, step 6.....	172
Figure 17 Suggested sequence for designing the midship frame, step 7.....	173
Figure 18 Suggested sequence for designing the midship frame, step 8.....	174
Figure 19 Suggested sequence for designing the midship frame, step 9.....	175
Figure 20 Construction of the mold for the <i>galea da 5</i> .....	176
Figure 21 Reconstruction of the sheer plan of the <i>galea da 5</i> based on folio 5r-v of <i>Misure di vascelli etc. di...proto dell'Arsenale di Venetia</i> .....	179

## LIST OF TABLES

	Page
Table 1 Venetian linear system of measurement.....	153
Table 2 Offset measurements of the sternpost .....	159
Table 3 Offset measurements of the stem .....	163
Table 4 Offset measurements of the midship frame.....	165
Table 5 Offset measurements of the sheer plan of the <i>galea da 5</i> .....	180

CHAPTER I  
INTRODUCTION

Sailing is a noble thing, useful beyond all others to mankind. It exports what is superfluous, it provides what is lacking, it makes the impossible possible, it joins together men from different lands, and makes every inhospitable island a part of the mainland, it brings fresh knowledge to those who sail, it refines manners, it brings concord and civilization to men, it consolidates their nature by bringing together all that is most human in them.<sup>1</sup>

Georgius Pachymeres, *Progymnasmata*, 585.29-586.4

Few phenomena shaped mankind as significantly as seafaring. The praise of sailing in the words of the 13<sup>th</sup>-century Byzantine scholar, Georgius Pachymeres, encloses and signifies all the reasons that motivated me to join the Nautical Archaeology Program at Texas A&M University in 2006, and that today resulted in the present research.

Venice, more than any other republic that overlooked the Mediterranean, was, during the Renaissance, the maritime city *par excellence*. Commerce was the *raison d'être* of the tiny Republic located in the northernmost extremity of the Adriatic Gulf.

---

This thesis follows the style of the *American Journal of Archaeology*.

<sup>1</sup> Μέγα ὁ πλοῦς καὶ τοῖς ἀνθρώποις ὑπὲρ ἄλλο τι χρήσιμον· τὸ περιττὸν ἐκφέρει, τὸ ἐνδέον ἐπινοεῖ, τὸ ἄπορον καθίστησιν εὐπορον, τὰ ἀναγκαῖα πορίζει, συνάπτει πρὸς ἀλλήλους ἄνδρας ἀλλοδαποὺς, καὶ ἠπειρῶ μινύει πᾶσαν νῆσον ἀμιχθαλόεσσαν, προσπορίζει γινῶσιν τοῖς πλέουσιν, ἤθη ἐξήμεροῖ, καὶ τὸ κοινωνικὸν προξενεῖ τοῖς ἀνθρώποις καὶ ἡμερον, καὶ συστατικὸν σχεδὸν γίνεται φύσεως, οἷς ὃ τι τὸ ἡμερον αὐτοῖς συνιστᾷ. Greek text published by Walz 1968, 1: 585-86.



The experience and mastery in shipbuilding and navigation made Venice “the most serene” Republic, the *Serenissima*. Although I have been in Venice many times, I always have the impression that I would never fully understand its complexity and its inner beauty made of different cultures, each of which brought new knowledge and flavor to Venice. The reason why I chose to study the maritime world of Renaissance Venice – and in particular Vettor Fausto – is precisely because, at that time, humanists like Fausto prized knowledge as their most treasured achievement. They believed that cultural exchange could perfect them as human beings and regarded the encounter with the other as an occasion to broaden their perspectives. More important, they were convinced that new ideas could change their world and greatly benefit the progress of mankind.

The life of Vettor Fausto (1490-1546) and his extraordinary achievements, both as a scholar and as a naval architect, fully capture the “spirit” of the Renaissance. Fausto attracted the attention of many naval historians, and earned a place of honor in the pantheon of the Renaissance innovators with the construction of his *quinqueremis* (quinquereme, or five-er).<sup>2</sup> The French historian Fernand Braudel noted, “Venice [...] designed its own ships, and it is not very prone to change them.”<sup>3</sup> The conception and building of Fausto’s new vessel type – the quinquereme therefore, deserves careful

---

<sup>2</sup> Brief biographical information on Fausto’s life appeared in the works by Degli Agostini (1752-1754, 2: 448-72), Tiraboschi (1824, 7: 1487-89), Casoni (1838, 2: 307:401), Cosenza (1962, 2: 1363-64), Lane (1965, 59-65), and Wilson (1988, 89-95). Recently, the entry “Vettore Fausto,” edited by Francesca Piovan, was added to the prestigious *Dizionario Biografico degli Italiani* (1995, 45: 398-401). The most authoritative and comprehensive account of the life of Fausto is, however, that of the distinguished historian Ennio Concina, *Navis: Humanism on the Sea* (1990). Concina also mentioned Fausto in other publications (1988a, 228-45; 1988b, 159-65; 1987a, 23-28; 1987b, 387-405; 2006, 99-125). Aymard (1980, 3: 302) wrongly identified Vettor Fausto with Fausto Venanzio da Sebenico, who is the author of the mechanical treatise titled *Machinae novae*.

<sup>3</sup> Braudel 1976, 1: 311: *Venezia [...] ha i suoi tipi di vascelli e non cambia volentieri*. For a most helpful overview of the types of ships built in the Venetian Arsenal during the Middle Ages and the Renaissance, see Concina 1991b, 211-58.

investigation with regard to its technical features. In addition, Fausto's contribution to Venetian Humanism has been extensively studied by eminent philologists and historians of Italian literature.<sup>4</sup>

This thesis complements past literature scholarship. Although research on Vettor Fausto is far from complete, both in terms of literary sources and especially regarding his technical innovations in Venetian naval architecture, Ennio Concina's *Navis: Humanism on the Sea* provides significant, detailed information. Concina presents a fascinating insight into the historical and cultural context of the Venetian Renaissance and Humanism surrounding Fausto's world.

In the 14<sup>th</sup> century, Italian humanists rediscovered ancient Greek and Latin works that had lain buried and fallen into obscurity in many Italian and European libraries and monasteries.<sup>5</sup> The rebirth of Classical culture (*rinascimento*) and the spread of Classically-inspired values resulted in major cultural changes and achievements in art, literature, philosophy, and architecture.<sup>6</sup> In Italy, the Renaissance led to a scientific revolution by promoting the application of the scientific method (*ratio*), which reached its peak with the scientist Galileo Galilei (1564-1642).<sup>7</sup>

In Venice, the Renaissance had a major impact on the Doge Andrea Gritti (1455-1538), who promoted radical changes not only in the reassessment of old political institutions (*renovatio imperii*), but also in the renewal of urban buildings (*renovatio*

---

<sup>4</sup> Hodius and Jebb 1742, 32; Legrand 1885, 1: 102-5 and 115; Lowry 1979, 54; and King 1986, 72. However, a comprehensive study of all Fausto's writings – both Latin and Greek – has to be undertaken. A few Greek epigrams have been published by Legrand, but others are scattered in the many editions Fausto published.

<sup>5</sup> Weiss 1969 and 1977; Reynolds and Wilson 1975.

<sup>6</sup> Ergang 1967; Wilson 1992, 124-57.

<sup>7</sup> Butterfield 1962; Shapin 1996.

*urbis*) and in the field of technology (*renovatio scientiae*).<sup>8</sup> The historical juncture of these reforms was crucial. At the time, the maritime power of Venice was seriously threatened by the Ottoman Sultan Suleiman II in the East, and the Holy Roman Emperor Charles V in the West, as well as by pirates.<sup>9</sup> Therefore, the Republic of Venice, in order to reassert its naval power in the Mediterranean, strongly encouraged the master shipbuilders of the Arsenal to submit new war galley designs.<sup>10</sup> The undisputed founder and champion of this naval program was not a skilled shipwright, but a young professor of Greek at the School of Saint Mark named Vettor Fausto, who, in the heat of this renewal scheme, proposed a new *scientia*, the *marina architectura*.

In 1525, Fausto proposed to the Venetian Senate to build a quinquereme. He claimed that his design was based on the *quinqueremis* “used by the Romans during their wars,”<sup>11</sup> and that he had derived the construction proportions for his ship “from the most ancient Greek manuscripts.”<sup>12</sup> A few months later the Senate granted to Fausto permission to proceed with the project and assigned him a ship-shed in the Arsenal.<sup>13</sup> In October 1526, Fausto began the construction of his ship, working alongside the other

---

<sup>8</sup> Tafuri 1984 and 1985; Concina 1988b, 159-60, 1989, 50-63; Concina and Molteni 2001, 75-157; Valeri 1958.

<sup>9</sup> Paruta 1718, 1: 301 and 528; Cessi 1988, 2: 526-28.

<sup>10</sup> Lane 1973, 367-69; Concina 1990, 117-38.

<sup>11</sup> ASVe, Consiglio di Dieci, Parti secrete, reg. 1, folios not numbered (see: APPENDIX I, doc. 2). However, this document immediately follows ASVe, Consiglio di Dieci, Parti secrete, reg. 1, fol. 62r (see: APPENDIX I, doc. 3). On the quinquereme and of the work of Fausto in the Arsenal, see: Concina 1990, 55; Bash 1998, 34; Hocker and McManamon 2006, 16-18. For the Roman *quinqueremis*, see: Casson 1971, 101-2, 105-6, 113-37, 140-44; Morrison and Coates 1986, 2, 9, 11, 23, 157; Casson 1994, 79-95; Morrison 1995, 68-9; Shaw 1995, 163-71; Morrison and Coates 1996, 57-66, 294-6 355-61.

<sup>12</sup> Supra n. 11. Morrison and Coates exclude any continuity of building quinqueremes from the Classical times to the sixteenth century. Renaissance scholars thought that the quinquereme had five superimposed levels of benches. The quinquereme built by Fausto was basically a “re-interpretation” of the Classical model adapted to the Venetian naval architecture, which involved galleys rowed at a single level.

<sup>13</sup> ASV, Consiglio di Dieci, Parti secrete, reg. 1, fol. 62r (see APPENDIX I, doc. 3).

shipwrights in the Arsenal.<sup>14</sup> Fausto's *quiqueremis* was designed as a 28-bench galleass rowed *alla sensile* ("in the simple way") by five rowers on each bench on either side, each with his own oar.<sup>15</sup> The quinquereme was completed in January 1529 and launched in April of the same year, amid a general skepticism, which Fausto soon dispelled when he won a race against the light galley *Cornera*. The Venetian historian Marin Sanuto (1466-1536) wrote an enthusiastic report of the occasion, celebrating Fausto's revival of Greek science.<sup>16</sup> Thus, the *marina architectura* was born.<sup>17</sup>

The *marina architectura*, "marine architecture," was based on the *navium ratio*, a shipbuilding principle applied to naval architecture. In the same way architects applied principle of geometric progression in designing buildings, or painters used the rules of perspective in their drawings. The *navium ratio*, however, differed substantially from empirical practices employed by Venetian shipwrights in the Arsenal, for it proceeded from a deep knowledge of ancient mathematicians' texts. Fausto, in a letter to his friend, the humanist Giovan Battista Ramusio (1485-1557), claimed that his naval architecture was based on *litterae et disciplinae*, the "knowledge" (*disciplinae*) that comes from the study of ancient works, the "erudite letters" (*litterae*).<sup>18</sup> For this reason, according to

---

<sup>14</sup> Writing a letter to his friend Ramusio, Fausto compared the hard-working days in the Arsenal to Heracles's descent into Ade and to Aeneas's one into Avernus. In: Weber 1894, 128-133.

<sup>15</sup> For a description of Fausto's *quiqueremis*, see: Casoni 1838, 17; Jal 1840, 1: 377-84; 1848, 1248; Fincati 1881, 57; Concina 1990, 82; Lane 1992, 59-65.

<sup>16</sup> Sanuto 1466-1536, L, col. 347. Hereafter Sanuto.

<sup>17</sup> The phrase *marina architectura* was first used by Vettor Fausto in a letter dated to 13 September 1530, and addressed to his friend Giovan Battista Ramusio. In: Weber 1894, 128-133. Barker (2007, 42) mistakenly wrote that Fausto never used the phrase in his writings. See discussion in CHAPTER III.

<sup>18</sup> *Supra* n. 17.

Fausto, “marine architecture” did not require the mere *fabrilis peritia*, “the craftsman’s practice”, but rather the *architecturae professio*.<sup>19</sup>

During this period, traditional shipbuilding practices relied on empirical methods and shipwrights’ skills and experience.<sup>20</sup> Vettor Fausto thought naval architecture, just as with terrestrial architecture, might similarly be improved through the imitation of ancient architects. On Fausto’s work, one can see the influence of Vitruvius’s *De architectura*, Leon Battista Alberti’s *De re aedificatoria* (1450), and other ancient writers’ works. Fausto was familiar with the Aristotelian “Mechanics,” since he published in 1517 in Paris a Latin translation of the work by Aristotle.<sup>21</sup>

Between 2006 and 2010, I have conducted extensive archival research in the Marciana Library and in other Italian and European archives and libraries in order to investigate significant aspects of Venetian maritime history and the Venetian Republic’s shipbuilding practices during the 16<sup>th</sup> and the 17<sup>th</sup> centuries.

“If the truth is the soul of history, documents and reports are the sources of the historical truth.”<sup>22</sup> Those engaged in archival research, however, soon learn that this is an optimistic approach, and that “the historical truth” does not exist. However, there is the interpretation of history. Manuscripts have to be interpreted while avoiding modern

---

<sup>19</sup> Supra n. 17.

<sup>20</sup> Several studies have been devoted to empirical shipbuilding practices involving geometrical methods recorded in Venetian manuscripts. See, for example: Anderson 1925: 135-63; Sarsfield 1984, 86-88, and Chiggiato 1987. Recent studies include: Barker 1986, 161-78; Rieth 1998, 317-28; McManamon 2001, 17-26; Alertz 2003, 212-21; Bondioli 2003, 222-7; Castro 2005, 159-74 and 2007, 148-54; Bondioli 2009, 3: 243-80; and McGee 2009, 3: 211-42.

<sup>21</sup> BNM, 2983: *Aristotelis Mechanica Victoris Fausti industria in pristinum habitum restituta ac latinitate donata. Parisiis: in aedibus Iodoci Badii (1517)*. Hereafter Fausto 1517.

<sup>22</sup> Thus, the Venetian ambassador to France, Sebastiano Foscarini, stated before the Senators on 29 July 1684: *Se la verità è l’anima della storia, della verità storica le memorie e le relazioni possono dirsi la fonte*; Barozzi and Berchet 1863, 3: 353.

mental structures that could be misleading. Thus, this thesis offers *an* interpretation of Vettor Fausto and his quinquereme.

For the purpose of this study, first a survey of existing documents and publications containing information on Vettor Fausto was undertaken. In this regard, Ennio Concina's *Navis: l'Umanesimo sul mare* (1990) has been a precious source. The State Archive of Venice contains several folders (*fondi*), each containing hundreds of manuscripts. Each *fondo* consists of registers (*registri*) and sub-folders (*filze*). In order to investigate Fausto's background and his ingenious contributions to naval architecture, records of different government councils: *Comuni* and *Secrete* from *Consiglio di Dieci Comuni* (Council of Ten), Registers and Strands from the *Senato Mar* (Senate of the Sea), *Maggior Consiglio* (Major Council), *Patroni e Provveditori all'Arsenale* (Lords and Superintends of the Arsenal), Notarial acts and Secret Deliberations from the *Collegio* (College), *Senato Terra* (Senate of the Land), *Avogaria di Comun* (Investigative Magistracy) were investigated.<sup>23</sup> As a premise, it should be pointed out that all the documents presented in this thesis have been transcribed by the author according to the rules of paleography, with minimal alteration to the texts: abbreviated words are written out in full, *j* is represented as *i*, & is written as *et*, and punctuation modified to make reading of the documents easier. Other letters, such as *ç* for *z*, and *z* for the doubling of *c*, are left in their original spelling for they are typical of the Venetian dialect. Quotations from documents and primary sources are always italicized, whereas the translation into English is placed between quotations marks or in block quotation.

---

<sup>23</sup> A comprehensive overview of the State Archive of Venice is provided by Da Mosto 1937.

The most revealing document for this study is the manuscript titled *Misure di vascelli etc. di... Proto dell'Arsenale di Venetia* (“Measurements of vessels etcetera by...a master shipbuilder of the Arsenal of Venice”), which contains shipbuilding instructions for several types of ships.<sup>24</sup> The manuscript, originally belonging to the private collection of the erudite Giovan Vincenzo Pinelli (1535-1601), has been never fully studied and its author is not indicated. Perhaps, due in part to lack of technical shipbuilding knowledge, modern scholars have failed to relate this manuscript to Fausto’s work in the Arsenal. This is all the more regrettable, considering that the manuscript was well known since the 19<sup>th</sup> century but still misinterpreted.<sup>25</sup>

The series of calculations contained in the manuscript are based on both ancient and modern mathematics, and required an extensive knowledge of mathematics that only Fausto could have possessed. This thesis argues that the manuscript is the work of Fausto’s apprentice, Giovanni di Maria di Zanetto, nicknamed Zulle, who became *proto* (master shipbuilder) of the Arsenal in 1570. Zulle copied the shipbuilding instructions of his master and, at the eve of the Battle of Lepanto (7 October 1571), he built the last galleon *alla Faustina* (“in the Fausto way”). This vessel became the flag ship of the Christian fleet led by Marcantonio Colonna against the Turks.<sup>26</sup> However, Fausto’s “Greek dream” and his *marina architectura* perished off the coast of Ragusa, when lightning struck the galleon.<sup>27</sup>

---

<sup>24</sup> Mauro Bondioli deserves all my appreciation and gratitude for providing a copy of this manuscript when I first began my research. He also assisted me during the initial stage of my work.

<sup>25</sup> Fincati 1881, 80-81; Tucci 1964, 277-93.

<sup>26</sup> Concina 1990, 115; Hocker and McManamon 2006, 17.

<sup>27</sup> This information comes from the recently discovered and unpublished manuscript titled *Il Chartiggiatore* (1570) under examination by the author.

Additional research revealed new details concerning Fausto's cultural background and the period of his life before the construction of the quinquereme, hitherto poorly documented.

The archival sources, as official documents issued by the Venetian magistracies, recorded the exact date and offered solid chronological references. However, considering his fame in Venice, one does not encounter Vettor Fausto's name on the documents as often as one would expect. Fausto's name begins to appear only after 1519, when he made his entrance into the public life of Venice by his election to the Greek lectureship at the School of Saint Mark. Other biographical references to Fausto can be found in archival records only when Fausto appealed to some Venetian magistrate, such as in 1525, when he appealed to the Council of Ten and presented to the senators his proposal for building the quinquereme.

Chapter II of the thesis traces Fausto's life from the first years of the 16<sup>th</sup> century until his death in 1546. Much of the information about his life comes from documents and official decrees in the Venetian Archives, and from the *Orationes quinque* ("Five Orations"), written by Fausto and "diligently published by his friends, with all the care possible."<sup>28</sup> The *Orationes*, printed posthumously in 1551 by the famous Aldine press, can be regarded as Venice's last homage to the undiscussed protagonist of its maritime history, and to one of the most active humanists of the Republic's cultural scene. The *Orationes quinque* opens with an anonymous dedicatory epistle that contains a short biography of Fausto. Addressed to Pier Francesco Contarini, Fausto's patron, it was

---

<sup>28</sup> BNM, Aldine 359: *Victoris Fausti Veneti Orationes quinque eius amicorum cura quàm fieri potuit diligenter impressae, apud Aldi filios Venetiis MDLI.*



attributed to the humanist Paolo Ramusio (1532-1600) by Giovanni Degli Agostini.<sup>29</sup> If, on one hand, the dedicatory epistle traces the most relevant stages of Fausto's life, on the other, it fails to provide any chronological references. Conversely, although the "Five Orations" cover a short time-frame (1519-1522), they provide significant information and enable us to penetrate Fausto's personality. In the opening decade of 16<sup>th</sup> century, Fausto began his study at the prestigious School of Saint Mark. In 1509, the War of the League of Cambrai drastically changed the situation in the Republic and the School was temporarily closed. Fausto then undertook a six-year-long journey that brought him to the Mediterranean, other Italian maritime cities, Spain, and France. Upon his return to Venice, he wished to place his knowledge at the disposal of the *Serenissima*. In 1518, Fausto was appointed professor of Greek at the School of Saint Mark, which reopened after the war in 1511. In 1526, Fausto proposed to the Venetian Senate the construction of a quinquereme based on Classical proportions. With skepticism, the senators approved his request. In 1529, Fausto launched his quinquereme in the Grand Canal of Venice, where the ship won a race against a light galley. This chapter concludes by discussing sources and documents about the naval career of Fausto's quinquereme in Greek waters.

---

<sup>29</sup> Degli Agostini's (1754, 2:469) view that Paolo Ramusio is the author of the dedicatory epistle found a voice in other scholars (Cicogna 1827, 2: 332; Concina 1990, 41, n. 1; Piovan 1995, 398-401). Although the edition I consulted (BNM, Aldine 359) has the name of Paolo Ramusio crossed out, and, for this reason, Vendruscolo advises caution in attributing it to Paolo Ramusio (2005 41, n. 26), I believe that this hypothesis is convincing. In fact, Paolo Ramusio's affiliation to Contarini, man of learning and patron of many humanists, dates to 1541, when the latter, returning from his embassy to France, brought from Brussels Villehardouin's *History of the Conquest of Constantinople*, an account of the Fourth Crusade. In 1556, Paolo's father, the famous Giovan Battista Ramusio, obtained from the Council of Ten, for his son, the privilege of publishing a Latin translation of the manuscript. Contarini publicly commissioned Paolo for the work, which was ready in 1573 and was published in 1604 (Parks 1955, 143).

Chapter III of the thesis focuses on the *marina architectura* and the influence of Classical culture on Venetian naval architecture. In the 14<sup>th</sup> century, Italian humanists revived the foundations of ancient learning through the rediscovery of ancient Greek and Latin works, which had lain buried in many European libraries and monasteries, and had fallen into obscurity. The rebirth (*rinascimento*) of Classical tradition and the spread of classically-inspired values resulted in significant cultural changes and achievements in many fields, from art and literature to philosophy and architecture. Fausto purported to introduce in naval architecture a shipbuilding principle that he applied in the design of his quinquereme. According to Vettor Fausto, the *marina architectura* has to be based on the knowledge that derives from the study of Greek mathematicians, and not only on personal experience and practical skills. By discussing the long-lost manuscript *Navis* by Leon Battista Alberti (1404-1472), Chapter III defines the concept of proportion and symmetry in architecture, and examines some passages from Vitruvius's *De architectura*. It discusses the impact of the rediscovery of the work of Vitruvius (80-15 B.C.E.) on Renaissance culture and humanists.

The Renaissance idea of beauty, which was derived from the harmony of proportions, led to major changes in the rules of naval architecture. “A galley” – said the sea captain Cristoforo da Canal sometime during the mid-16<sup>th</sup> century – has to resemble “a graceful young lady who shows liveliness and readiness by her gestures.”<sup>30</sup> Yet, the art of shipbuilding, as all crafts based on oral knowledge, has maintained throughout the centuries its conservative character. New techniques and design have always been

---

<sup>30</sup> Cristoforo da Canal, *Della milizia marittima*, Book 1: *Una giovane leggiadra la quale in tutti i suoi gesti dimostri prontezza e vivacità*. In: Nani Mocenigo 1930, 66.

difficult to penetrate the mind of the shipwright, who relied on his practical expertise and repetitive gestures.<sup>31</sup> Thanks to the past works of eminent scholars who studied naval architecture manuscripts, our knowledge and understanding of shipbuilding practices has significantly increased and improved.<sup>32</sup> We know that at least starting from the second half of the 14<sup>th</sup> century, shipwrights designed ships by means of molds and gauges incised with progressive marks.<sup>33</sup> The marks were obtained by simple geometrical methods that are often graphically represented in shipbuilding manuscripts, such as those in *Libro di Zorzi Trombetta da Modon* (“The Notebook of Zorzi Trombetta from Modon”) dated to 1444-49.<sup>34</sup> The shipwright moved the molds (*sesti*) along each frame, thus obtaining the narrowing and the rising for each frame.

These shipbuilding methods were based on rules of geometry, such as proportions, and are referred to in Venetian manuscripts as *ragioni fabricatorie*, “building methods.” At this juncture, it is useful to recall the definition of *ars*, “art,” as provided by the Roman writer Cassiodorus (ca. C.E. 485-573) in his *De artibus ac*

---

<sup>31</sup> An interesting portrait of the Renaissance shipbuilder is depicted by David Proctor (1987, lxxxvii-xcii) in his contribution to the study of the 15<sup>th</sup>-century Venetian manuscript *Ragioni antique*.

<sup>32</sup> The list of scholars is very long, and they will be mentioned throughout this work. However, I would like to call attention to a brilliant and enlightening Italian article that is, but likely to be unknown to many scholars probably to the language. The article is “Metodi di riduzione utilizzati dino alla prima metà del XVIII secolo” (“Reduction Methods Used until the First Half of the 18<sup>th</sup> Century”) by Giuseppe Mercato (1998). The article provides a lengthy discussion on geometrical methods used in ship design, their corresponding formulas, and their theoretical application.

<sup>33</sup> The earliest manuscript that records the geometrical methods in ship design is *Libro di navigar*, “The Seafaring Book” (LAM, Ms. MA334). Franco Rossi (2009, 1: xv), in a recent contribution to the study of “The Book of Michael of Rhodes,” thanked Raffaella Franci for drawing his attention to the manuscript, and anticipated his forthcoming publication of the *Libro di navigare*. A transcription of the manuscript has been provided to me by Mauro Bondioli, along with the images of folios 25v-26r that discuss geometrical methods.

<sup>34</sup> BBL, Cotton ms., Titus A XXVI. The geometrical methods are on folio 45r. It is unfortunate that this important manuscript has yet to be fully studied and published along with its vibrant watercolors. The two main articles on the manuscript are those by Anderson (1925, 135-63), with some excusable inaccuracies in the transcriptions, and Rieth (2001, 81-104).

*disciplinis liberalium litterarum* (“On Arts and Liberal Disciplines”): “it is called art whatever confines and restrains us with its rules.”<sup>35</sup>

However, the 16<sup>th</sup> century was a period of technical innovations in naval architecture. Fausto, “expert and capable of the most subtle reasoning,”<sup>36</sup> purported to introduce in naval architecture a shipbuilding principle that he applied in designing his quinquereme. Fausto basically codified the empirical shipbuilding methods of the Venetian shipwrights into a mathematical formula, known today by mathematicians and scientists as Gauss’s formula. Karl Friedrich Gauss (1777-1885) proved that every triangular number is a figurative number that can be represented in the form of a triangular grid of points, where the first row contains a single element, and each subsequent row contains one more element than the previous one.<sup>37</sup> Gauss’s formula is expressed as follows:

$$\Sigma = n \times \frac{n + 1}{2}$$

where, n = positive integer and  $\Sigma$  = sum

Remarkably, Fausto had already discovered Gauss’s formula much earlier. Thus, the construction of the quinquereme had a revolutionary impact on the art of shipbuilding, for it was no longer an *ars* but rather a *scientia*, that of “marine architecture.” In historical terms, Fausto stands to the French architect Jean Mignot, as the Arsenal stands to the Cathedral of Milan. In 1399, Jean Mignot was consulted on the

---

<sup>35</sup> Cass. *De art.* 1: *Ars vero dicta est quod nos suis regulis arcet atque constringat.*

<sup>36</sup> Galilei 1638, 1.1: *Peritissimi e di finissimo discorso.*

<sup>37</sup> The triangular numbers were first discovered by Pythagoras of Samos (sixth century B.C.).

construction reliability of the Milan Cathedral as it was being built. Mignot argued that the cathedral would inevitably collapse if completed as planned. Somewhat irritated with the Italian masons and builders, Mignot claimed “art without science is nothing,” *ars sine scientia nihil est*.<sup>38</sup>

Chapter IV of the thesis presents Renaissance documents that provide descriptions of Fausto’s quinquereme and illuminates its technical features, such as the number of benches, the rowing system, and the steering mechanism. Fausto claimed that he restored the ancient quinquereme used by Romans in their wars. Whether this was the case or not is discussed in this chapter, which also presents several Classical sources about the Roman-built quinquereme. Fausto claimed that the proportions of his quinquereme were based on ancient Greek texts. This chapter suggests a new hypothesis about the Greek sources Fausto might have consulted.

Chapter V discusses the 16<sup>th</sup>-century Venetian shipbuilding manuscript *Misure di vascelli etc. di...proto dell’Arsenale di Venetia* (“Measurements of ships by... master shipbuilder of the Arsenal of Venice”), which contains shipbuilding instructions for several types of ships. This anonymous manuscript, originally belonging to the private collection of the erudite Giovan Vincenzo Pinelli (1535-1601) has never been studied.

The hypothesis proposed in this chapter is that the manuscript is the work of Giovanni di Maria di Zanetto nicknamed Zulle, who was Fausto’s pupil and became master shipbuilder of the Arsenal in 1570.

---

<sup>38</sup> Ackerman 1949, 84-111.

I consider this thesis a starting point for a more in-depth research on Vettor Fausto, his brilliant life, his fascinating work as a humanist, and his contribution to Venetian naval architecture. It is hoped that future discoveries from archives and libraries will add new information to our knowledge, broaden our perspective, and even challenge the conclusions reached here.

## CHAPTER II

VETTOR FAUSTO (1490-1546):

NAVAL ARCHITECT AND PROFESSOR OF GREEK

**Introduction**

Belonging to a modest family of Greek origin, Vettor Fausto was a *civis venetus originarius*, a “native citizen of Venice,”<sup>39</sup> in his *Orationes quinque*, Fausto referred to Venice as his homeland (*patria*).<sup>40</sup> In his second oration, Fausto explicitly stated: “This is the land where I first whimpered, and where there are the altars of household deities, the bones of my parents, and long-term friendships.”<sup>41</sup> Paolo Ramusio recalled to Pier Francesco Contarini that Fausto “was born [...] in this famous and distinguished maritime Republic.”<sup>42</sup>

That Vettor Fausto signed the Greek epigrams he published in many editions with the Greek version of his name, *Νικῆτας ὁ Φαῦστος* (*Nikētas Phaustos*), has caused some confusion about his nationality.<sup>43</sup> Marcel Bataillon believed that Fausto “was definitely Greek by birth.”<sup>44</sup> Alberto Tenenti referred to Fausto as “le fameux technician

---

<sup>39</sup> BCVe, Cons. IX, d. 1-2, Cittadini veneziani, fol. 190r; ASVe, Senato terra, reg. 20, fol. 159r; Sanuto, XXVI, col. 127. The name and origin of Fausto’s mother is unknown.

<sup>40</sup> Fausto 1551, *Oratio prima*, fol. 1a, 10a, 17b, and 18b.

<sup>41</sup> Fausto 1551, *Oratio secunda*, fol. 19a: *hoc est solum illud in quo primum vagire occepi, aras deorum penatium, ossa parentum, veteres necessitudines.*

<sup>42</sup> Fausto 1551, *Dedicatio*, fol. 3b: *in celebri illo et admirabili vestrae reipublicae navali [...] natus erat.*

<sup>43</sup> *Νικῆτας ὁ Φαῦστος* appears in the edition of the Terentian comedies (1511), in the *Grammaticae Institutiones* by Urbano Bolzanio dalle Fosse (1512), and in the edition of the New Testament of the Complutensian polyglot Bible (1514). For the latter, see: Legrand 1885, 1: 115.

<sup>44</sup> Bataillon 1937, 2, 29: “*Νικῆτας Φαῦστος*, evidentemente griego de nación.”

grec”<sup>45</sup> and affirmed that he was a Greek émigré who took refuge in Italy toward the 1520s.<sup>46</sup> This opinion was propagated by a document in the Archive of Simancas that records that Fausto was a “Greek master-builder of the shipyards,” and that “his father was Greek and he was born here [Venice].”<sup>47</sup>

The issue of Fausto’s name is, however, more complex than it appears. Fabio Vendruscolo demonstrates in a brilliant article that Vettor Fausto’s original name was *Lucius Victor Falchoni*.<sup>48</sup> This assumption is based on several solid pieces of evidence. First, the *praenomen* (Lucius), and the *nomen* (Victor) are the same. *Lucius* is documented in the title of the Terentian edition, which reads *L(uci) Victoris Fausti*. Second, there are some intriguing biographical congruences that, if not coincidental, reveal that Vettor Fausto and Lucio Vittor Falconio are the same person. In fact, both claimed to have been pupils of Gerolamo Maserio, and both asserted that the city of Lucca offered to them a Greek lectureship.<sup>49</sup> Both were versed in Greek, and both were interested in the comedies of Terence.<sup>50</sup> Finally, the calligraphic examination conducted by Vendruscolo on their autographed documents revealed that Falconio and Fausto had similar handwriting.

The identification of Vettor Fausto with Lucio Vittor Falconio establishes, once and for all, the *vexata questio* of his date of birth. Concina, following Degli Agostini,

---

<sup>45</sup> Tenenti 1962, 29.

<sup>46</sup> Tenenti 1962, 45.

<sup>47</sup> Magdaleno Martin 1976, 26: 1308, n. 110: *Fausto, griego, maestro de atarazanans [...] su padre hera griego y es nasao aqui*. Due to a typographical error, Concina (1990 41, n. 1) gives the volume of the document as 25 instead of 26.

<sup>48</sup> The following paragraph is based on the article by Fabio Vendruscolo (2005).

<sup>49</sup> See: Bersanti 1905, 33.

<sup>50</sup> Vettor Fausto published an edition of the Terentian comedies in 1511, and Lucio Vittor Falconio owned a manuscript containing the Terentian comedies. See Vendruscolo 2005.



notes that Fausto was born “at the beginning of 1480s,”<sup>51</sup> whereas Piovan generically suggests that “the date has to be placed slightly afterward.”<sup>52</sup> A manuscript belonging to Falconio/Fausto titled “The Lives of Plutarch written in Greek” (*Plutarchi vitas graece scriptas*), records that “in the month of June 1510, [my] twentieth year.”<sup>53</sup> Therefore, one can safely assume that Falconio/Fausto was born in 1490/91. This information is further confirmed by a second manuscript containing the tragedies of Aeschylus, in which Falconio/Fausto asserts that, in 1508/1509, he was eighteenth years old.<sup>54</sup>

To these biographical remarks, I would like to add a few more comments. The first concerns the reason why Falconio decided to change his name. The second, why he chose to be named Fausto. As a premise, it was common for humanists to assume a pseudonym of classical reminiscence.<sup>55</sup> Vendruscolo argues that Fausto changed his name “when [...] he left the city of Venice, and resolved to change the course of his life seeking for glory and new experiences.”<sup>56</sup> However, Fausto left Venice in 1513, whereas the earliest appearance of both the Latinized *Faustus* and the Greek *Φαῦστος* (*Phaustos*) is dated in 1511.<sup>57</sup> I believe Falconio adopted the “humanistic pseudonym” of Fausto, when he joined the illustrious humanistic circle of Venetian *literati*. It is not coincidental

---

<sup>51</sup> Degli Agostini 1754, 2: 448; Concina 1990, 26.

<sup>52</sup> Piovan 1995, 398.

<sup>53</sup> ULG, Hunter 424, fol. 323v: *anno aetatis vigesimo 1510 mense junii*. In: Vendruscolo 2005, 39.

<sup>54</sup> BNN, Neap. II.F.30, fol. 1r. In: Vendruscolo 2005, 39.

<sup>55</sup> For example, the humanist Alessandro Bondini assumed the name of the Greek geographer Agathemerus (third century C.E.), Giovan Battista Cipelli signed his works as Egnatius because he was born in the town of Eгна, near Bolzano; the pseudonym of Giovanni Badoer, was Phylareto.

<sup>56</sup> Vendruscolo 2005, 48: *quando [...] si accingeva a dare una svolta alla sua vita, lasciando Venezia in cerca di Gloria e di nuove esperienze*.

<sup>57</sup> See the edition of the Terentian comedies dated to 1511 and published by Lazzaro Soardi (Rhodes 1978, 59). The Latinized *Faustus* appears in the title of the work, whereas the Greek version *Φαῦστος* (*Phaustos*) appears in the Greek epigram that opens the edition.

that he started using the pseudonym *Faustus*, or its Greek calque *Φαῦστος* (*Phaustos*), in concomitance with his first publications.<sup>58</sup>

With regard to the reasons that induced Falconio to adopt the name of Fausto, Vendruscolo presents a document dated to 1514, in which a certain “Vetor Falcon” is said to be the husband of a certain Faustina Contarini.<sup>59</sup> Thus, Vendruscolo suggests that Fausto choose his pseudonym from the name of his wife, but proceeds to point out that the document is controversial due to its uncertain reading, and that in a second document dated to 1516, Faustina Contarina is accorded as the wife of Marcantonio Boldù.<sup>60</sup> A letter dated to 29 May 1529, written by Pietro Bembo (1470-1547) and addressed to Giovan Battista Ramusio (1485-1557), the father of Paolo Ramusio, however, unravels any doubt on this matter. Bembo, through an earlier letter, was informed that his friend Fausto succeeded in building his quinquereme and that the ship won a race in the Grand Canal against the galley *Cornera*. Bembo, exultant over the victory of Vettor Fausto, writes, “Oh my [dear] Vittore, (you are now truly both *Vittore* and *Fausto* and *Fortunato* and *Felice*).”<sup>61</sup> In this sentence, Bembo explains the meaning of the name “Vettor Fausto.” “Vittore” comes from the Latin *victor*, or “victorious,” and “Fausto” is associated with the Latin *Faustus* meaning “lucky” (*fortunato*) and “happy” (*felice*), and with the Greek *φαῦστος* meaning “bright, illustrious, and famous.”<sup>62</sup>

---

<sup>58</sup> Fausto used his Greek calque specifically when writing in Greek.

<sup>59</sup> ASVe, Dieci Savi alle Decime, Condizioni, reg. 47, 48. In: Vendruscolo 2005, 38.

<sup>60</sup> ASVe, Indice 86ter 1, Matrimoni patrizi per nome di donna, 265. In: Vendruscolo 2005, 38.

<sup>61</sup> Bembo, letter n. 975, 25-26: *Oh messer Vittorio mio (e veramente ora e Vittore e Fausto e Fortunato e Felice)*. In: Travi1992, 3: 45.

<sup>62</sup> The Greek *φαῦστος* is the past participle in the masculine form of the verb *φάω* (*phaō*), which means “to shine.” See: Liddell and Scott 1953, 1920.

Thus, from these preliminary remarks emerges a fundamental trait of the personality of Fausto – the desire for fame and glory. This is not to be confused with mere ambition, but has to be connected with the idea promoted by the ancients, that through great and noble deeds a man would live in memory to posterity. Sanuto, who witnessed the victory of the quinquereme on the Grand Canal, said, “It has been wonderful watching it [...] Therefore, Vettor Fausto, who designed it, will be immortal.”<sup>63</sup> Fausto, in his first oration where he thanks the Senators for his appointment to the Greek lectureship, proudly declares, “This privilege is great, fathers – great and immortal – indeed I owe to thou my own name.”<sup>64</sup> And again, Fausto, addressing the Senators says, “Thou [Senators] made my name forever famous and illustrious among men.”<sup>65</sup>

In the judgment of the humanists – such as Bembo, Sanuto, and others that I shall present in the course of this work – Vettor Fausto had fulfilled, in his lifetime, his abiding aspiration toward greatness and immortality. This indeed is a remarkable achievement considering that Fausto was neither a nobleman nor a rich Venetian, but a parvenu, or to say it in Fausto’s own words, an *ignotus vir* and *homo novus*.<sup>66</sup> In the dedicatory epistle that opens Fausto’s *Orationes quinque* (1551), Paolo Ramusio (1532-1600) addressed Pier Francesco Contarini as follows, “Fausto [...] for his social

---

<sup>63</sup> Sanuto, L, col. 364: *Fo bellissimo veder [...] Sichè Vettor Fausto autor di darli il sesto sarà immortal.*

<sup>64</sup> Fausto 1551, *Oratio prima*, fol. 2b: *Magnum est hoc beneficium patres, magnum atque immortale, quod vobis vel hoc ipso nomine debeo.*

<sup>65</sup> Fausto 1551, *Oratio secunda*, fol.19a: *nomenque meum in hac hominum luce clarum atque illustre perpetuo collocaret.*

<sup>66</sup> Literally meaning “unknown man” and “new man.” *Homo novus* was used in Roman political terminology to indicate a person of humble origin who was able to climb the social ladder and to accomplish a brilliant political career. Fausto defines himself *ignotus vir* and *homo novus* in his writings.

condition and for the meager fortune of his family, easily could have remained in the shadows of history, except that a unique and great talent made him famous.”<sup>67</sup>

### ***Ratio and Virtus: Fausto as a Metaphor of the Human Being***

Man of extraordinary intelligence “...with a wit versatile in every thing...,”<sup>68</sup> fluent in Greek and Latin, knowledgeable in Hebrew and Aramaic, public lecturer at the School of Saint Mark, traveler, translator of many ancient authors, soldier at the defense of the Republic, Fausto became the acclaimed genius of the *renovatio navalis* by introducing technical innovations in Venetian shipbuilding practice.<sup>69</sup> His polymathic attitude and picaresque life, which verged dangerously on eclecticism if viewed by modern mentality,<sup>70</sup> cannot be understood and appreciated without taking into consideration the complex and articulated paths through which Venice elaborated its mental constructs during the Renaissance.

In formulating this methodological problem, my purpose is to reconnect Vettor Fausto’s technological innovations in Venetian naval architecture with the universe of values dominating the *mentaliti * during that period. This task is labyrinthine in some instances and imperative in others, since Vettor Fausto is not a figure who can be easily understood within the historical abstractions of Renaissance and Humanism. One should

---

<sup>67</sup> Fausto 1551, *Dedicatio*, fol. 2b: *Faustus [...] tum genere ipso, tum rei familiaris tenuitate, facile potuerit esse semper obscurus, nisi uno tantum atque eo magno ingenio repente clarus esse.*

<sup>68</sup> Fausto 1551, *Dedicatio*, fol. 3b: [*Faustus*] *erat ideo ad omnia ingenio.*

<sup>69</sup> Tafuri (1989, 110) framed Fausto’s works as naval architect within the “technical renovation,” the *renovatio scientiae*, which seems, although not formally incorrect, a term that does not properly define and acknowledge Fausto’s original contribution to the field of naval architecture. Given Fausto’s achievements, it is more appropriate to refer to a *renovatio navalis*.

<sup>70</sup> Vettor Fausto is defined “colorful and curious” by Patricia Labalme (2008, 249).

not ignore that the Renaissance bears the intrinsic symbiosis between *novitas* and *renovatio*: the “new” made possible the “renewal.” Nonetheless, this philological formulation reveals a subtle dichotomy; that *novitas* was a progression, but filtered and re-interpreted through the model of the ancients. Therefore, the progression was also a “return” to the past that legitimized and guaranteed the “new.” When referring to “technological innovations,” therefore, we should not forget this historical paradox.

Likewise, if we attempt to encompass Fausto’s contributions to naval architecture within the framework of Humanism, our understanding would have to be limited to cultural aspects. It could not be otherwise, as Concina admitted, given the paucity of the documentation related to the quinquereme’s technical aspects: “Fausto’s notes disappeared... as well as his drawings; to our knowledge, there are no extant iconographical sources about his quinquereme. Only few writings by Fausto and some literary sources could be useful in sketching out some technical features, and, more importantly, in understanding how a man of learning decided to work in the shipyards and what is the cultural significance he attributed to his enterprise.”<sup>71</sup> Modern scholars, however, have failed to relate Fausto’s work in the Arsenal to the anonymous manuscript *Misure di vascelli etc. di...proto dell’ Arsenal di Venetia*, a source well known since the 19<sup>th</sup> century but still misinterpreted.<sup>72</sup>

---

<sup>71</sup> Concina 1990, 71: *Scompare le carte del Fausto...i suoi disegni, della quinquereme non restano, per quanto ci è noto, neppure tracce iconografiche e solo pochi suoi scritti, oltre a qualche fonte letteraria, possono essere utili per ricostruirne sommariamente le caratteristiche e soprattutto per comprendere come l’uomo di lettere si fosse deciso a entrare nei cantieri e quale fosse il significato culturale da egli stesso attribuito alla propria impresa.*

<sup>72</sup> Fincati 1881, 80-81; Tucci 1964.

The purpose of this research goes beyond mere historical and cultural categories. If it is true that the greater achievement of the Renaissance was "...discerning and bringing to light the full, whole nature of man..."<sup>73</sup> I intend to focus my study on the unexplored *humanitas* of Vettor Fausto, his "essence" and "existence" as a Renaissance human being. For the explication of the concepts of *essentia* and *existentia* – two fundamental terms that cross the history of Western philosophy, from Aristotle to Heidegger – I believe that a purely historical path would offer a partial and incomplete interpretation. Rather, a full explanation of these two ontological terms can be offered necessarily only by philosophy and, more specifically, by anthropology. In order to define what is intended here by anthropology, one should recall the words of the French philosopher and historian Michel Foucault (1926-1984):

It may be part of the destiny of Western philosophy that, since the 19<sup>th</sup> century, something like anthropology became possible. When I say 'anthropology' I am not referring to the particular science called anthropology, which is the study of cultures exterior to our own. By 'anthropology' I mean the strictly philosophical structure responsible for the fact that the problems of philosophy are now all lodged within the domain that can be called that of human finitude. If one can no longer philosophize about anything but man, in so far as he is a *homo natura*, or insofar as he is a finite being, to that extent isn't every philosophy at bottom anthropology?<sup>74</sup>

Thus, in this study, an anthropological approach has been adopted, or rather a philosophical one. I attempt to penetrate and explore Vettor Fausto's human nature (*homo natura*). Only by starting from a philosophical basis can one decipher what

---

<sup>73</sup> Burckhardt 1904, 308.

<sup>74</sup> Foucault 2000, 1: 250.

formed Vettor Fausto's thoughts, ideas, beliefs, and conceptions that determined his actions, choices, decisions, and even frustrations. Only on these premises can we then project Fausto in his historical and cultural dimensions. Given the complexity of human nature, however, the reconnection of Vettor Fausto to the values of Renaissance universe cannot follow main paths. Nor shall we betray our initial assumption, which avoided interpreting the past by modern categories.

Behind the purpose of extending our field of inquiry beyond the Renaissance and Humanism as pure historical abstractions lies precisely the fundamental question on the nature of history. Following the great Fernand Braudel, I conceive history as the result of individual achievements (*histoire de l'individu*) accomplished through intellectual capacity (*ratio*) as the primary cause that determines actions (*histoire événementielle*).

It is useful to remember that the human dimension of history, and the awareness that man determines his own actions through reason, was a genuine concept elaborated during the Renaissance as the result of the wide circulation of Neo-Platonic philosophy. Before the 15<sup>th</sup> century history was conceived as a succession of unpredictable events caused by superior powers, whether by God's inscrutable will or by fate, and that man was a mere passive spectator of his own destiny.

During the Renaissance, Neo-Platonism revived through Marsilio Ficino (1433-1499), who published in 1492, the first Latin translation of Plotinus' *Enneads* ("Nine Essays"), which can be regarded as the most comprehensive synthesis of Neo-Platonic philosophy, incorporating the teachings of Plato, Aristotle, Pythagoras and other Greek

philosophers.<sup>75</sup> In the *Enneads*, which greatly contributed to shaping Western thought, Plotinus formulated his “theory of virtues,” which consisted of wisdom, temperance, courage, and justice. Essentially, Plotinus claimed that, if each individual lets prevail the rational soul (reason) above both the emotional (instincts) and the appetitive souls (passions), a man can control his own actions through reason.<sup>76</sup>

This very basic concept of the man being the master of his own destiny had a revolutionary impact on Renaissance thought. The capacity for reasoning makes humans different from animals. This not only crowned man’s supremacy over Nature, but it also decreed the *virtus* as *the* quality of human nature that each man should possess and embrace in life. Etymologically, the *virtus* carried a series of connotations strictly related to the *vir* (man), and meant excellence and good behaviour, directed for the benefit and enhancement of civic life. In Renaissance Venice, the *virtus* was celebrated in poetry, music, lyrics, visual arts, and in official and popular history.<sup>77</sup> More important, the Plotinian theory established the link between cause and effect recognized as the primary analytical tool by which man could guide his own destiny.

---

<sup>75</sup> Plotinus (204-270 C.E.) was the most important Neo-Platonic philosopher. His numerous writings were collected together by his pupil Porphyry into nine essays, the *Enneads*. During the fifteenth century, the interest in Plotinus was stimulated by the Cardinal Bessarion and, most of all, by Georgius Gemistus Pletho, the Byzantine scholar who re-introduced Plato’s works to Western Europe, and co-founded, with Cosimo de’ Medici, the Platonic Academy in Florence, under the direction of Marsilio Ficino. For the recovery of Plotinus during the Renaissance, see Hankins and Palmer, 2008: 52-53.

<sup>76</sup> Plot. 1.2. The passage is echoed by Cicero (*Off.* 1.28-29). For the tri-partition of the soul, see Pl. *R.* 439d and *Ti.* 69e-70e. For the reception of Plotinus and his work during the Renaissance, see Gerson 1994.

<sup>77</sup> Muir 1981, 21.



This concept also found a voice in Cicero, whose works owe much to Plato and Aristotle.<sup>78</sup> In his *De officiis* (“On Duties”), Cicero eloquently explained the power of reason and freedom of man to affect his own destiny:<sup>79</sup>

Man is endowed with reason, by which he comprehends the chain of consequences, perceives the causes of things, understands the relation of cause to effect and of effect to cause, draws analogies, and connects and associates the present and the future, easily surveys the course of his whole life and makes the necessary preparations for its conduct.<sup>80</sup>

The Plotinian idea of the *homo faber* who can shape himself and dictate his own destiny in the manner a sculptor shapes his statue until it reaches “a godlike splendor of virtues”<sup>81</sup> is paralleled by the Roman adage *quisque faber fortunae suae*, “each person is the artisan of his own fortune.”<sup>82</sup> In Roman mythology, the god Janus was the protector of craftsmen guilds, and it is noteworthy that the theme of Janus *the* builder was reduced in Renaissance art to one as *the* ship-builder. In a painting attributed to Mantegna’s circle (15<sup>th</sup>-16<sup>th</sup> century), Janus is depicted as a *faber navalis* (shipwright) in the act of building a ship, with a plumb in his hand and the typical tools used by a shipwright: compass, square, hammer.

---

<sup>78</sup> The writings of Cicero (106-43 B.C.E.) were preserved in many manuscripts of the High Middle Ages. His *De officiis* was the second book to be printed after the invention of the printing press, and Cicero’s popularity in the Renaissance is indicated by the several editions of his works. Hankins and Palmer 2008: 43-45.

<sup>79</sup> The earliest printed copy in Venice of Cicero’s *De officiis* is dated to 1482, as indicated by an early catalogue of the Marciana Library (Venice) that was compiled at the end of the 15<sup>th</sup> century. This ethical treatise, based on Stoic moral teaching, was the last work that Cicero wrote, and he formulated in it his own moral philosophy. Colish 1978, 86.

<sup>80</sup> Cic. *Off.* 1.11: *Homo autem, quod rationis est particeps, per quam consequentia cernit, causas rerum videt earumque praegressus et quasi antecessiones non ignorat, similitudines comparat rebusque praesentibus adiungit atque adnectit futuras, facile totius vitae cursum videt ad eamque degendam praeparat res necessarias.* Translation by Miller 1913, 13.

<sup>81</sup> Plot. 1.6.9.

<sup>82</sup> Sallust. *Ad Caes.* 1.2.

On a practical level, the effects on human life of the theoretical teachings of Plotinus were conveyed to the Renaissance through two biographical works, Plutarch's *Vitae parallelae* ("Parallel Lives") and Valerius Maximus' *Facta et dicta memorabilia* ("Memorable Deeds and Sayings").<sup>83</sup> The *Vitae* collects 48 biographies on famous Greek and Roman personages, arranged in pairs, to educate on their common virtues or vices. Fausto recommends the reading of the *Vitae*, because "from Plutarch, we can learn extremely well the deeds and the sayings of illustrious men."<sup>84</sup> The *Memorabilia* compiles episodes and anecdotes about illustrious Greeks and Romans grouped according to their virtues and vices. Both Plutarch and Valerius Maximus showed that *virtus* actively operated on man through its effects. Both Plutarch and Valerius Maximus' works were a source of moral exhortation and guidance for all Renaissance men.

The impact of these two biographical works on the Renaissance system of values and mentality cannot be stressed enough. Not only did they awaken the interest for personal achievements and define the *virtus* as the noblest quality of human nature, but, more important, they shaped the idea in Renaissance mentality that through the imitation of a particular personage taken as an *exemplum*, and through the practice of the very same virtue, the same result would have been achieved. In other words, these works

---

<sup>83</sup> Plutarch (ca. C.E. 45-120) was probably the most popular Classical author in the Renaissance. The complete Latin translation of the *Lives* was one of the first books to be printed (1470) after the invention of the printing press. His works were introduced in Italy by Byzantine scholars, and Plutarch's works circulated both in Latin and Italian versions well before 1509. For the revival of Plutarch during the Renaissance, see Giustiniani 1961, 1-59; Hankins and Palmer, 2008: 14-15; Sofroniou, 2002, 101. The work of Valerius Maximus (ca. 20 B.C.E.-C.E. 50) was also available throughout the Middle Ages and the Renaissance in various copies.

<sup>84</sup> Fausto 1551, *Oratio quinta*, 75b: *Ex Plutarcho illustrium virorum egregie facta dictaque discimus.*

established the “principle of imitation” of the great models of the past and formed the innermost mental particle of the Renaissance for which the past, although gone, can be recreated and, thus, reborn.<sup>85</sup> It is not coincidental that in this period we witness, in Venice, the flourishing of a new literary genre based on the moral teaching of the ancients, such as the *De exemplis* by Giambattista Egnazio.<sup>86</sup>

Vettor Fausto knew extremely well the “Parallel Lives” and the “Memorabilia,” since his first oration bears direct *testimonia* of his acquaintance with these classical works. Fausto, indeed, recalls the deeds of the generals Themistocles, Horatius Cocles, and Mucius Scaevola, who were praised as champions of virtue by Plutarch and Valerius Maximus:<sup>87</sup>

There are many famous men who performed great service to their own country and were of great luster. Neither Themistocles, at Salamis, could have dared so much, nor Horatius could have defended the bridge, or Scaevola could have desired to remove his hand from the fire, if they were not persuaded by the example of the ancients. They could not deem anything more convenient for man than the pursuit of *virtus*, thanks to which they paved themselves with a way to glory and immortality.<sup>88</sup>

---

<sup>85</sup> In this regard, see Giustiniani 1985, 190-91. For a general overview on the reception of Plutarch’s *Lives* in fifteenth-century Italy, see the fundamental work by Pade 2007, and also Giustiniani 1979, 45-62.

<sup>86</sup> Giambattista Egnazio (ca. 1478-1553) was a renowned humanist. In 1518, two years after the departure of Marcus Musurus from Venice, Egnazio was one of the several candidates, together with Vettor Fausto, vying for the vacant lectureship in Greek literature. In 1520, after the death of Raffaele Regio, Egnazio obtained a public lectureship at the School of Saint Mark. He retained that post until he retired in 1549. See Ross 1976, 536-56.

<sup>87</sup> Themistocles (ca. 524-459 B.C.E.) was the famous Athenian politician and general who fought against the Persians at Marathon (490 B.C.E.), Artemisium (480 B.C.E.), and Salamis (480 B.C.E.), see: Plu. *Them.*; Val. Max. 5.3.3, 5.6.3., 6.5.2, 6.9.3, 8.7.14, 8.14.1. Horatius Cocles was the Roman general who prevented the Etruscans, commanded by Porsenna, from entering Rome by defending the bridge Sublicius on the river Tiber, see: Plu. *Publ.* 16; Val. Max. 3.2.1, 4.7.2. Mucius Scaevola was a young Roman nobleman who was freed by the Etruscans after Porsenna saw his stoic resistance to the fire, see: Plu. *Publ.* 17; Val. Max. 3.3.1.

<sup>88</sup> Fausto 1551, *Oratio prima*, fol. 14b: *Tot viri illustres, patriae suae magno usui, magnoque ornamento fuere. Neque enim, as Salamina, Themistocles tantum audere potuisset, neque Horatius pro*

Vettor Fausto's emphasis on the rhetorical hyperbole that the ancients were glorious and immortal because, in their turn, they imitated the *exempla* of previous generations, lies precisely in the Renaissance conviction that history is a perpetual cycle that reiterates itself, and that the past can be reborn. More interesting, it is possible to gauge from this oration how Fausto was deeply steeped in ancient moral values and how he profoundly believed in the effectiveness of the *exempla*. For Fausto, however, the greatest examples of virtue were those of the Greek philosophers because they exceed in *ratio* and *virtus* to such a degree of perfection that they represented *the* exemplary way of living (*ratio vivendi*).<sup>89</sup> During the Renaissance, the most important source of biographical information on ancient philosophers was Diogenes Laërtius' "Lives and Opinions of Eminent Philosophers." Arranged in ten books, Diogenes' oeuvre contained 82 short lives of philosophers from all schools of thought of antiquity.<sup>90</sup> Thus, Vettor Fausto praised Aristotle, Thales, Crantor, Democritus, Herillus, Aristo, and Zeno because they lived according to reason.<sup>91</sup>

Aristotle [...] affirms that perfect life lies in the teaching of Thales (to whom happiness smiled), because, in the practice of the *virtus*, he combined his soul, excellent in all respects, with good exercise of the body and abundance of things, namely fortune [...] In the same way, also Crantor, defender of the Old

---

*ponte stare, aut Scaevola manum igni admovere vultisset, sini antiquorum doctrinis persuasi, nihil magis hominem decere putavissent, quam sequi virtutem, et ea iter a gloriam, atque immortalitatem parare.*

<sup>89</sup> Fausto 1551, *Oratio tertia*, fol. 41a.

<sup>90</sup> The original Greek manuscript of the work of Diogenes Laërtius was brought from the Byzantine Empire in the 1420s by Giovanni Aurispa, and since 1433 a Latin version of the manuscript was available in the translation made by the Camaldolese monk Ambrogio Traversari. The Greek original was first printed in Rome in ca. 1472 and in Venice in 1497 by the Aldine press. See: Hankins and Palmer 2008, 62-63.

<sup>91</sup> The life of these philosophers are described in Diogenes Laërtius's *De clarorum philosophorum vitae* ("Life and Opinions of Eminent Philosophers"): Aristotle, book 5; Thales, 1; Crantor, 4; Democritus, 9; Herillus, Aristo, and Zeno, 7.

Academy and fourth after Plato, attributed to *virtus* the first role in human life, and secondly good health and good works, and other things that pertain either to body and fortune, as if he arranged everything according to their order. They, indeed, claimed that there is nothing in good living except glory. Therefore, many of them attended either to spiritual stillness like the ancient Democritus, the enquirer of nature, or to science like Herillus, or to excellence like Ariston, and like Zeno, the prince of Stoics, so to speak. They all highly esteemed the part that is greatest in us (*i.e.*, the *ratio*), and considered power of the mind to be unique and absolute.<sup>92</sup>

Interestingly, Vettor Fausto seems to embrace Stoicism because the concept of “to live in accord with reason” was the original formula of the Stoics (ὁμολογουμένως ζῆν, *omologumenōs zēn*).<sup>93</sup> This is not surprising, since Vettor Fausto published in 1511 an edition comprising four works by Cicero: the *De officiis* (“On Duties”), the *De senectute* (“On Old Age”), the *De amicitia* (“On Friendship”), and the *Paradoxa Stoicorum* (“Paradoxes of the Stoics”).<sup>94</sup> Although Cicero described himself as an Academic Skeptic, and his own philosophical position derives from that of his teacher Philo of Larissa, is not without sympathy for what he sees as the high moral tone of Stoicism. In many of his works he provides summaries and discussions of the views of the major school of Hellenistic thought. Cicero played an important formative role in the ethos of Venetian humanists, and, as shall be shown in the following pages, he

---

<sup>92</sup> Fausto 1551, *Oratio tertia*, fol. 41a: *Aristoteles [...] ex Thaletis prope sententia vitam perfectam (cui felicitas innitatur) esse dicit, quum ad animum undique eccellente., bona corporis habitudo, et rerum earum copia, quas fortunas appellant [...] exercendae virtutis accedat. Item at Crantor veteris academiae quartus a Platone defensor, primas vitae hominum partes virtuti attribuit, deinde bonam valitudinem atque opes, et alia quae aut corporis, aut fortunae dicuntur, suis quasi ordinibus cuncta disponit. Nam qui nihil in bonis esse constituunt, praeter gloriam, ut multi, aut animi tranquillitatem ut antiquissimus naturae indagator Democritus, aut scientiam ut Herillus, aut virtutem ut Aristo ac itidem fere stoicorum princeps Zeno, ii partem illam tantum, quae in nobis maxima est, atque vim mentis solam nudamque respiciunt.*

<sup>93</sup> D.L. *De clar. Phil. Vitae* 4.4.

<sup>94</sup> Fausto 1511, *M. T. Ciceronis tres de officiis libri, et aureum illud de amicitia senectuteque volumen vna cum paradoxis hoc habentur pugillari*. See Rhodes 1978, 60.

profoundly affected Fausto's life and writings. In his dialogue *De legibus* ("On the Laws"), in which he discussed the natural laws, Cicero affirmed that "the constant and continuous living in accordance with reason is virtue."<sup>95</sup> Indeed, a few lines later Cicero claims that "the perfection of reason is virtue, which is, of course, in natural law."<sup>96</sup> Thus, according to Cicero, nature likewise provided trees and horses with their own distinctive quality, "the very same nature also provided man not only with quickness of mind, but also with sense [...] and with a body apt and proper for human capacity."<sup>97</sup> And, "for while Nature has bent the other creatures down toward their food, she has made man alone erect, and has challenged him to look up toward heaven, as being, so to speak, akin to him, and his first home."<sup>98</sup>

Remarkably, Cicero's words found a perfect parallel in a passage from the *Oratio tertia*, in which Fausto named the specific qualities of various animals, and paraphrased the evocative image of man tending to the sky in a constant desire of acquiring knowledge:

As are horses naturally inclined to inhabit the plains, and dolphins to reach the surf, and eagles to soar to heights [...] so men have been created to reason and to understand – Nature considered it convenient as such– with their faces turned toward

---

<sup>95</sup> Cic. *Leg.* 1.44: *Constans et perpetua ratio vitae, quae est virtus.*

<sup>96</sup> Cic. *Leg.* 1.45: *Est enim virtus perfecta ratio, quod certe in natura est.* The same concept is in *Tusculanae quaestiones* (5.39): *Fit perfecta mens, id est absoluta ratio, quod est enim idem virtus* ("the mind shall be perfect, that is to say pure reason, which is indeed virtue itself.")

<sup>97</sup> Cic. *Leg.* 1.45: *Nam nec arboris nec equi uirtus quae dicitur [...] in opinione sita est, sed in natura* ("The distinctive quality of the tree and the horse is not based on a subjective opinion, but it is based on natural law."). The citation is from Cicero (*Leg.* 1.26): *Ipsam autem hominem eadem natura non solum celeritate mentis ornauit sed ei et sensus...figuramque corporis habilem et aptam ingenio humano dedit.*

<sup>98</sup> Cic. *Leg.* 1.26: *Nam cum ceteras animantes abiecisset ad pastum, solum hominem erexit et ad caeli quasi cognationis domiciliique pristini conspectum excitauit.* Translation by Keyes 1928, 325-7.

the sky [...] so through the faculties of their soul and through the powers of his mind, they can easily achieve *virtus*.<sup>99</sup>

That man is naturally inclined “to reasoning and to understanding” was again a concept that Fausto had drawn from Cicero, who asserted in his *De finibus bonorum et malorum* (“On the Ends of Good and Evil”), “So great is our innate love of learning and of knowledge that no one can doubt that man’s nature is strongly attracted to these things even without the lure of any profit.”<sup>100</sup> In the *De finibus*, a philosophical treatise in five books focused on Epicureanism, Stoicism, and Platonism, Cicero praised the Homeric hero Ulysses as an archetype for intellectually curious man drawn by the “desire to learn” (*discendi cupiditas*) to the rocks of the Sirens, whose songs were so appealing because they promised knowledge.<sup>101</sup>

The suggestive story of Ulysses, who had himself tied to the mast of his ship to hear the Sirens’ song, although he knew that doing so would have rendered him incapable of rational thought, became a literary *topos* in classical sources and conferred to Ulysses an astounding popularity.<sup>102</sup> The deconstruction of the myth of Ulysses, a notorious deceiver and a master of stratagems, is crucial to our discussion. However, before pursuing further our initial argument, which tended to read Vettor Fausto in

---

<sup>99</sup> Fausto 1551, *Oratio tertia*, fols. 40b-41a: *Admodum equi ad soli planitiem, delphini ad undas, aquilae ad sublimia tenenda nasci videtur [...] ita hominem ad ratiocinandum atque intelligendum, ore in coelo erecto, credi par est a natura, esse formatum [...] utpote quum ex eo facultatibus animi et ipsius mentis viribus ad capessendam virtutem atque honestatem magna subinde fieri possit accessio.*

<sup>100</sup> Cic. *Fin.* 5.18.48: *Tantus est igitur innatus in nobis cognitionis amor et scientiae, ut nemo dubitare possit, quin ad eas res hominum natura nullo emolumento invitata rapiatur.* The same concept that “man naturally desires knowledge” is reported by Arist. *Metaph.* 980a.22.

<sup>101</sup> Cic. *Fin.* 5.18.49.

<sup>102</sup> It has to be pointed out that the story of the Sirens was also interpreted, during the Renaissance, as the victory of man over the temptations of flesh.

philosophical terms, we should briefly delineate the profound impact that the figure of Ulysses had on Renaissance mentality.

Besides the wide circulation of Homeric poems during the Renaissance, the reappraisal of the Homeric hero began with the rediscovery of the works of Cicero and of the Stoics.<sup>103</sup> In his *Tusculanae disputationes* (“Tusculan Disputations”), a five-book work that attempts to popularize the Stoic philosophy, Cicero used Ulysses as an example of prudence (*prudentia*),<sup>104</sup> wisdom (*sapientia*),<sup>105</sup> and fortitude for his ability to withstand great pain.<sup>106</sup> Ulysses is considered by Horace to be the ideal model for the power of *virtus* and wisdom,<sup>107</sup> and Seneca advised his friend Lucilius to be wise as Ulysses.<sup>108</sup>

Thus, Renaissance Italy particularly praised the stoic and durable Ulysses for his self-governance, his self-control and discipline, his courage in the quest for knowledge, and his strength of character, which enable him to endure the trials he was obliged to undergo. More important, in Renaissance mentality, Ulysses was an allegorical figure, and his story represented the whole span of a man’s life. The humanistic projection toward Ulysses might have originated by the following passage from Seneca’s “Moral Letters:”

---

<sup>103</sup> Homer’s *Odyssey* was preserved in an eleventh-century Byzantine manuscript. The *editio princeps*, based on the Greek text edited by Demetrius Chalcondylas (1424-1511), a Greek émigré living in Florence, was printed in Florence I on 9 December 1488. In 1491, Pico della Mirandola (1463-1494) gave a copy of the *Odyssey* to the Venetian editor Aldus Manutius, who printed the first edition in Venice in 1504 (and reprinted it in 1517 and again in 1521). See Setton 1956, 59; Harris 1995, 58; Balsamo 2002, 174.

<sup>104</sup> Cic. *Tusc.* 1.98.

<sup>105</sup> Cic. *Tusc.* 5.7.

<sup>106</sup> Cic. *Tusc.* 2.49.

<sup>107</sup> Hor. *Ep.* 1.2.17-18.

<sup>108</sup> Seneca, *Ep.* 4.31.2.



Do you raise the question, “Through what regions did Ulysses stray?” instead of trying to prevent ourselves from going astray at all times? We have no leisure to hear lectures on the question whether he was tossed by the sea between Italy and Sicily, or outside our known world (indeed, so long a wandering could not possibly have taken place within its narrow bounds); we ourselves encounter storms of the spirit, which toss us daily, and our depravity drives us into all the ills which troubled Ulysses. For us there is never lacking the beauty to tempt our eyes, or the enemy to assail us; on this side are savage monsters that delight in human blood, on that side the treacherous allurements of the ear, and on the other side is shipwreck and all the varied category of misfortunes. Show me rather, by the example of Ulysses, how I have to love my country, my wife, my father, and how, even after suffering shipwreck, I am to sail toward these ends, honorable as they are.<sup>109</sup>

In light of the words of Paolo Ramusio on Fausto’s meager conditions and obscure origins, the panegyric that Vettor Fausto weaves in honor of the Greek hero, who stood and succeeded against his destiny, sounds autobiographical:

If a person acknowledges having little, or nothing, except the talent, [this person] should take as an example Ulysses, celebrated by the divine poet by twenty-four books, who, born in Ithaca – a place quite ignoble – from unknown parents, and who, in addition, could barely rely on his limited physical strength and resources, and who even suffered for the frequent hostility of the gods. Nonetheless, he overcame all these difficulties thanks to his *virtus*: the power of wisdom is so great that the glorious fame of his life is greater than that of anyone else, not only among the Greeks, but also among the inhabitants of the most distant boundaries of the earth. His reputation will immortalize his name.<sup>110</sup>

---

<sup>109</sup> Seneca *Ep.* 88.7: *Quaeris Ulixes ubi erraverit potius quam efficias ne nos semper erremus? Non vacat audire utrum inter Italiam et Siciliam iactatus sit an extra notum nobis orbem (neque enim potuit in tam angusto error esse tam longus): tempestates nos animi cotidie iactant et nequitia in omnia Ulixis mala inpellit. Non deest forma quae sollicitet oculos, non hostis; hinc monstra effera et humano cruore gaudentia, hinc insidiosa blandimenta aurium, hinc naufragia et tot varietates malorum. Hoc me doce, quomodo patriam amem, quomodo uxorem, quomodo patrem, quomodo ad haec tam honesta vel naufragus navigem.* 108. Translated by Gummerre 1920, 353.

<sup>110</sup> Fausto 1551, *Oratio tertia*, fol. 46b: *Quod, si quis parum, aut nihil, in bonis, praeter ingenium se habere conognoscit, ille sibi Ulysses ante oculos statuat, quattuor et viginti voluminibus a divino vate*

Thus, we propose to regard Fausto's parabola of life as the "odyssey" of every human soul through life: a larger metaphor of the human being who, despite a modest social condition and the adverse circumstances of life, was able to achieve great results and to improve his position through his intellectual capacity. It is the exultant victory of the *homo humanus* who freed himself from his subject status of medieval reminiscence and avails himself of the *ratio* to affirm his human nature and his mastership of the universe. Ultimately, this is the *novitas* of the Renaissance.

### **The *Studia Humanitatis*: Fausto at the School of Saint Mark and Early Literary Activity (1506-1512)**

The phrase *studia humanitatis*, which Cicero defined as "all the arts that pertain to civilization,"<sup>111</sup> survived Roman times, and, by the 14<sup>th</sup> century, it was adopted by humanists to indicate a specific educational program based on poetry, history, oratory, moral philosophy, and grammar. These literary disciplines were the subjects of study of the humanistic curriculum, which was based on ancient classical culture and was believed to provide the "perfect education that the Greeks call encyclopedic."<sup>112</sup>

It is important to note that the other academic disciplines of mathematics, logic, physics, and metaphysics, although they were also based on the authority of classical

---

*celebratum, qui natus Ithachae, loco satis ignobili, parentibus non admodum claris, quum et opibus, et sui corporis robore vix mediocritatem attingeret, atque etiam deorum aliquot haberet infensos, difficultates tamen omnes virtute rescidit: tantumque sapientia potuit, ut non modo apud suos rerum gestarum gloria nobilissimum quinque superaret, sed etiam in ultimos terrarum fines, nominis sui famam produceret.*

<sup>111</sup> Cic. *Pro Archia* 2.20: *omnes artes, quae ad humanitatem pertinent*. For the definition of the concept of *humanitas*, see discussion below.

<sup>112</sup> Egnazio 1554, 3: *perfectam eruditionem, quam Graeci ἐγκυκλιωπεδείαν appellant*. The citation is from the dedicatory epistle written by Marco Molino to Pier Francesco Contarini. Literally, the phrase ἐγκύκλιος παιδεία (*enkiklios paideia*) means "well-rounded education."

authors, such as, for example, Aristotle, Ptolemy, Strabo, and Pliny, were not included in the *studia humanitatis*. Thus, from the beginning, the *studia humanitatis*, which were established much earlier than the Scientific Revolution, were in opposition to the arts of natural science. The division between humanities and natural sciences had profound implications in Fausto's life. This cultural restraint determined the initial diffidence of the Venetian senators toward the construction of Fausto's quinquereme, and it can be regarded as the primary cause of all the anonymous accusations against Fausto, when he held the chair of Greek at the School of Saint Mark.

This matter will be discussed later in this chapter, and the dichotomy between humanities and science will be examined more closely in the chapter devoted to Fausto's Latin translation of the Aristotelian "Mechanics." For the moment, we shall focus the discussion on the *studia humanitatis*, and, in particular, examine the process through which humanists came to select those literary disciplines that were included in the humanistic curriculum. In doing so, the framework for the discussion on natural sciences and, in particular, on mechanics, will be defined.

The passage from the generic Ciceronian definition of *studia humanitatis* as "all arts" to the distinct literary disciplines of the humanistic curriculum was a long process that was already initiated in antiquity, was further elaborated during the Early Middle Ages, and eventually culminated in the 14<sup>th</sup> century. As Kristeller pointed out, the phrase *studia humanitatis* revived in the works of Coluccio Salutati, Pietro Paolo Vergerio,

Leonardo Bruni, and other 14<sup>th</sup>-century humanists.<sup>113</sup> This revival was due to the rediscovery by Francesco Petrarca (1304-1374), in 1333, in a monastery in Liège, of the *Pro Archia poeta oratio* (“Oration in Defense of the Poet Archia”) by Cicero.<sup>114</sup> In this oration concerning Archia’s right to Roman citizenship, Cicero takes the occasion “to speak a little more freely of the *studia humanitatis* and of the studies of *litterae*.”<sup>115</sup> Although neither *studia humanitatis* nor *studia litterae* receive an explicit definition in the works of Cicero, it is clear from their general context that Cicero meant liberal education.<sup>116</sup>

The phrase *studia humanitatis* evokes the concept of *humanitas*. It is worth examining briefly the Roman idea of *humanitas* here, especially because the interpretation of this word by modern scholarship has fueled the debate on Humanism.<sup>117</sup> The term *humanitas* appeared in Latin literature in the first century B.C.E., but it is only with Cicero that this concept reached its maturity. As Boyancé pointed out, in Cicero, *humanitas* assumed three different meanings.<sup>118</sup> *Humanitas* is used to indicate the moral value *par excellence* that enclosed the entire Roman system of traditional moral

---

<sup>113</sup> The earliest reference to the *studia humanitatis* is in a letter, dated 30 September 1369, written by Coluccio Salutati (1331-1406) to his friend Ugolino Orsini in occasion of the death of the latter’s father (Salutati 1.106). In: Novati 1891-1911, 1: 235. Later, Salutati extensively used the term *studia humanitatis* in his letters to describe the cultural achievements of his erudite friends (1.179, 229, 248; 2.54, 312; 3.330, 517, 559, 586; 4.119, 216).

<sup>114</sup> The humanistic curriculum was first promoted by the Florentine Francesco Petrarca (1304-1374). See Nauert 1995, 22-28 and especially the study of Proctor (1990, 814-18) and Kohl (1992, 187-94).

<sup>115</sup> Cic. *Pro Archia* 3.33: *de studii humanitatis ac litterarum Paulo loqui liberius*.

<sup>116</sup> Relevant passages in Cicero’s *Pro Archia* are: 1.1, 2.3, 3.5, 6.12, 6.13, 7.16, 9.19, and 12.32.

<sup>117</sup> The term “humanism” was first introduced in 1808, by Niethammer in his publication titled *Der Streit des Humanismus und Philanthropismus in der Theorie des Erziehungsunterrichts unserer Zeit* (Jena: F. Frommann). See Giustiniani 1985, 175.

<sup>118</sup> Boyancé 1970, 7-20.

values;<sup>119</sup> it is used to indicate universal human nature, a concept already present in Terence;<sup>120</sup> and, finally, it is used to refer to an educational system, or culture and civilization in a broader sense, as in Cicero's *Pro Archia*.<sup>121</sup> Recent scholarship has persisted in identifying the *studia humanitatis* with the concept of *humanitas* intended as the system of Roman moral values. As a result, the eminent scholar Jacob Burckhardt, followed by Eugenio Garin and Giovanni Gentile in Italy, Ernst Cassirer and Hans Baron in Germany, wrongly interpreted Humanism as the "new philosophy of man," in contrast with the medieval-Scholastics thought that was God-centered.<sup>122</sup> It was the merit of Paul Kristeller to have connected Humanism and the *studia humanitatis* with the idea of *humanitas* intended as a liberal education.<sup>123</sup> Once and for all, Humanism is an educational program based on the study of the classics, and not a philosophy or a cultural movement.

This is confirmed by Aulus Gellius (C.E. 125-180), who, in a passage of his "Attic Nights" explained the correct meaning of *humanitas*:

Those who have spoken Latin and have used the language correctly do not give to the word *humanitas* the meaning which it is commonly thought to have, namely, what the Greeks call φιλάνθρωπία (*philanthrōpia*), signifying a kind of friendly spirit and good-feeling towards all men without distinction; but they gave to *humanitas* about the force of the Greek παιδεία, that is what we call education and training in the liberal arts... That it is

---

<sup>119</sup> Cic. *Off.* 3.89.

<sup>120</sup> Cic. *Orat.* 1.53; *Off.* 1.13, 1.50, 3.46; and *Fin.* 5.26. Terence did not know the abstract noun *humanitas*, but he used the corresponding adjective *humanus*. In the comedy "The Self-Tormenter" (503), Terence wrote the famous principle: "I am a man and nothing that concerns a man do I deem a matter of indifference to me." (*Homo sum: humani nihil a me alienum puto*).

<sup>121</sup> *Supra* n. 114.

<sup>122</sup> Burckhardt 1904, 230; Gentile 1931; Garin 1965, 221; Gentile 1968.

<sup>123</sup> Kristeller 1979, 85-105.

in this sense that our earlier writers have used the word, and in particular Marcus Varro and Marcus Tullius [Cicero], almost all the literature shows.<sup>124</sup>

I believe that Aulus Gellius refers to two specific passages, respectively from *De oratore* (“On the Orator”) by Cicero, and from the *Disciplinarum libri IX* (“The Nine Books of Disciplines”) by Varro. In *De Oratore*, Cicero defined the *liberales doctrinae* that define the perfect orator: geometry, music, “good letters” (grammar and rhetoric), poetry, dialectics, and philosophy.<sup>125</sup> However, the earliest systematic organization of the Roman liberal arts was expounded in the now lost compendium of Varro (116-27 B.C.E.), entitled *Disciplinarum libri IX*, composed around 40 B.C.E. Varro organized the liberal arts in nine disciplines in the following order: grammar, dialectics, rhetoric, geometry, arithmetic, astronomy, music, medicine, and architecture.

The Varronian model of the nine disciplines was later transformed into the medieval *trivium* (grammar, dialectics, and rhetoric) and *quadrivium* (geometry, arithmetic, astronomy, and music). Since the establishment of the medieval education system of *trivium* and *quadrivium*, architecture and medicine were not included, but were considered mechanical arts. More precisely, they were considered servile because they involved manual activity, as opposed to the liberal arts that required mental effort. The passage from nine Varronian disciplines to the seven liberal arts is documented by

---

<sup>124</sup> Aul. Gel. *Noct. act.* 13.17: *Qui verba Latina fecerunt quique his probe usi sunt, humanitatem non id esse voluerunt, quod vulgus existimat quodque a Graecis φιλανθρωπία dicitur et significat dexteritatem quandam benivolentiamque erga omnis homines promiscam, sed humanitatem appellaverunt id propemodum, quod Graeci παιδεία vocant, nos eruditionem institutionemque in bonas artis dicimus...Sic igitur eo verbo veteres esse usos et cumprimis M. Varronem Marcumque Tullium omnes ferme libri declarant.* Translation by Rolfe 1927, 457.

<sup>125</sup> Cic. *Orat.* 3.15.58, and 3.32.127.

Saint Augustine (C.E. 354-430), who may be regarded as the *trait d'union* between the Late Roman period and the Early Middle Ages. In 387, Saint Augustine wrote the *Disciplinarum libri*, which was modeled upon the compendium of Varro. Saint Augustine included in his educational program the seven arts: grammar, dialectics, rhetoric, geometry, music, arithmetic, and philosophy.

A further step in the establishment of the liberal arts curriculum, in Ostrogothic Italy, was made by Boethius (C.E. 480-524), Martianus Capella (fl. C.E. 410-39), and Cassiodorus (ca. C.E. 485-573). Boethius, in the preface of the first book of his *De institutione arithmetica* ("Treatise on Arithmetic"), coined the term *quadrivium* for arithmetic, geometry, astronomy, and music.<sup>126</sup> Boethius's main source for the division of mathematics into four disciplines was Nicomachus of Gerasa's *Introductio arithmeticae* ("Introduction to Arithmetic"), first translated into Latin by Apuleius (C.E. 120-180). Nicomachus, a Neo-Pythagorean, distinguishes the mathematical disciplines in "four ways" (τεσσαρες μεθοδοι, *tessares methodoi*).<sup>127</sup>

Cassiodorus, a minister of Theodoric who became a monk around C.E. 544-545, wrote a work entitled *De institutione divinarum litterarum* ("Institutions of Divine and Secular Learning"). Cassiodorus, in his second book, discussed the seven liberal arts that he arranged under the headings *trivium* and *quadrivium*. Cassiodorus was influenced by both Boethius and Martianus Capella. Martianus, in his allegoric poem titled *De nuptiis*

---

<sup>126</sup> Boethius (*De inst. arith.* 1.23-6) claimed that full mastery of the disciplines of learning can be attained only through a four-fold path: "...hardly anyone has been able to reach the highest perfection of the disciplines of philosophy unless the nobility of such wisdom was investigated by him in a certain four-path, the quadrivium" (*quemquam in philosophiae disciplinis ad cumulum perfectionis evadere, nisi cui talis prudentiae nobilitas quodam quasi quadrivio vestigatur*).

<sup>127</sup> Nicom. *Ar.* 1.1-5.

*Philologiae et Mercurii* (“The Marriage of Philology and Mercury”) portrayed the seven liberal arts in the person of seven bridesmaids giving an account of themselves during the heavenly wedding banquet. With regard to *quadrivium*, particularly interesting is the idea promoted by Cassiodorus but already present in the Pythagorean writings, that numbers are the key to penetrating the mysteries of Scriptures and to read the mind of God. This is the reason why, during the Renaissance, theological studies were wedded to mathematical disciplines.

Cassiodorus’s “Institutions,” and, to some extent, also the work of Boethius and Martianus Capella, became the basis of the liberal arts curriculum during the Middle Ages. They were read as school texts, together with another important source, the *Etymologiarum libri XX* (“The Twenty Books of Etymologies”) by Isidore of Seville (C.E. 560-636), who offered, in his third book, a detailed discussion of *quadrivium*. In the schools of medieval Italy, the liberal arts curriculum began with the study of *trivium*, comprising more elementary subjects, and was completed with the *quadrivium*, which was reserved for more advanced students. After 1500, this Italian educational model based on the study of humanities was adopted by France, Spain, Germany, and England.<sup>128</sup>

Both the *trivium* and *quadrivium* were parts of the liberal arts education during the Renaissance. In 1402/1403, Pietro Paolo Vergerio The Elder (1370-1444), in his treatise titled *De ingenuis moribus et liberalibus studiis adulescentiae* (“On the Noble Character and Liberal Studies of Youth”), defined liberal arts studies as “those that are

---

<sup>128</sup> Grendler 1990, 775-9.



worthy of a free man.”<sup>129</sup> Vergerio accorded the first place to history, and he then listed all the other subjects: moral philosophy, eloquence, the art of letters with grammar and rhetoric, poetry, music, arithmetic, geometry, and astronomy. “It must not be supposed” – Vergerio reassures – “that a liberal education requires acquaintance with them all, for a thorough mastery of even one of them might fairly be the achievement of a lifetime.”<sup>130</sup>

A description of the liberal arts is also provided by Vettor Fausto in his second oration delivered in November 1520, and occasioned by the request for a salary raise for his service at the School of Saint Mark. For Fausto, the liberal arts consisted of the study of grammar, which included the principles of correct writing (*ratio recte scribendi*); oratory and rhetoric, which provided pupils with the principles of correct discourse (*ratio recte loquendi*) and perfected their skills in delivering public declamations (*consuetudo declamandi*); poetry and literature, as tools to improve the techniques of exposition (*enarratio*) and to expand the vocabulary; and, a full knowledge of history (*historiarum plena cognitio*). To these subjects, Fausto added mathematics, astronomy, and geometry, which are “disciplines so connected to each other that one serves the other.”<sup>131</sup> Music and arithmetic, Fausto argued, are related disciplines, since “hardly anyone can be called a musician without the full knowledge of numbers.”<sup>132</sup> Finally, Fausto included in the humanistic curriculum moral philosophy, and asserted that “ethics

---

<sup>129</sup> Vergerio’s *De ingenuis moribus* has been fully translated by Craig Kallendorf (2002, 2-91). The citation is from page 29: *Liberalia igitur studia vocamus, quae sunt homine libero digna.*

<sup>130</sup> Vergerio 3.46: *Non quo unicuique omnes necessario apprehendendae sint, ut doctus tandem aut sit aut habetur, nam et singulae totum sibi hominem vendicare possunt.* In: Kallendorf 2002, 56.

<sup>131</sup> Fausto 1551, *Oratio secunda*, fol. 23a: *Hae nanque doctrinae ita inter se coniunctae sunt, ut una alteri serviat.* The original text mentions “astrology” and not “astronomy.” However, it is clear from the context of the text that Fausto meant the latter.

<sup>132</sup> Fausto 1551, *Oratio secunda*, fol. 23a: *Non facile quisquam musicus sine exacta numerorum cognitione dicatur.*

(*morum scientia*), which governs the youth in public, not only should be perfectly mastered, but should always be part of the curriculum of life.”<sup>133</sup>

By the 14<sup>th</sup> century, the liberal arts were divided into two different streams of study: the humanistic curriculum or *studia humanitatis*, and the mathematical/natural science curriculum or *studia rationis/studia secretorum naturae*. In a letter dated to April 1402 and addressed to the Lucchese chancellor Guido Manfredi da Pietrasanta, Salutati wrote that the ideal educational program should combine “the study of the humanities, the study of the secrets of nature and [...] the study of mathematics.”<sup>134</sup>

This division of knowledge was based upon the medieval *trivium* and *quadrivium*. The *studia humanitatis* of the Renaissance, however, resulted from an expanded version of the medieval *trivium*. The three medieval disciplines of grammar, rhetoric, and dialectic joined, during the Renaissance, the study of poetry, literature, moral philosophy, and history. My main concern here is to investigate the process through which 14<sup>th</sup>-century humanists came to select those literary disciplines as part of the humanistic curriculum, and excluded the mathematical disciplines belonging to the *quadrivium*.

I believe the answer to this question lies precisely in the judgment of two of the most authoritative humanists, Francesco Petrarca (1304-1374) and Leonardo Bruni (1370-1444). Petrarca was considered “the man who restored the humanities at a time

---

<sup>133</sup> Fausto 1551, *Oratio secunda*, fol. 23a: *Mitto morum scientiam, quae publico iuventutis moderatori, non solum debet esse notissima, verum etiam semper toto vitae curriculo.*

<sup>134</sup> Salutati 3.586: *Studia quidem humanitatis secretorumque nature et [...] studia rationis*. In: Novati 1891-1911, 3: 487.

when they had become extinct,<sup>135</sup> and he identified the humanistic disciplines as his particular area of interest. This is evident from his own list of books, which are divided by subject and among which Cicero's rhetorical and philosophical works have a place of honor.<sup>136</sup> Seneca's moral writings and tragedies ranked second. Petrarca owned Aristotle's *Ethics* and *Politics*, and the works of Boethius. Under the heading of history are listed the works of Valerius Maximus, Livy, Svetonius, Macrobius, and Gellius. For poetry, Petrarca listed Virgil, Lucan, Statius, Horace, and Ovid, whereas under grammar the treatises of Priscian, Papias, and Donatus are included. Under dialectic, Petrarca listed a *tractatus* that has to be identified probably with the third book of Cassiodorus's *De institutione*.<sup>137</sup> Thus, Petrarca implicitly suggested that the selected quintet of disciplines provided an ideal education. In determining the humanistic curriculum, in which it should be noted that mathematical disciplines were excluded, the opinion of Bruni seems to be decisive. In his *De studiis et litteris* ("On Study and Literature"), a long letter addressed to Battista di Montefeltro of noble birth, Bruni urged the woman to avoid the subtleties of mathematical disciplines. Bruni noted that mathematical disciplines are not worthy of a cultivated mind, "There are disciplines, which are not fitting to ignore completely, yet by no means glorious to completely master. In geometry and arithmetic, for example, if one should waste a great deal of time worrying about their subtle obscurities, I would seize him and tear him away from them."<sup>138</sup> However,

---

<sup>135</sup> Baldassarri 1994, 94: *Hic vir studia humanitatis, quae iam extincta errant, reparavit.*

<sup>136</sup> The list of Petrarca's books is published by Ullman (1955, 118-23).

<sup>137</sup> Ullman 1955, 122.

<sup>138</sup> Bruni *De studiis et litteris*, 13: *Sunt enim disciplinarum quaedam, in quibus ut rudem omnino esse non satis decorum, sic etiam ad cacumina illarum evadere nequaquam gloriosum; ut geometria et*

the *studia humanitatis* were considered to represent the ideal education because they “perfect and adorn the man,”<sup>139</sup> as Brunni wrote, and it was believed to also convey moral values.

In Venice, the division of liberal arts between the humanistic curriculum and the natural sciences curriculum was mirrored by the two main institutions: the School of Rialto, which was active in 1408, and the School of Saint Mark, which was founded in 1443.<sup>140</sup> The School of Rialto (*Gymnasium Rivoaltinum*) centered its curriculum on mathematics, logic, metaphysics, astronomy, natural philosophy, science, and theology. In contrast, the School of Saint Mark (*Gymnasium literarium*) focused on grammar, rhetoric, Latin and Greek language, with an emphasis on philological and linguistic analysis.<sup>141</sup>

The *gymnasium literarium*, located “in Saint Mark square, close to the bell tower,”<sup>142</sup> was established on 16 April 1443 for “children and the young boys of Venice, who are twelve years old or older [...] who want to learn grammar, rhetoric and other

---

*arithmetica, in quibus, si multum temporis consumere pergat et subtilitates omnes obscuritatesque rimari, rethraham manu atque divellam.* In: Kallendorf 2002, 104-5.

<sup>139</sup> Brunni, letter to the Florentine nobleman Niccolò Strozzi: *perficere hominem*, Baldassarri 1994, 7.

<sup>140</sup> ASVe, Maggior Consiglio, Deliberazioni, Ursa, fol. 144r (16 April 1443). See discussion below.

<sup>141</sup> Lepori (1980, 604) suggested that “the difference between the *gymnasium rivoaltinum* and the School of Saint Mark...was...the difference between theoretical research (logic, in particular) and linguistic, philological, and historical research.” The Renaissance term for attending school was the casual *stare a dozzina*, which literally means “to be in twelve.” But this humble term, not suited for a higher education, was later substituted with the more appealing *gymnasium* of ancient Greek reminiscence. The School of Rialto is called by Sabellico (1495, Regio I, 9) *philosophiae gymnasium*.

<sup>142</sup> Sanuto [Fulin, 1880, 51]: *a San Marco, a presso il campaniel*. For the history of the School of Saint Mark and its teachers, see also: Gozzi 1849, 2: 303-305; Romanin 1856, 4: 498-500; Paternoster 1883, 12-16; Cecchetti 1886, 343-57; Foffano 1892, 456-57; Segarizzi 1915-1916, 637-45 and 650-52; Nardi 1971, 31-51; Ross 1976, 526-27; Lepori 1980, 600-605; Labalme 2008, 429-78.

subjects useful for the Chancellery, and how to write well.”<sup>143</sup> The School of Saint Mark was specifically intended “to adequately supply the Chancellery with notaries at any time or place, inside or outside the city.”<sup>144</sup> Twelve students were admitted to the School each year and subsidized by the Venetian Republic with an “annual scholarship in the amount of ten ducats.”<sup>145</sup> The School of Saint Mark was originally created as a high school, but as early as the beginning of the 16<sup>th</sup> century it had evolved into a university-level institution.<sup>146</sup> Indeed, despite the difficult start of the School after its foundation,<sup>147</sup> the School now seemed completely grounded and the number of students increased to sixteen.<sup>148</sup>

On 7 March 1460, the Senate added to the previous “chancellery chair” a second chair of humanities. For this position, the Senate appointed Gianmario Filelfo “who has to deliver daily two good public lectures, one in poetry, and the other in rhetoric or history, so that, thanks to his teaching, the nobles, the sons of nobles and of citizens can benefit from the studies and become learned.”<sup>149</sup> Although the School of Saint Mark was specifically designed for students who would have become notaries and secretaries of

---

<sup>143</sup> ASVe, Maggior Consiglio, Deliberazioni, Ursa, fol. 144r (16 April 1443): *pueri seu iuvenes Veneti ab annis duodecim vel circa supra, cum salario ducatorum decem pro quolibet in anno [...] discant gramaticam, rethoricam et alias scientias aptas ad exercitium Cancellariae ac bene scribere.*

<sup>144</sup> Segarizzi 1916, 641-42.

<sup>145</sup> ASVe, Maggior Consiglio, Deliberazioni, Ursa, fol. 144r (16 April 1443): *cum salario ducatorum decem pro quolibet in anno.* However, five ducats were withheld from each of the students in order to pay the teachers. Ross 1976, 527.

<sup>146</sup> Grendler 1985, 201.

<sup>147</sup> The Senatorial decree of 7 June 1446 recorded that “many of the students neither attend the school nor learn, and, since they failed to attend the tutored classes, the number of students is insufficient to cover their expenditure, which renders it useless and unsuccessful” (*multi eorum non vadunt ad scholas nec adicunt, et, deffectu preceptoris, efficient insufficientes, et expensa que sit in eis est inutilis et infructuosa*). In: ASVe, Senato terra, reg. 1, fol. 193r.

<sup>148</sup> Segarizzi 1916, 643-48.

<sup>149</sup> *Obligatus sit legere cotidie duas dignas lectiones publice, unam scilicet in poetica, alteram in arte oratoria aut historia, ut sub eo et ius disciplina nobiles et filii nobilium et civium nostrorum operam dare studiis et docti evadere possint.* Segarizzi 1916, 650.

the Chancellery, the necessity to provide young members of the prospective ruling class with a solid and homogeneous humanistic education urged the Senate to expand the curriculum by adding a Greek lectureship. Thus, in 1504, the Senate decided to elect “...in the city of Venice an honest and clever teacher [...] who has to lecture on Greek authors in a suited course, which is necessary to introduce the pupils to the study of humanities.”<sup>150</sup> This newly-appointed third chair was Niccolò Leonico of Vicenza, who held the position from 1504 to 1506.<sup>151</sup> By the first half of the 16<sup>th</sup> century the *studia humanitatis* at the School of Saint Mark became synonymous with classical education, and the humanities became the ideal instrument for forming a complete man and a perfect citizen.

In Venice, Aldo Manuzio and his New Academy of the *Philellenes* promoted the ideal humanities curriculum that combined both the study of Greek and Latin.<sup>152</sup> The idea that the Greco-Roman koiné was *the* culture for a perfect citizen has been advocated also by Vettor Fausto in his “Five Orations.” For Fausto, the study of both Greek and Latin languages held such paramount significance that they shaped and refined the “features of the soul” (*animi lineamentis*).<sup>153</sup>

The great success of the humanities in Venice resulted from a series of favorable circumstances, which dotted the 15<sup>th</sup> and 16<sup>th</sup> century, such as the donation of

---

<sup>150</sup> ASVe, Senato terra, reg. 15, fol. 36r: *eligatur unus probus et idoneus vir [...] teneatur etima legere in hac urbe nostra auctores graecos per commodam lectionem et veluti necessariam ad introductionem studiorum humanitatis.*

<sup>151</sup> Sanuto, VI, col. 117 and 433. Niccolò Leonico of Vicenza is often confused with the more famous scholar Niccolò Leonico Tomeo (1456-1531), who taught at the University of Padua from 1497 to 1506, and published, in 1525, a Latin translation of the pseudo-Aristotelian *Quaestiones mechanicae*, which was primarily based on Fausto’s edition of 1517; Rose and Drake 1971, 78-9; Grendler 2002, 273-74.

<sup>152</sup> Lowry 1976, 378-85; Pertusi 1980, 3: 177-264; Margolin 2002, 203; Celenza 2009, 155-57;

<sup>153</sup> Fausto 1551, *Oratio prima*, fol. 15a.

Bessarion’s library, the Aldine press, the growing interest in antiquarian and philological studies, and the presence of many émigré Greek scholars in Venice just to mention a few. “Thou, noble Senators” – Fausto proclaimed in 1519 – “are the lords of Greece, thou have not only so many Greek books and relics of the august past, but also excellent and great printing houses for the Greek language, thou bring here professors from other regions of Italy.”<sup>154</sup> The Aldine press played a pivotal role in the spreading of classical culture. In 1495, Aldo Manuzio published a Latin translation of the Greek grammar by Constantine Lascaris. In 1497 he published the first Greek dictionary (*Dictionarium graecum*) by Giovanni Crastone, followed by *Grammaticae institutiones graecae* (“Treatise on Greek Grammar”) by the Franciscan friar Urbanus Bolzanius. Urbanus’s grammar became so popular during the 16<sup>th</sup> century that it was reprinted 23 times.<sup>155</sup> For the 1512 edition of Urbanus’ *Grammaticae Institutiones*, published by Joannes de Tridino (Tacuino), Fausto wrote a Greek epigram.<sup>156</sup>

Despite the many Greek grammar books and lexica available, it required nearly a century for Greek studies to become permanently rooted in Venice. Even so, at the beginning of the 16<sup>th</sup> century, Greek was studied less than Latin.<sup>157</sup> How can one not share the bitterness of Fausto when in 1520 he lamented before the Senate about the paucity of scholars proficient in Greek? Fausto complained, “In Venice, there are more

---

<sup>154</sup> Fausto 1551, *Oratio secunda*, fol. 31a: *Vos autem o magnanimi patres, quum terrae graeciae domini sitis, graecorumque librorum non solum ingentem numerum, antiquitatis venerandae reconditum habeatis, sed etiam maximas atque optimas officinas graecarum litterarum, professori qui ab alii Italiae populis ducentos.*

<sup>155</sup> Balsamo 2002, 180. In the 1512 edition, Fausto wrote a poem in Greek elegiac couplets.

<sup>156</sup> Dalle Fosse, Urbano Bolzanius, *Urbani Bolzani Grammaticae institutiones iterum perquam diligenter elaboratae. Impressum Venetiis: sumptu miraque diligentia Ioanis de Tridino alias Tacuino, 1512 die XX. Augusti.*

<sup>157</sup> Ciccolella 2008, xiii-xvi.

*baili* than harp-players (*citharoedi*);<sup>158</sup> and men who bring grain from Greece and wine from Crete are much more numerous than those who are able to speak Greek.”<sup>159</sup>

Classical culture permeated the lives of Venetian citizens despite the fact that few *litterati* were able to speak and write in Greek and Latin. In a maritime city like Venice, situated at the center of Mediterranean trade and diplomacy, humanities became a *modus vivendi*, a true paradigm of life. The close alliance shared among the humanities, politics, and society, is particularly evident when one considers the diplomatic system Venice developed in the Renaissance. More than the other Italian cities, Venice regarded the study of ancient cultures not as an *otium* – an intellectual activity to pursue a life of leisure – but rather as a *negotium*, a stimulus to act in civic life. As international statesmen, Venetians may be considered inventors of the art of diplomacy. Rhetoric, eloquence, the ability to persuade a political opponent and to make new alliances, or the finesse to accommodate difficult situations were all skills required of politicians and representatives of the Republic.<sup>160</sup> Quintilian (ca. C.E. 35-100) wrote

---

<sup>158</sup> In ancient Greece, the *citharoedus* was a professional singer who performed poetry in the company of a cithara or lyre. By *citharoedi*, Fausto obviously means people who are able to read Greek, whether poetry or not.

<sup>159</sup> Fausto 1551, *Oratio secunda*, fols. 28b-29a: *Immo, plus etiam refert baiulos esse Venetiis quam citharoedos, reperiri que multos, qui graecum ex Achaia frumentum, aut vinum e Creta insula vehant, quam qui graecam possint agere fabulam: veruntamen non quantum quisque utilitatis in publico, afferat, sed quanti ipse fit, spectare debemus. Magnum est igitur quascunque litteras scire, maximum autem quod ex earum pene omnium cognitione constat, tantam personam, quanta grammatici est, publice sustinere. Quid ergo, id non latine solum, sed etiam graece cum dignitate praestare? Quippe, is, qui graece hac tempestate docet, omnia cum latinis habet communia, praeterquam quod, ut latinis auditoribus operam suam accomodet, necesse est prius latina faciat singula, quae expositurus sit, quam quicquam enarret. Hoc autem nemo possit, nisi qui utriusque linguae proprietatem optime calleat. Quam ob rem si grammatici altera tantum lingua praestantes, summum in litteris obtinent gradum, vix exprimi potest, quanta esse debeat eius auctoritas, qui ex hoc loco latinis graeca coniugat.*

<sup>160</sup> A humanistic training was required for Venetian diplomats. For example, the *bailo* Bernardo Navagero (1550-1552), the future cardinal, studied at the University of Padua and in Venice; Nicolò Barbarigo (1577-1579) studied rhetoric and philosophy in Padua, as did Francesco Contarini (1602-1604) and Simone Contarini (1608-1612).



that “the *orator* is a good man skilled in the art of speaking,”<sup>161</sup> and Fausto asserted that only he who mastered both Greek and Latin was worthy to be considered an orator.<sup>162</sup>

During the Renaissance, the oratorical treatises of Cicero and Quintilian nourished rhetorical theory. In 1505, during his lectureship in Venice, Gerolamo Maserio edited and published three rhetorical works by Cicero: the *Orator ad Brutum* (“About the Orator, to Brutus”), the *Topica* (“Topics”), and the *Partitiones oratoriae* (“On the Divisions of Rhetoric”).<sup>163</sup> In his rhetorical writings, Cicero expounded rhetorical theory on the perfect orator.<sup>164</sup> The idea of the broadly educated, literary, and philosophical orator that Cicero tried to promote found an echo in Quintilian. He provided the perfect educational system that combined eloquence and moral philosophy for civic life in his *Institutio oratoria* (“Treatise on Rhetoric”).<sup>165</sup>

Fausto began his *studia humanitatis* at the prestigious School of Saint Mark, in Venice, probably in 1506.<sup>166</sup> This assumption is based on archival sources and on the short biography of Fausto compiled by Paolo Ramusio. Ramusio depicted Fausto almost

---

<sup>161</sup> Quint. *Inst.* 12.1.1: *Orator vir bonus dicendi peritus.*

<sup>162</sup> Fausto 1551, *Oratio secunda*, fol. 21a.

<sup>163</sup> Gleditsch 1741, 502; Concina 1990, 26. The title of Maserio’s edition of Cicero is: *Opera M. Tulli Ciceronis partitiones oratoriae: Orator ad Brutum Topica*. The *Orator* was first published in Rome in 1469.

<sup>164</sup> The *Orator*, which is addressed to his friend Brutus, is a labored defense of Cicero’s favorite notion that a perfect orator needs to possess an almost universal knowledge. The *Topica* is a compendium of topics presumably drawn from Aristotle’s *Topica*, and is one of the major canonical texts on ancient rhetorical theory. The *Partitiones oratoriae* focuses on the proper arrangement of the parts of a speech and presents the orator as the master of all language communication.

<sup>165</sup> Quintilian’s *Institutio oratoria* was fully recovered by Poggio Bracciolini in 1461. In Venice, Quintilian became the revered authority behind the humanities education, the main pedagogical text for the learning of Latin was the *Institutiones grammaticae Latinae* (“Principles of Latin Grammar”) printed by Aldus Manutius in 1493, which was largely based on Quintilian’s *Institutio oratoria*. See Kristeller 1979, 245.

<sup>166</sup> Likely, Fausto started his *curriculum studiorum* much earlier than 1506, and he must have attended both the elementary and secondary school. Given the economic conditions of Fausto’s family, Fausto probably attended the free church school overseen by the parish priest. The church/parish school provided pupils with a humanities education and prepared them for the university.

as an *enfant prodige* for “he was, already in his childhood, so eager and devoted to the study of Latin and especially of Greek that is impossible to believe, and certainly there was no more famous orator, mathematician, or philosopher that could have contended with him in the desire of learning, even though he suffered from the many difficulties in his family.”<sup>167</sup> Ramusio stated that Fausto started his humanities education at the School of Saint Mark under Gerolamo Maserio, “from whom he learnt Greek so well that, in his turn, he easily taught it to other students.”<sup>168</sup> The professional relationship between Fausto and Maserio, however, went beyond the walls of the School, and Fausto became “such an inseparable companion of Hieronimo Maserio that he was always at his side.”<sup>169</sup> We know that Fausto, while assisting his teacher in the gathering of Greek texts, lived in Maserio’s house. In an autographed manuscript dated to 1508/1509 and containing the tragedies by Aeschylus, Fausto wrote thus: “During the year when I was 18 years old, while I was living in the house of Maserio, I hourly copied the paraphrase by the grammarian Johannes Tzetze on Dionysus [Periegetes], and some anepigraphic commentaries on Aeschylus.”<sup>170</sup>

---

<sup>167</sup> Fausto 1551, *Dedicatio*, fol. 2b: *iam inde a prima pueritia latinarum litterarum, atque adeo graecarum suora etiam quam credi possit, cupidus ac studiosus. Nullum certe paulo clariorem aut rhetorem, aut mathematicum, aut philosophum ea aetas tulit, quem ille, quantum res domestica patiebatur, non affectari et audire contenderit.* The School of San Marco was located in Terra Nova, an area behind the Marciana Library in Saint Mark’s square (approximately where the modern Royal Gardens are now). In the Terra Nova area were located some boatyards, which were demolished in the 14<sup>th</sup> century to house the offices of the Magistrato alla Sanità (Magistracy for Health), the Magistrato delle Legne (Magistracy for Wood Supply), and the Fondaco della Farina (Flour Warehouse). See: Tassini 1863, 426.

<sup>168</sup> Fausto 1551, *Dedicatio*, fol. 3a: *a quo ita ipse graece disceret, ut deinde alios docere facile posset.*

<sup>169</sup> Fausto 1551, *Dedicatio*, fols. 2b-3a: *tam assiduus comes haesit, ut ab illius latere nunquam discederet.*

<sup>170</sup> BNN, Neap. II.F.30, fol. 1r: *Anno aetatis meae 18 cum Maseri domum habitarem: Dion[ysium]/et Eschylum ad clepsydram exscriberem ex paraphrasi Ιωάν(νου)/τοῦ γραμματικοῦ τοῦ Τζέτζου in Dionysium, et ex Eschyli [commenta]riis ἀνεπιγράφοις.*

Maserio taught at the School of Saint Mark from 1503 to 1509, the year in which he fled from Venice after making a false astrological prediction at the outset of the war of the League of Cambrai. For the entry dated 8 June 1509, Sanuto recorded the episode: “Hironimo from Forlì, who was lecturing in this city at Terranova near Saint Mark, and who was astrologer, predicted many events, and also that we should have surely won. Everybody believed him. Now, since his prediction proved false, in these days he left for Forlì.”<sup>171</sup> He arrived in Venice toward the end of 1503, after he taught at the university of Rome and Perugia. Maserio’s arrival in the Venetian lagoon must be connected with some services he had previously rendered in Rome for the Republic while attending the apostolic legate of Hungary.<sup>172</sup> The lectureship at the School of Saint Mark was not an easy position to achieve, but Maserio’s appointment represents the current trend in Renaissance Venice in that the elections were always driven by influential people among the noble elite. Indeed, Maserio could rely on the protection of a group of young patricians led by Gabriel Moro who enthusiastically attended his lectures during Maserio’s experimental readings. “Many young patrician scholars and others” – recorded Sanuto on 17 November 1503 – “who are interested in learning, arrived in the Collegio, and Ser Gabriel Moro made a speech in vernacular on behalf of the group. He exhorted the Signoria to hire as lecturer don Gerolamo Maserio from Forlì, who has come from Hungary and is very learned, and for 24 days has been trying out as a

---

<sup>171</sup> Sanuto, VIII, col. 384: *Hironimo di Forlì, qual lezeva in questa terra, a San Marco in terra nuova, et era astrologo, havia predito molte cosse, e che si aria vittoria omnino, et molti li credeva; or, visto la cossa contraria, in questi zorni si partite et andò a Forlì.* Although teachers were required to give free annual predictions (*iudicia*), I believe that Maserio’s prediction has to be connected with the many prophecies that circulated during the crucial years of the war of the League of Cambrai. See discussion below.

<sup>172</sup> Sanuto, V, col. 592.

lecturer.”<sup>173</sup> On 22 November 1503, the Senate finally yielded to pressure from Maserio’s devotees and announced a competition for the public chair, and, after the vote, the chosen candidate was *Dominus Hieronimus Foroliviensis, doctor*.<sup>174</sup>

Maserio was highly praised by his contemporaries for he was “extremely erudite in sciences, fluent in reading, and finely cultivated.”<sup>175</sup> On 24 August 1505, he published an edition containing some rhetorical works by Cicero: “The Division of Oratory,” The Orator,” and the “Topics.”<sup>176</sup> This Ciceronian was printed by Giovanni Battista de Sessa, a Milanese printer working in Venice who cooperated with the typographer Giacomo Penzio, the same typographer who also cooperated with Lazzaro Soardi.<sup>177</sup>

In 1503, when Maserio began teaching, the School had in total three chairs: the first chancellery chair (established in 1443), the second chair of humanities (1460), and the third chair of Greek (1504). Maserio was specifically appointed to the chancellery chair that became vacant after Gregorio Amaseo was dismissed by the Senate in 1502.<sup>178</sup> The second chair of humanities was held by Marcantonio Sabellico, who left in 1505, whereas the chair of Greek was held by Nicolò Leonico from Vicenza, who resigned from his post in 1506.<sup>179</sup> Thus, from 1506 to 1509, Maserio remained the only teacher at the School of Saint Mark. Based on the fact that Ramusio mentioned *only* Maserio

---

<sup>173</sup> Sanuto, V, col. 333: *In Colegio. Vene molti scolari zenthilomeni zoveni e altri, quali hanno piacer di doctrina, et sier Cabriel Moro per nome di tutti fè una oratione vulgar, exortando la Signoria vogli tuor a lezer qui domino Hironimo Masserio da Forli venuto di Hongaria, qual è doctissimo, et per 24 zorni ha fàto experimento di lezer.*

<sup>174</sup> A full account of the competition is in Sanuto, V, col. 438.

<sup>175</sup> Sanuto, V, col. 228: *mostrò gran cognition di scientie, fazile nel prononciar, et à optima doctrina.*

<sup>176</sup> *Opera M. Tullij Ciceronis, Partitiones oratoriae, Orator ad Brutum, Topica per Hieronymum Maserium castigata. Impressum Venetijs per Ioannem Baptistam de Sessa, 1505 die 24 mensis Augusti.*

<sup>177</sup> Duggan 1992, 145.

<sup>178</sup> Ross 1976, 564.

<sup>179</sup> Lepori 1980, 602.

among Fausto's teachers,<sup>180</sup> and said, *expressis verbis*, that Fausto studied Greek under Maserio, it follows that Fausto must have started his humanities education in 1506. This view is further corroborated by the evidence that, in 1506, the Senate decreed to open the School "both to young people who aspire to work for the Ducal Chancellery and to those who want to pursue liberal arts."<sup>181</sup>

For Fausto, the years of the apprenticeship under Maserio were very productive. Not only did Fausto made a living by copying for his teacher rare Greek texts but, more important, Maserio introduced Fausto to the selective circle of Venetian humanists. A few months before the departure of his teacher, Fausto published a Greek epigram in the edition of *Noctes Atticae* ("Attic Nights") by Aulus Gellius.<sup>182</sup> The edition was published by Giovanni de Tridino, nicknamed Tacuino, with whom Fausto published a Greek epigram in *Grammaticae Institutiones* by Urbano Bolzanio dalle Fosse in 1512.

The year of Maserio's departure opens quite a tumultuous period in the life of Fausto. During the war of the league of Cambrai, from 1509 to 1511, the School of Saint Mark remained closed and "the public lectures were suspended for three years, with great shame and loss for everybody."<sup>183</sup> Deprived of Maserio's protection and needing a job, Vettor Fausto found a new patron under Aulo Giano Parrasio (1470-1522), a scholar

---

<sup>180</sup> In addition, Fausto informed us that he had been also the pupil of the Cretan scholar Marco Musuro, who, however, taught at the School much later, from 1512 to 1516. See discussion below.

<sup>181</sup> Foffano 1892, 457.

<sup>182</sup> The title of the edition reads as follow: *Accipite studiosi omnes Aulii Gellii noctes micantissimas: in quibus vigilas et somnum pacatissime reponatis. Nihil enim in latinis obstrepet inconinnyum. In Graeci minus. Quippe quae nunquam antehac fuerint accuratius emendate. Hinc rerum et dictionum speciosarum indicem locupletissimus habetote. Et libri VIII. Quem desideramus capita quae antehac nunquam in lucem prodierunt. Laus Deo. Cum privilegio. Impressum Venetiis per Ioannem de Tridino alias Tacuinum. Anno domini MDIX die XX Aprilis.*

<sup>183</sup> ASVe, Senato Terra, reg. 17, fol. 117v.

from Calabria.<sup>184</sup> Parrasio's arrival in Venice is documented since at least 10 September 1510.<sup>185</sup> The events that occurred in Fausto's life between July 1509 and the end of 1510 are colored with gloomy tones, and culminated in an indecorous episode: the stealing by Parrasio of 90 texts (among which were printed books and 11 Greek manuscripts) that belonged to Fausto.

The episode is narrated by Fausto himself in a letter addressed to the Neapolitan humanist Jacopo Sannazaro (1457-1530).<sup>186</sup> The letter is undated, but Gualdo Rosa suggested that it was probably written in the first months of 1511.<sup>187</sup> The letter that Fausto wrote to Sannazaro is particularly interesting for our research because Fausto notes that he is a friend of Fra' Giovanni Giocondo from Verona (1433-1515), the celebrated architect who, in 1499/1500, was appointed royal architect by Louis XII, the king of France. Unfortunately, Fausto never got back the stolen manuscripts and books.

In 1511 Fausto published his first two important works: an edition of the six comedies by Terence printed by Lazzaro de Soardi in August 1511, and some philosophical works by Cicero, issued by the same printer in November 1511. From an in-depth study of this edition, it appears that Fausto made a living teaching Latin and Greek to a nobleman, the adolescent Andrea Trevisan.<sup>188</sup> The Terentian edition also comprises a short treatise that Fausto wrote, *De comoedia libellus*, focused on ancient

---

<sup>184</sup> Gualdo Rosa 2005, 25-36.

<sup>185</sup> Parrasio wrote a letter in Venice dated to 13 September 1510 addressed to his Calabrian pupil Giovanni Antonio Cesario.

<sup>186</sup> ONB, Ms. Vindobon. Lat. 9737e, fol. 11r-v. The letter has been published by Mauro (1961, 407-8 and 496-7).

<sup>187</sup> Gualdo Rosa 2005, 30.

<sup>188</sup> In the interest of brevity, the research undertaken on the Terentian edition is not included, but will be incorporated in a full-length forthcoming study. It should be noted that Concina (1990, 28) inadvertently identified Andrea Trevisan of the Terentian edition with the Senator Andrea Trevisan, son of Tommaso, who, at the time of the dedication, was certainly an old man and not an adolescent.

comedy.<sup>189</sup> Fausto dedicated both *De comoedia libellus* and the edition of the Terentian comedies to the young Andrea Trevisan.<sup>190</sup>

On 23 January 1511, the Senators decided to reopen the School of Saint Mark and appointed unanimously the great Cretan Marco Musuro to the lectureship of Greek with a salary of 150 ducats per month.<sup>191</sup> A disciple of the renowned Greek scholar Johannes Lascaris, Musuro taught at the University of Padua until its closing in 1509. Musuro taught Greek at the School of Saint Mark until 1516, after which date he moved to Rome at the invitation of Pope Leo X, who wanted to “restore the study of the Greek language and literature, which had almost disappeared and forgotten.”<sup>192</sup> In Venice, Musuro became one of the editors of the Aldine press and also a member of the New Academy. He spoke fluent Greek and translated letters sent by the Ottoman Sultan.<sup>193</sup>

Scholars believe Fausto further pursued his studies at the School of Saint Mark and became Musuro’s pupil.<sup>194</sup> This assumption is based on the fact that Fausto addressed Musuro as *meo praceptore* (“my tutor”).<sup>195</sup> However, the term *praeceptor* is not very common in the context of university or school tutelage. During the medieval

---

<sup>189</sup> *Hoc pugillari Terentius numeris concinatus, et L(ucius) Victoris Fausti de comoedia libellus nova recognitione, litterisque novis continetur. Hasce Terentii fabulas censura cujusdam sane eruditi viri, sumptibusque assiduis imprimendas Lazarus Soardus curavit. Venetijs MDXI humanae salutis Anno mense Augusti Augustum initium auspicatus.* Fausto’s *dedicatio* to Andrea Trevisan is on the fifth leaf of the book.

<sup>190</sup> Westerhoff (1726, lxxii-lxxviii) was the first to publish a Latin transcription of *De comoedia libellus*. It was later re-published by Lindenbrog (1820, 1: lx-lxxii) and Weinberg (1970, 1: 7-19). However, none of them provided the short dedication that opens the treatise.

<sup>191</sup> ASVe, Senato Terra, reg. 17, fol. 118r.

<sup>192</sup> Bembo 1538, 34 (letter 8): *Graecorum sermonem et Graecas disciplinas iam prope abolitas atque deperditas*. The letter of Pope Leon X that is addressed to Musuro is dated to 13 August 1513. In Rome, Musuro established a Greek academy on the model of those of Florence and Venice. Pope Leo X rewarded Musuro by electing him Archbishop of Malvasia in Morea in 1516 (ASVe, Senato mar, reg. 18, fol. 115r).

<sup>193</sup> Sanuto, XIV, col. 414 and 415.

<sup>194</sup> Concina 1990, 27; Piovan 1995, 399.

<sup>195</sup> Fausto 1551, *Oratio secunda*, fol. 18b and 35a.

Ages, the meaning had shifted from “the one who instructs,” to “the one who gives orders.”<sup>196</sup> Fausto probably worked for Musuro as a Greek copyist, as he had done so previously for Maserio. It is known that Fausto graduated with a doctoral degree, since Sanuto addressed him as *doctor*.<sup>197</sup> Although Piovan asserts that documents have as yet to confirm this information so far,<sup>198</sup> there is no reason to doubt the veracity of Sanuto’s words. Regardless, Fausto either studied or worked for Musuro only for a short period. In 1512, after Fausto published a Greek epigram in the Greek grammar written by Urbano Bolzanio and printed by Tridino, he left Venice and started “traveling all over the world.”<sup>199</sup>

### **From the *Homo Viator* to the *Homo Comprehensor*: The Quest for Knowledge (1512-1518)**

Paolo Ramusio stated that when Fausto, “having reached manhood (*ut adolevit*), and not content with being praised for his knowledge gained in Venice, he started traveling all around the world, not only to further the Greek language that was about to eclipse from the face of the earth, but also to provide himself with the wisdom (*prudentia*) and experience (*usus rerum*) that could only be gained by a protracted tenure abroad.”<sup>200</sup> From 1512 to 1518, Fausto was “eager to learn, not only did he travel all

---

<sup>196</sup> Teeuwen 2003, 109-110.

<sup>197</sup> Sanuto, XXVI, col. 127.

<sup>198</sup> Piovan 1995, 45: 399.

<sup>199</sup> Fausto 1511, *Dedicatio*, fol. 3a: *orbem terrarium peragraré*.

<sup>200</sup> Fausto 1551, *Dedicatio*, fol. 3a: *non contentus hac domesticatae disciplinae laude, orbem terrarium peragraré in animum induxit, ut non solum graecas litteras quasi toto orbe fugientes persequeretur, sed et prudentiam illam ac rerum usum compararet, qui non aliunde facilius quam ex longa peregrinatione proficiscitur.*



over Italy and visited scrupulously all the islands of the Mediterranean, but he also spent much time in Spain, France, and Germany. He became extremely knowledgeable and familiar with the customs of those people and with their cities, especially because he lived among them, and, as purported, he improved his knowledge of their cultures and of various disciplines.”<sup>201</sup>

The idea of the voyage for personal enrichment was rooted in the philosophical and theological inheritances of the Early and High Middle Ages, from Saint Augustine (354-430), to Ugo of San Vittore (1096-1141), and to poet Dante Alighieri (1265-1321). In the medieval mindset, *homo viator* was the Christian pilgrim who undertook pilgrimages and overseas expeditions to the Holy Land in their perpetual attraction to God. But, the geo-physical dimension of medieval traveling also implied an intrinsic metaphysical notion of the “voyage of the soul” (*peregrinatio animae*), in which the world was seen as a book (*liber mundi*) where it was possible to read the symbols and signs (*vestigia*) of the divine creation.<sup>202</sup>

During the Renaissance, with the emergence of rational thought (*ratio*) and the prevalence of “new scientific spirit,” the voyage became an *iter scientiae*, a “quest for knowledge” that involved a process of self-learning in which wisdom was the result of

---

<sup>201</sup> Fausto 1551, *Dedicatio*, fol. 3a: *discendi cupiditate, non omnem modo Italiam, atque omnes maris nostril insulas diligenter inspexit, sed Hispaniam quoque ac Gallias, et Germaniam, maiore ex parte peragravit: atque illarum gentium mores et urbes et in iis eruditissimum quenque cognovit, maximumque ex consuetudine convictumque hominum, ut optabat, rerum usum et multiplicis doctrinae augmentum adeptus est.*

<sup>202</sup> The Christian concept of *liber mundi* was first introduced by Saint John in his Gospel (1. 1-14): “In the beginning was the Word, and the Word was with God, and the Word was God [...] All things received being through him.” Saint Augustine was one of the first Christians to write about the subject (*Conf.* 13.15.16; *Ex. ad Ps.* 45.7), which was then promoted by several Christian authors of the Middle Ages. The symbolic interpretation of the world “written by the hand of God” (*scriptus a digito Dei*) was systematically expounded by Ugo of San Vittore (*De tribus diebus* 7.3), and permeated also the mentality of secular writers such as Dante Alighieri (*Divine Comedy*, Paradise XXX.85-90).

accumulated experience. Thus, human knowledge grounded in empirical observation of the sensory world was no longer “read” in theological terms, but it was interpreted through rational thought. “Philosophy” – the absolute pure knowledge – “is written in this grand book (I mean the universe), which stands continually open to our gaze, but it cannot be understood unless one first learns to comprehend the language and characters in which it is written. It is written in the language of mathematics, and its characters are triangles, circles, and other geometric figures, without which it is humanly impossible to understand a single word of it; without these, one would be wandering about in a dark labyrinth.”<sup>203</sup> The medieval *homo viator* became then the Renaissance *homo comprehensor*, the one “who attained a comprehensive knowledge.”<sup>204</sup>

During the Renaissance the ideal, cosmopolitan, and global education provided by the humanistic curriculum was to be reached not only by studying the ancient authors in the quiet of a library, but also by traveling. In the words of Ramusio, Fausto aimed to improve his knowledge of the Greek language by traveling in several countries of the Mediterranean, probably in search of manuscripts and ancient texts. The voyage, therefore, assumed a pedagogical role in the formation of *homo humanus*, who became then a *homo viator*, a traveler. Notably, the educational value of the voyage was

---

<sup>203</sup> Galilei 1898-1909, 4.232: *La filosofia è scritta in questo grandissimo libro che continuamente ci sta aperto innanzi agli occhi (io dico l'universo), ma non si può intendere se prima non s'impara a intender la lingua, e conoscere i caratteri, ne' quali è scritto. Egli è scritto in lingua matematica, e i caratteri son triangoli, cerchi, ed altre figure geometriche, senza i quali mezzi è impossibile a intenderne umanamente parola; senza questi è un aggirarsi vanamente per un oscuro labirinto.*

<sup>204</sup> During the Middle Ages, only Christ was considered at the same time *viator* (pilgrim) and *comprehensor* (beholder), according to the formula *Christus simul viator et comprehensor* of Saint Thomas Aquinas (*Summa Theologiae*, 3a, 15, 10). In these pages, I have purposely framed the phrase *homo comprehensor* in the historical context of the Renaissance to indicate that, in this period, the man replaced God at the center of the universe.

connected to the etymological sense of the Latin verb *educare*, the “leading out” of the individual into a progressive contact with social and cultural diversity.

Humanists advocated cosmopolitan education, which meant to exchange new ideas, to understand from multiple perspectives, to acquire experience that changes and rearranges the way of one’s thinking and one’s identity. Traveling aimed to provide cultural and moral improvement of an individual: humanists traveled to find new ancient texts to edit, or to visit new cities, and to become acquainted with other people’s customs. The voyages undertaken by Fausto encompassed not only cultural and moral dimensions – the intent to improve knowledge of Greek, and the desire to acquire wisdom and experience – but also a technological dimension, the *usus rerum*, “use of things” *strictu sensu*. The combination of cultural knowledge with the “practice” is a distinctive trait of Fausto’s entire life, and it presents a novelty in the formation of the ideal humanist. In this perspective of praising the quinquereme, Pietro Bembo (1470-1547) acknowledges:

...one can now also convince the uneducated that men of letters know how to do more than read or write, after Fausto [...] having never tried his hand at building galleys or ships or other types of vessels, has now been seen building the quinquereme as his first work, which was removed so far not only from current customs, but also from the memory of man, that no one could even have imagined how it should have been made to be able to sail. None of the galleys that have been built in our Arsenal are so well-designed, proportioned, and masterly constructed as his. The art [of shipbuilding] reached its highest specialization in our Arsenal, which is the prime place for it in the entire world. I say, therefore, that all men of letters must be greatly obliged to him, because they can no longer be told, as they used to be in the past, ‘Go and stay at your writing-desk with your letters,’ when

discussing matters other than books and inkpots, wherever they may be.<sup>205</sup>

In order to be effective, the educational voyage was usually undertaken at an early age and only when the young scholar was already sufficiently educated. The voyage completed the educational process. The humanist Francesco Petrarca, in a letter of 26 February 1347 and addressed to the Doge Andrea Dandolo (1306-1354), described the period of his voyaging as a youngster, “I must confess that during my early years of study, I followed the path of Homer, eager to learn about the customs of many peoples, to visit cities, and to contemplate new landscapes with curiosity.”<sup>206</sup>

Fausto was a young scholar at age 23 when he embarked on his voyages covering much of the Mediterranean. He had already attended the School of Saint Mark studying under Gerolamo Maserio, worked for a short period for Aulo Giano Parrasio, published few Greek epigrams, edited works of Cicero, and published a treatise on ancient comedy, *De comoedia libellus*. However, there is a second significant aspect that plays an important role in the theme of the voyage: the identification of the humanists with the “much- traveled” (πολύτροπος) Ulysses. It is not coincidental, therefore, that Petrarca

---

<sup>205</sup> Bembo, letter n. 975, addresses to Giovan Battista Ramusio (29 May 1529): *Si doverà pure ora potere a gl'ignoranti far credere che gli uomini letterati sanno ancor fare altro che leggere o scrivere, posia che il Fausto [...] mai avendo messo mano in gar galee o navi o maniera altra di legni, ora che egli vi s'è posto ha fatto per la prima sua opera la cinquereme, la quale era già sì fuori non solo della usanza, ama ancora della ricordanza de gli uomini, che nessuna era che pure imaginar sapesse come ella si dovesse fare, che ben si potesse reggere. Et àlla fatta di maniera che egli non fu mai più di gran lunga nel nostro arzanà fatta galea, né così bene intesa, né così bella forma ordinata, né così utilmente e maestrevolmente fabricata, come questa, ed è pure il nostro arzanà quello dove si lavora meglio di quest'arte che in altro luogo, che si sappia, del mondo tutto. Per la qual cosa dico che tutti i letterati huomini gli hanno ad avere un grande obbligo. Che non si potrà più dire a niun di loro, come per adietro si solea: Va, et statti nello scrittoio et nelle tue lettere, quando si ragionerà d'altro che di libri ed ti calamari, dove essi siano. In: Travi, 1992, 3:47.*

<sup>206</sup> Petrarca *Rerum familiarum libri*, 15.4. In: Bernardo 1982, 2: 258-61.

recalled “the path of Homer” and that Paolo Ramusio compared Fausto to the Homeric hero Ulysses (*Ulysses Homericus*).<sup>207</sup> Since ancient times, every traveler considered Ulysses the archetype of the man who sailed the sea of knowledge, who endured difficulties, and succeeded returning home. “Ulysses” – says the poet Horace – “the tamer of Troy, the man of vision who studied the cities and manners of many peoples, and who, as he struggled home leading his men across the tracts of the open sea, endured many a horror, yet never sank in the waves of adversity, has set before us a helpful example of what goodness and wisdom can do.”<sup>208</sup>

Besides the myth of Ulysses, the ancient Greek philosophers set the example of the quest for knowledge all over the explored world as holders of the absolute and pure knowledge of all ages, and ideal models to emulate. The passage of Cicero’s *De finibus* about Pythagoras, Plato, and Democritus, who “...were so eager of knowledge that they traveled to and over the remotest part of the world...”<sup>209</sup> is echoed by Fausto who writes, “Plato and many others [philosophers], in order to gain knowledge, traveled all over the world, thus undertaking great effort and many dangers.”<sup>210</sup> According to Fausto, the ideal, cosmopolitan humanist, “...not only should study much [...] but he should also

---

<sup>207</sup> Fausto 1551, *Dedicatio*, fol. 3b.

<sup>208</sup> Hor. *Ep.* 1.2.17-22: *Rursus, quid uirtus et quid sapientia possit, utile proposuit nobis exemplar Vlixen, qui domitor Troiae multorum prouidus urbes, et mores hominum inspexit, latumque per aequor, dum sibi, dum sociis reditum parat, aspera multa/pertulit, aduersis rerum inmersabilis undis.* For the reception of the myth of Ulysses from ancient to modern times, see: Vredeveld 2001, 846-82.

<sup>209</sup> Cic. *Fin.* 5.19: *Quid de Pythagora? quid de Platone aut de Democrito loquar? A quibus propter discendi cupiditatem videmus ultimas terras esse peragratas.*

<sup>210</sup> Fausto 1551, *Oratio quinta*, fol. 76a: *Platonem, atque alios item complures, qui ut aliquid discerent, magnos labores et multa pericula in peregrando terrarum orbe subierunt.*

see many things and acquire direct knowledge by traveling for a long period all the parts of the world.”<sup>211</sup> Without a multitude of experiences:

How could anyone, [...] who has never experienced country life, fully understand Hesiod and the *Georgics* by Vergil? How could anyone understand the navigation of Ulysses and Aeneas, or the long wandering of the Argonauts, if he only has seen ships hauled or anchored, and only the waves nearest to the shore? How could anyone, who has never set foot outside home and has been always woken up by the crowing of cocks and never by trumpet, who can not even imagine how terrible is the clamour of military camp and what strong feelings move the soul at the sight of the enemy in arms, how could he appreciate the extraordinary courage of Achilles or of any other hero? Then, could he in particular acknowledge, somehow, someone’s correct behavior, which is the virtue proper of poets, if he has never seen a king, except on a painting, or seen a court, except when it is empty? Could he appreciate a country of this world or the nature of a region [...] if he has never observed cities and costumes of other people, either during a journey or overseas voyages? [...] Therefore, we have to turn over innumerable pages, and we have to taste the water of different springs.<sup>212</sup>

---

<sup>211</sup> Fausto 1551, *Oratio secunda*, fol. 24a: *Non solum multa legerit necesse est [...] sed etiam multa viderit, atque in re praesenti cognoverit, bene magna terrarum orbis parte peragrata.*

<sup>212</sup> Fausto 1551, *Oratio secunda*, fols. 24b-25a: *Poterit ne aliquis [...] Hesiodi au Maronis georgica recte intelligere, qui ruri non sit diu multumque versatus? Poterit aliquis navigationem Ulyssis aut Aeneae, vel longos illos argonautarum errores animo capere, qui non nisi subductas aut stantes in anchoris naves et primos fluctus de littore sit conspicatus? Poterit ille, qui numquam domo pedem extulerit, quem semper galli cantus, nunquam buccina excitarit, qui ne suspicari quidem potest qualis sit horribilis ille fremitus castrorum, et quanto animi motum fortissimum quemque afficiat armati hostis conspectus, singularem illam Achillis, aut aliorum Heroum virtutem cogitatione metiri? Poterit denique ille, decorum gravis praesertim alicuius personae, quae praecipua virtus est poetarum, ullo pacto agnoscere, qui nullum regem nisi pictum, nulla curiam, nisi vacuam viderit? Aut orbis situm, regionum naturam [...] qui non multorum hominum urbes, atque etiam mores, tum internavigandum, tum in itinere faciundo perspexerit? [...] Oportet igitur innumerabiles propemodum pagina volverit, et multorum pariter fontium aquas gustarit.* The evocative image of the “innumerable pages” recalls the metaphor of the *liber mundi* and the Galilean “grand book of the universe.”

From 1512 to 1518, Vettor Fausto embarked on a six-year-long voyage that brought him, in succession, to Spain, France, Germany, and to Venetian *dominio da mar*, all places that Fausto described in his orations.<sup>213</sup>

Fausto's presence in Spain is revealed by the Greek epigram he published in the fifth tome of the six-volume Complutensian Polyglot Bible, which was printed in Alcalá de Henares (the old *Complutum*).<sup>214</sup> As indicated by the colophon, the fifth tome, containing the New Testament, it was printed on 10 January 1514, but the entire work was not actually finished until July 1517, and published in its entirety in 1520.<sup>215</sup> However, as Wilson noted, “[Vettor Fausto’s] collaboration in the Alcalá project [...] does not appear to have been the original purpose of his travel.”<sup>216</sup>

A discussion of the Polyglot Bible composition will help clarify certain aspects of Fausto's voyage to Spain, and also rectify some misconceptions that have been prevalent in recent bibliography. The Polyglot Bible was by far the most ambitious printing venture since the invention of the printing press in 1453.<sup>217</sup> The Polyglot Bible consisted of six volumes: the first four were devoted to the Old Testament, the fifth

---

<sup>213</sup> It should be noted that the maritime Republic of Venice was the departure port *par excellence* since the time of Marco Polo. Founded “...in the favorable position [...] at the extremity of the Adriatic gulf...,” Venice was “...the center of entire Europe, [...] all the overseas goods are easily imported here, either from the East and from the West; with regard to the Mediterranean, France is reachable in few days, and Germany in even less. Is there any island, either close to the coast or offshore, that is set apart and did not see a Venetian [man]?” Fausto 1551, *Oratio prima*, fols. 8a-b.

<sup>214</sup> The epigram, in Greek elegiac couplets, has been published by Legrand (1885, 1: 115). It is not, as Concina noted (1990, 30), the earliest Greek epigram composed by Fausto, since Fausto had previously published Greek epigrams in the “Attic Nights” (1509), in the edition of the Terentian comedies (1511), and in the “Institutions of Greek Grammar” by Urbanus Bolzanius (1512).

<sup>215</sup> On the Complutensian Polyglot Bible, see the study of Revilla Rico (1917), and Lyell (1917).

<sup>216</sup> Wilson 1988, 89.

<sup>217</sup> In 1501, the Venetian printer Aldo Manuzio conceived to publish a trilingual Bible (Hebrew for the original text, Greek for Septuagint, and Latin for the *Vulgata* by Saint Gerome) with the page layout on three columns. After Manuzio made a trial print (few lines from the *Genesis*), the project was aborted. The first chapter of the *Genesis* (1-14) has been published by Bigliuzzi (1994, document n. 54).

contained the New Testament, and the sixth volume comprised Hebrew, Aramaic, and Greek dictionaries and grammars, aids for pronunciation, a critical apparatus, and various footnotes. In 1502 Francisco Ximénez (Jiménez) de Cisneros (1436-1517), Cardinal and Great Inquisitor, promoted the project of the Polyglot Bible.<sup>218</sup> Inspired by the humanistic intellectual climate, in 1498 Francisco Ximénez established the *collegium trilingue* of Saint Ildefonso. This *gymnasium* of Latin, Greek, and Hebrew languages focused on theological studies and liberal arts (*theologica et liberalium artium studia*).<sup>219</sup> In 1508, Ximénez "...founded, on the model of the University of Paris, the *Academiae Cancellarium*, which was entitled to grant titles to students (called by the people degrees)."<sup>220</sup>

Within the institution of the school and the university, Ximénez conceived the idea of a Bible edition with the original texts in Hebrew, Greek, and Aramaic, and the Latin *Vulgata*. Such complex enterprise posed enormous technical problems. Not only did Ximénez need the original biblical texts, but also scholars who were expert in ancient languages and, most of all, special characters to print the Polyglot Bible.

---

<sup>218</sup> In 1492 Ximénez, when still a friar of the Franciscan order, was chosen as the confessor to the Queen Isabelle of Castile (1451-1504), thus playing a pivotal role on matters of the Church and State. Soon afterwards in 1495 he became the archbishop of Toledo and chancellor of the kingdom of Castile, gaining immense power and income. In 1507, at the age of 71, Ximénez was elected cardinal and Great Inquisitor. A detailed biography of Cardinal Francisco Ximénez de Cisneros is provided by Alvaro Gomez de Castro, *De rebus gestis a Francisco Ximeno, Cisnerio, archiepiscopo Toletano, libri octo. Compluti: Apud Andream de Angulo* (1569).

<sup>219</sup> Gomez de Castro 1569, 4, fol. 82b. Gomez, who had been a student of the *collegium*, said that Ximenes possessed self-taught Latin, Greek, and Hebrew during his youth. The *collegia trilingua* of Louven in Belgium (1518) and of Paris (1530) were modeled upon the school of Alcalá.

<sup>220</sup> Gomez de Castro 1569, 4, fol. 83v: [*Ximenius*] *constituit etiam, ad Parisiensis scholae exemplum, Academiae Cancellarium, qui honorum titulos, (quos vulgo gradus vocant) studiosis tribueret.* Gomez (1569, IV. 87a) explained that Ximenes "followed the example of Plato, who preferred the term *academia* to the term *lyceo* (sic)." The "Academy of the Chancellery" became later the Complutensian University of Madrid.



In 1502 Ximénez started constructioning a printing establishment close to the University for the production of the Polyglot. He called for the technical expertise of Anrao Guillé de Brocar (1460-1523). At that time, Guillé de Brocar was one of the few Spanish typographers to use Greek characters. For this reason, he received the laborious task of cutting new typefaces specifically designed for the Hebrew and Greek characters.<sup>221</sup>

For the original texts of the Old and New Testaments Pope Leo X provided Ximénez two very old manuscripts from the Vatican Library. From the Marciana Library of Venice, Ximénez obtained a rare codex from the collection of the cardinal Bessarion.<sup>222</sup> For amending the biblical texts, Ximénez hired excellent collaborators who were experts in Latin, Greek, and Hebrew languages.<sup>223</sup> The selected scholars were the same professors teaching at the *academia*, who were either friars or theologians. For the edition of the Latin text, Ximénez hired Antonio de Nebrija (1441/44-1522). Nebrija held the chair of Latin and was later succeeded by the Florentine Lorenzo Balbo de Lillo, editor of the “Argonauts” by Valerius Flaccus (1524). Ximénez also hired Francisco Vergara (1490-1545). Antonio Zimara de Córdoba (1460-1523) was in charge of the Hebrew texts. He was a converted Jew and expert of Aramaic and rabbinic studies. He was also one of the most prominent figures of Spanish Aristotelism, and translated several works of the Greek philosopher. Zimara coordinated the work of two

---

<sup>221</sup> Irigoin 1996, 65.

<sup>222</sup> A complete description of the manuscripts used for the composition of the Complutensian Polyglot Bible is in Revilla Rico 1917, 83-89.

<sup>223</sup> The section listing the names of the professors of the *academia* of Alcalá is based on Gomez de Castro 1569, 4, fols. 81v-82r.

other converted Jews: Paul Nuñez Coronel of Segovia (1480-1534) and Alfonso of Alcalá (fl. 1510).<sup>224</sup>

For the New Testament Greek texts, Ximénez brought together Juan de Vergara (1492-1557) – who translated into Latin Aristotle’s “Physics,” “On the Soul,” and part of the “Metaphysics” – Bartolomeo de Castro, and Demetrios Doukas from Crete (1480-1527). From 1506 to 1509 Doukas worked with Aldo Manuzio in Venice and edited the first volume of the *Rhetores graeci* (“Greek Rhetoricians”) and the *Moralia* by Plutarch (“Moral Works”).<sup>225</sup> Ximénez also hired Hernán Núñez de Guzmán *el Pinciano* (ca. 1470-1553) and Vettor Fausto, the youngest of the entire group.

The five names, those of Vergara, Castro, Doukas, Guzmán, and Fausto, appear at the beginning of the fifth volume devoted to the New Testament as authors of five different epigrams addressed to the cardinal Ximénez.<sup>226</sup> As Geanakoplos pointed out, the placing of Doukas’s epigram first suggests that “Doukas was not only the author of the preface, but primarily responsible for editing the Greek text of the New Testament volume.”<sup>227</sup> At the invitation of the cardinal, Doukas moved to Alcalá where he held the chair of Greek until 1519. It is not known exactly when Doukas arrived in Spain, but it must have been during the first months of 1511. His arrival coincides with the outbreak

---

<sup>224</sup> Actually, Coronel, Zimara, and Alfonso of Alcalá were very young and almost unknown when they joined the University. Their conversion to Christianity has to be connected with the edict expelling the Moors from Spain in 1492. The majority of Jews departed and those remaining had to convert to Christianity. Not coincidentally, Coronel, Zimara, and Alfonso of Alcalá converted just before the cardinal appointed them to the Hebrew and Aramaic chairs.

<sup>225</sup> On Dimitrios Doukas and his work in Venice, see Geanakoplos 1962, 223-55, and Layton 1994, 276-80.

<sup>226</sup> The two epigrams signed by Doukas and Fausto are written in Greek; the other three, signed by Juan de Vergara, Bartolomeo Castro, and Hernán Núñez, respectively, are written in Latin; see Lee 2005, 273.

<sup>227</sup> Geanakoplos 1962, 243. Doukas was the only native Greek among the five scholars.

of War of the League of Cambrai, when the Aldine press ceased its printing activities on May 1509.<sup>228</sup> Doukas taught Greek until 1519 when he left for Rome. In May 1519, Hernán Núñez who lived in Alcalá from 1513 to 1517, and was probably Doukas' assistant at the University, was newly appointed professor of Greek with the title *Comendador grieco*.<sup>229</sup>

When Doukas arrived in Spain, the text of the Old Testament had already been edited and the typographer Guillé de Brocar had cut the newly designed typefaces for the Hebrew and Greek texts. Doukas, however, accustomed to the high Venetian typographical standards and to Greek cursive characters employed by Manuzio using a different diacritical system, refused to print the text of the New Testament with the types created by Guillé de Brocar.<sup>230</sup> Doukas proposed that Ximénez print the text of the New Testament with different Greek typefaces, which displayed a new, simplified accentuation system. Doukas eventually succeed to win Ximénez's approval by arguing that the Greek typefaces had already been designed and cut, and therefore would not incur any further expense.<sup>231</sup>

In a brilliant and enlightening article, Jean Irigoín traces the origin of the Greek typefaces used by Doukas. Irigoín noted that the Greek characters displayed in the New

---

<sup>228</sup> Balsamo 2002, 181.

<sup>229</sup> Nader 1978, 481.

<sup>230</sup> Indeed, while the text of the Old Testament displays a regular system of breathings and accents, the New Testament shows a simplified system. The monosyllables have no accents, the tone syllables are marked only in the case of acute accents, and the grave and circumflex are omitted (Lee, 2005). In the preface of the New Testament, Doukas explained that "...the most ancient of the Greeks were accustomed to writing without these points..." and "...since [...] the whole New Testament [...] was written down in the Greek language from the beginning, just as it was imparted by the Holy Spirit, we too decided piously to preserve the archaic antiquity and majesty of the same language." The original Greek text was first published by Legrand 1885, 1: 115-17. The translation is by Lee, 2005 261-63.

<sup>231</sup> This is what Doukas asserted in the postface of the Greek grammar he published for his student at the University of Alcalá on 10 April, 1514. See Geanakoplos 1962, 234; Irigoín 1996, 68.

Testament of the Polyglot Bible are the same as those used by the Venetian editor Giovanni de Tridino (Tacuino) for his edition of the *Grammaticae institutiones* by Urbanus Bolzanio (1443-1524). The *Institutiones* were printed on 20 August 1512, but Giovanni Tridino had cut the typefaces as early as 1509.<sup>232</sup> Fausto had published a Greek epigram in the 1512 edition by Giovanni Tridino.<sup>233</sup> Irigoin suggested that Fausto's arrival in Spain and his successive involvement in the publication of the New Testament must be connected with Doukas's decision to use Tridino's Greek characters for the New Testament section of the Bible. Likely, Doukas asked the typographer Tridino to lend him the typefaces, and Fausto was requested, or offered, to bring them from Venice to Alcalá. This, then, appears to be the real reason of Fausto's voyage to Spain.

Recent bibliography discarded, or misinterpreted, what the significance of Fausto's role in the edition of the New Testament of the Complutensian Polyglot Bible.<sup>234</sup> In order to gauge Fausto's pivotal role in the New Testament, it is worthy to come back to the *Grammaticae institutiones* of Urbano Bolzanio printed in 1512 by Giovanni Tridino. This edition was a revised and improved version of the *Grammaticae institutiones linguae graece* ("Institutions of Greek Grammar") that Urbano Bolzanio had previously published in 1497 with Aldo Manuzio.<sup>235</sup> The 1512 edition was expanded

---

<sup>232</sup> Irigoin 1996, 69.

<sup>233</sup> *Urbani Bolzanii Grammaticae institutiones iterum perquam diligenter elaboratae [...] Impressum Venetiis: sumptu miraque diligentia Ioanis de Tridino alias Tacuino, 1512 die XX. Augusti.*

<sup>234</sup> Concina (1990, 30) omitted any discussion of the topic, and vaguely stated that "Fausto was involved in the preparation" of the New Testament. Likewise, Wilson (1988, 89), who cautiously notes, "It is sometimes alleged that he went to Spain with Demetrius Ducas in order to collaborate with him in the production of the Alcalá Polyglot Bible." Bataillon (1937, 1: 42) writes that "...probably Fausto was the typographer that arranged the text under the direction of Doukas," which is unlikely, since Ximénez hired Brocar for this complex task. On the other hand, Legrand (1885, 1: cv) stated that the Greek text of the New Testament was due "...to the joint effort of Demetrius Ducas and Niketas Faustos."

<sup>235</sup> Irigoin 1996, 69.

with new sections and improved with a new diacritical system. The diacritical system used in the 1512 Tridino edition could not have been the typographer's initiative, but rather the work of Urbano who possessed the capacity for such a task.

The fact, however, that Fausto published a Greek epigram in the edition leads one to believe that Fausto contributed to the metrical apparatus. Through the years, Fausto became a renowned metrical expert in Venice. In 1520, Fausto revised the metrics of the *Parakliti* (better known as Oktoikhos). This book contains hymns to the Virgin in the eight-tone cycle. In the preface of the *Parakliti*, Fausto asserted that he contributed to the edition as a metrical expert.<sup>236</sup> Although Fausto was not part of the initial group of Greek experts invited by Ximénez, and although he played a minor role compared to that of the other four scholars (Vergara, Castro, Doukas, Guzmán), it seems plausible that he revised the metrics of the New Testament. However, during his stay in Spain, Fausto built such a strong reputation as an esteemed scholar that Cardinal Ximénez offered him a position as a Greek teacher at the University, but Fausto declined.<sup>237</sup>

More difficult is determining when Fausto left Venice and sailed to Spain. Concina writes that “[Vettor Fausto]...after a voyage into the Mediterranean, returned to Venice and joined Giovanni Badoer, descendant of an important, ducal family, and Venetian ambassador, who departed from the harbor of the lagoon on board the galley *Cappella* on June 1512, and arrived in Valencia one month later.”<sup>238</sup> This hypothesis,

---

<sup>236</sup> Lee 2005, 274.

<sup>237</sup> Fausto 1551, *Oratio secunda*, fols. 36a-b.

<sup>238</sup> Concina 1990, 30: [Vettor Fausto...], *rientrato a Venezia, dopo un viaggio nel Mediterraneo, si fosse accompagnato a Giovanni Badoer discendente di una grande casa ducale e ambasciatore veneziano,*

although suggestive, needs reassessment. First, Giovanni Badoer (1465-1535) was elected ambassador to the Spanish court on 11 June 1512,<sup>239</sup> but he departed from Venice on 25 June for Civitavecchia.<sup>240</sup> From Civitavecchia, he sailed to Barcelona on 15 July 1512, arriving there on August 3<sup>rd</sup> of the same year.<sup>241</sup> Fausto – since he was in charge of bringing from Venice to Alcalá the Greek typefaces prepared for the Tridino edition of August 1512 – could not have left Venice prior to this date, as asserted by Concina. However, Fausto was a close friend of Giovanni Badoer. Their friendship must have begun in Spain, since Fausto dedicated his Latin translation of the Aristotelian “Mechanics” to Giovanni Badoer, and addressed him as “mindful of [our] companionship in Spain.”<sup>242</sup> It is not by coincidence that Fausto published the “Mechanics” in Paris in 1517. In 1516 Giovanni Badoer was sent to France as the ambassador for Venice, and Fausto accompanied him in this diplomatic mission to France.<sup>243</sup>

Most likely, Fausto left Spain in 1513, in concomitance with the arrival of Hernán Núñez in Alcalá, and Núñez became Doukas’ assistant at the University. In 1513

---

*partito dal porto lagunare con la galera Cappella nel giugno 1512 e giunto a Valenza un mese più tardi.* Giovanni Badoer (1465-1535) was a prominent Venetian politician. After his studies in Padua, he became resident ambassador in Spain (1498-1499; 1512-1524), Naples (1500-1501), Hungary (1501-1503), Rome (1507-1508), and France (1516-1517; 1520-1524), and a special envoy to Poland in 1502 and to Rome in 1534. He became Proveditor of Chioggia (1504-1506), Brescia (1518-1519), and Padua (1531-1532), and captain of Verona (1525-1526). He was a senator and member of the Council of Ten and of the Great Council.

<sup>239</sup> Sanuto, XIV, col. 316.

<sup>240</sup> Sanuto, XIV, col. 450. For the galley *Cappella*, see Sanuto, XIV, col. 324.

<sup>241</sup> Sanuto, XV, col. 32, and 168.

<sup>242</sup> BNM, 2983: *Aristotelis mechanica Victoris Fausti industria pristinum habitum restituta ac latinitate donata. In aedibus Iodoci Badii MDXVII.*

<sup>243</sup> Sanuto, XXVI, col. 52.

Núñez was appointed professor of Greek and assumed the lectureship that was first offered to Fausto.<sup>244</sup>

The year 1513 is a period of turbulence for Fausto. He experienced military life under the mercenary captain Baldassare Scipione, commander of a squadron of knights in the army of the Venetian general Bartolomeo d'Alviano (1455-1515).<sup>245</sup> During this time, Fausto became acquainted with Scipione, “a man interested in letters, who entertains correspondence [in Latin], and is knowledgeable in the military art [...] and in many other sciences.”<sup>246</sup> Fausto remained in the army until 1515, as he noted in the dedication of the Aristotelian “Mechanics.”<sup>247</sup>

As already mentioned, in 1516, Fausto was part of the Venetian envoy to France with the newly elected ambassador Giovanni Badoer. Fausto lived in France for about two years and he visited his friend, the architect Fra' Giocondo, and joined the circle of humanists in Paris. Given Fausto's acquaintance with France it was not by chance that at the death of François La Rouge, the French ambassador in Venice, Fausto was assigned to deliver publicly his funeral eulogy (corresponding to the fourth oration of the *Orationes*). In it “...he explained accurately the customs and the governmental

---

<sup>244</sup> Nader 1978, 481.

<sup>245</sup> Fausto 1517, *Dedicatio*, fol. 1a; Fausto 1551, *Dedicatio*, fol. 3b. Bartolomeo d'Alviano was captured by the French in 1509 after the defeat of Agnadello. He was released in 1513, the same year in which he came to service and placed in charge of the military affairs in the Venetian Terraferma, in particular in Friuli, Padua, and Brescia (Sanuto, IX, col. 241, 400, 537; X, col. 36, 37, 330, 362, 548, 578, 788; XX, col. 141, 485; XXI, col. 269, 345, 350).

<sup>246</sup> Fausto 1551, *Dedicatio*, fol. 3b: *non solum in litteris iucundus fuit, verum etiam et in scribendis epistolis, et in re militari tractanda [...] ut ex multiplici scientia.*

<sup>247</sup> Fausto 1517, *Dedicatio*, fol. 1a.

institutions of France, the splendor and the power of the king, and the administration of that kingdom.”<sup>248</sup>

François La Rouge (also Lerouge, Rubeus, di Rossi, di Rugie) was a doctor of law from Tréguier in Brittany, and belonged to the milieu of French scholars and poets. On 16 April 1518, La Rouge was elected senator in the newly formed Parliament of Paris, becoming one of the king’s *maîtres ordinaires des requêtes*. In 1519 he was chosen to replace Jean de Pins as French ambassador to Venice, and arrived in the Serene Republic on 19 April 1520.<sup>249</sup> He occupied the position until his death on the night of 15 October 1521.<sup>250</sup>

### **Teaching Greek at the School of Saint Mark (1518-1546)**

“Nothing is as pleasant and sweet as the city where one is born. Nothing pleases more than what is missing, especially if it is desired with anxiety.”<sup>251</sup> Fausto, desirous to put his new learning at the service of the Republic, returned to Venice in 1518.<sup>252</sup>

“Senators, I return to you in this city,” wrote Fausto in his first oration, “...not unskilled, nor ignorant, but knowledgeable and an expert.”<sup>253</sup> In this oration, Fausto expresses all his nostalgia for Venice, which appeared to his longing eyes greater and bigger, “I am now approaching this city founded in the middle of water, whose magnificent harbor

---

<sup>248</sup> Fausto 1551, *Dedicatio*, fol. 3a-b: *accurate Galliae mores et instituta, regis cultum ac potentiam, et totius regni administrationem explicat.*

<sup>249</sup> Sanuto, XXXVIII, col. 430.

<sup>250</sup> Sanuto, XXXII, col. 37 and 38.

<sup>251</sup> Fausto 1551 *Oratio prima*, fol. 2b: *Nihil est natali solo iucundus, nihil suavius, nihil cuius praesentia magis delectemur quodque ubi amisimus, maiori cum auxietate quaeremus*

<sup>252</sup> ASVe, Consiglio di Dieci, Parti secrete, reg. 1, folios not numbered.

<sup>253</sup> Fausto 1551, *Oratio prima*, fol. 10a: *Vos autem, eadem ipsa non inscio, non ignaro, sed conscio et experto.*



[...] can accommodate at once 1,000 Greek ships that once were captained by Agamemnon, and the fleet of King Heron and Philadelphus.”<sup>254</sup>

Fausto’s return to Venice must be connected with the death of the celebrated Greek scholar and professor Marco Musuro, which occurred in Rome the same year. Actually, vacancy for the Greek lectureship at the School began in 1516 when Musuro left Venice for Rome at the invitation of Pope Leo X to help him establish the “Roman Academy,” modeled upon the Aldine Academy. Musuro’s departure was meant to be temporary, but his stay in Rome lasted longer than expected and he eventually passed away. Therefore, on 29 June 1518, the Senate decided to open the vacant lectureship to competition, “...since the chair of Greek has been empty for several months, Greek lectureship was without a teacher in our city [...] due to the death of our lecturer [Marco Musuro], [...] it is not convenient to leave this position vacant.” The Venetian senators decreed “...to appoint a new lecturer to replace the said Marco Musuro, with a salary of 100 ducats in accordance with the previous condition terms [...] all candidates for the lectureship in Greek have to register their names with the Chancellery within two months. The candidates are required to deliver a public lecture in the Greek language, after which, there will be an election.”<sup>255</sup>

---

<sup>254</sup> Fausto 1551, *Oratio prima*, fol. 11a: *Venio nunc ad urbem his mediis aquis fundatam quae, si nihil aliud,, certe quod ea magnitudine portum habet, ut non millae Graecorum naves, quibus olim praefuit Agamemnon, aut classem regum Hieronis et Philadephi [...] capere queat.*

<sup>255</sup> ASVe, Senato terra, reg. 20, fol. 132v: *Molti mesi è’ vacata la lettura greca in questa nostra città [...] per la morte del dicto lector, non è da lassar più questo loco vacuo [...] che secundo el consueto per ballotacione de questo consiglio, eleger se deba uno lector in loco del predicto Reverendo Marco Musuro, cum salario, cum salario de ducati cento alanno, modi, et condition consuete, et sia publice proclamato che qualunque pretenderà essere provato alla lectura predicta deba fra termine de duo mesi haversi dato in nota alla cancellaria nostra et avanti la ballotacione deba cadauno de quelli che se metterano alla prova leçer publicamente una lection greca.* The same decree is reported by Sanuto (XXVI, col. 502-503).

The Greek lectureship at the School of Saint Mark was an extremely prestigious position and probably the highest appointment any humanist could have aspired to achieve at that time in Venice.<sup>256</sup> The chair of “humanities” or Latin letters at the School was also very highly esteemed, but it was not considered to be as formative in the education of the future ruling class.<sup>257</sup>

On 4 October 1518, Fausto, who was considered *bon Greco*, an expert in Greek, performed in the auditorium of Saint Mark in Terranova. He delivered an oration from *De laudibus patriae* (“Praise of the Native Land”) by the Greek rhetorician Lucian (C.E. 125-180).<sup>258</sup> It was not by chance that Fausto chose to perform Lucian’s oration on the praise of the native land, for it would have sounded as if it were a praise of Venice itself. Moreover, the fact that Fausto returned to his native city after many years of traveling surely must have conferred to the public lecture great appeal and autobiographical color.

On 8 October Fausto was requested by the senators to deliver a second public lecture, for which Fausto was greatly praised:

In this day, in the auditorium, Vettor Fausto continued his demonstration in Greek, giving an oration in which he displayed a vast memory and knowledge of the sciences. He performed *De Argonautis* by Orpheus.<sup>259</sup> At the lecture, there was the ambassador from France, the ambassador from Ferrara, the procurator Alvise da Molin, three councilors, *sier* Luca Trun,

---

See also another passage from Sanuto (XXV, col. 120), who reported the previous decree that established the salary at 150 ducats and the registration period within only eight days.

<sup>256</sup> Ross 1976, 543.

<sup>257</sup> De Vivo 2007, 64.

<sup>258</sup> Sanuto, XXVI, col. 52.

<sup>259</sup> *De Argonautis* by Orpheus that Fausto performed is in all probability the Greek poem titled *Argonautica* by Apollonius Rhodius (early third century B.C.E.), rather than the Latin poem *Argonautica* by Valerius Flaccus, since it is explicitly said that Fausto delivered a Greek oration. Humanists wrongly attributed the *Argonautica* by Apollonius Rhodius to the mythical hero Orpheus.

*sier* Francesco Bragadin, and *sier* Antonio da Mula, two Sages of the Council, the doctor and knight *sier* Zorzi Pisani, and the knight *sier* Francesco Donado. Moreover, there were all these doctors: *sier* Sebastian Foscarini professor of philosophy, *sier* Andrea Mocenigo, *sier* Hironimo da Ca' Tajapietra, *sier* Marco Antonio Venier, *sier* Nicolò Tiepolo, *sier* Zuan Baxadona, *sier* Hironimo Polani, *sier* Lorenzo Venier, *sier* Nicolò da Ponte, and many other noblemen, among which were I, Marin Sanudo, and many other senators. There was also Raphael Regio, the public lecturer at the chair of humanities, and many other people who enjoy the sciences. [Vettor Fausto] carried himself extremely well, concluding that he should be given the chair by virtue of his merits. He is young, and he has done nothing but study, and he wishes to be given this test: let him be given a subject in Latin or Greek, verse or prose, to develop, and let the same be given to anyone else who so wishes. If what he does is not more learned, let him not be given the chair.<sup>260</sup>

Fausto's request for appointment to the chair shows that he was most confident with his knowledge of both the Greek and Latin languages, but it also demonstrates his audacity and his capacity to take risks, especially since the other candidates were highly renowned scholars. Among them, were Costantino Paleocapa, a Greek monk from Crete who had worked as a copyist of Greek manuscripts, and Giovanni Ettore Maria Lascaris, whose humanistic pseudonym was *Pirgoteles*.<sup>261</sup> Giovan Battista Egnazio (1478-1553) was also among the candidates for the public competition. On 7 October 1518, Egnazio

---

<sup>260</sup> Sanuto, XXVI, col. 107 and 108: *In questo zorno, in l'auditorio, Vettor Fausto fece un principio a lezer in Greco, et fece una oration: monstra gran memoria et cognition di scientie. Lexe Orpheo de Argonautis. Vi fu l'orator di Franza et quel di Ferrara, sier Alvixe da Molin procurator, tre consieri, sier Luca Trun, sier Francesco Bragadin e sier antonio da Mula, do savii dil Consejo, sier Zorzi Pixani dottor, cavalier, sier Francesco Donado el cavalier, e tutti questi doctori: sier Sbastian Foscarini leze philosophia, sier Andrea Mozenigo, sier Hieronimo da chà Tajapietra, sier Marco Antonio Venier, sier Nicolò Tiepolo, sier Zuan Baxadona, sier Hironimo Polani, sier Lorenzo Venier, sier Nicolò d aPonte, et altri patricii, tra i qual io marin Sanudo, e molti di Pregadi. Vi fu domino Raphael Regio lector publico in humanità, et assa' altri che hanno piacer de scientia. Et si portò benissimo, concludendo, per meriti se sia da dar questa lectura. È zovene, ma non ha fato altro che studiar, e vol far questa experientia li sia dato latin o greco, versi o prosa da far, et sia dato questo istesso tema a chi si voglia; si quello farà lui non sarà più docto, non li sia dà dicta lectura.*

<sup>261</sup> Sanuto, XXVI, col. 127. Giovanni Ettore Maria Lascaris, called the *Pirgoteles*, has not to be confused with the sculptor Giovanni Giorgio Lascaris (1496-1531), also known as the *Pirgoteles*. Giovanni Giorgio Lascaris died of the plague in 1528, at the age of 29.

delivered the oration “Against Midia” by Demosthenes,<sup>262</sup> and on 9 October, Egnazio continued to lecture in Greek in Terranova.<sup>263</sup> A week later, on 16 October, “Battista Egnazio came before the College announcing that he longer wanted to participate in the competition, and that he would teach Greek whenever the Signory asked him, and without any reward. He also said that the intrigues (*archimie*) of the other [candidates] would soon be revealed.”<sup>264</sup> On the very same day, the senators appointed “*dominus* Vettor Fausto, doctor and a Venetian citizen by birth, an expert in both the Greek and Latin language.”<sup>265</sup>

The intrigue Egnazio referred to should probably be identified with the political connections that Fausto built over the years. Among those present at the lecture Fausto delivered on 8 October were influential political personages. There was the French ambassador Jean de Pins, who had learned Greek in Italy and had met Fausto in Paris. Also present was Giovan Giacomo Leopardi, Count of Montelabate, who was orator in Venice for the Duke of Urbino and a close friend of Fausto through their common interest in military architecture. Additionally, there were members of the Venetian nobility, politicians and senators, and many scholars. As in the case of the election of Gerolamo Maserio in 1503 to the chair of humanities, the appointment was decided by the favor of the Venetian noblemen, who had attended the School.

---

<sup>262</sup> Sanuto, XXVI, col. 108.

<sup>263</sup> Sanuto, XXVI, col. 110.

<sup>264</sup> Sanuto, XXVI, col. 122: *Vene in Colegio pre' Batista Egnatio a dir non vol esser balotato a la lectura greca, et lezerà quando vorà la Signoria senza alcun premio, e continuando si conoscerà le archimie de' altri.*

<sup>265</sup> ASVe, Senato terra, reg. 20, fol. 159v: *Dominus Victor Faustus doctor civis venetus originarius grecae et latinae linguae peritus.* I shall point out that Ferreiro (2009, 7) confused the School of San Marco, which was the School of the Chancellery, with the Scuola Grande of San Marco, which was one of the six major sodalities in Venice.

In April 1519 Fausto wrote an oration – later included by Paolo Ramusio in the *Orationes quinque* – “...in order to thank [the Signory] for receiving the honor of the appointment at the Greek lectureship.”<sup>266</sup> The oration was the occasion to deliver a praise of Venice. Fausto modeled it upon the well-established topos of the “myth of Venice” which had flourished since the 13<sup>th</sup> century and formally theorized in the 15<sup>th</sup> and 16<sup>th</sup> century.<sup>267</sup> Venetian propagandistic historiography and iconography from the fifteenth and 16<sup>th</sup> century shaped the image of Venice as *altera Roma*, or “second Rome,” and as *alterum Byzantium*, or “second Byzantium.”<sup>268</sup>

The appointment to the Greek lectureship was a great achievement for Fausto. He stated that “teaching Greek is wonderful, but teaching Greek in Venice, with such high knowledge and nobility, is even more wonderful.”<sup>269</sup> For Fausto, it must surely have seemed as a personal recognition of all his efforts to master Greek, “...the letters studied during many nights working by lamp-light.”<sup>270</sup> Fausto believed the lectureship of Greek had a prominent role in the education of Venetian youth. He compared the *magister*, the teacher, to the *remigis*, the helmsman of a ship:

---

<sup>266</sup> This is the first oration published by Ramusio. The complete title is: *Oratio prima, qua gratiae aguntur pro impetrato graece profitendi honore.*

<sup>267</sup> Modern historiography refers to the so-called “myth of Venice” to indicate the Serenissima’s supposed perfection in possessing an exemplary political constitution and civic harmony that created a distinctive historical identity and set Venice apart from the other Italian Republics. The literature on this topic is extensive, but the following works are particularly significant: Fasoli 1958, 1: 445-79; Gaeta 1961, 58-75; Grubb 1986, 43-94; Queller 1986, 17-28; Finley 1999, 294-328.

<sup>268</sup> For the *altera Roma*, see: Pertusi 1970, 269-332; Marx 1978, 126; Tafuri 1989, 15; Pincus 1992, 101-14. The definition of Venice as *altera Byzantium* is by the Cardinal Bessarion, who thus referred to the Republic in a letter dated to July 1468 to the Doge Foscari. See: Geanakoplos 1962, 116.

<sup>269</sup> Fausto 1551, *Oratio prima*, fol. 16b: *Perpulchrumque est litteras publice docere; sed Venetiis, in tanta frequentia, tantaque nobilitate, pulcherrimum.*

<sup>270</sup> Fausto 1551, *Oratio prima*, fol. 12a: *Litterae tot lucubratibus noctibus acquisitae.*

Who could ever deny that the teacher is like the helmsman who is in charge of controlling a ship? [The helmsman], only after he has retracted the steering oar onto the boat, can sleep peacefully and safely. Often he runs from the highest point of the stern up to the bow, sometimes exhorting the sailors, while reprimanding others; he exerts so much effort that he wears himself out at times; at night, he gazes at the sky, and observes the winds and the weather; he is so experienced that he can predict dangerous circumstances. So, if the honor is great, also the effort that is required is great.<sup>271</sup>

During the years at the School of Saint Mark, Fausto modeled his classes on the educational method of Varro and Quintilian. He taught Greek language by explaining in Latin.<sup>272</sup> However, “...some men, who are driven by envy and ill-will...”<sup>273</sup> derided Fausto. They said his lectures were poorly attended, that he was absent for extended periods, and that he was always sick.<sup>274</sup> Fausto wrote a second oration for the Signory in November 1520 in order to secure a salary raise (which he was not able to obtain), which was a systematic apology in his defense against the charges of neglecting his duties. In all likelihood, the accusers were scholars competing for the same position, and also members of the nobility who had not supported Fausto’s candidacy. However, Fausto had already begun to work on the quinquereme, at least at a theoretical level, and this

---

<sup>271</sup> Fausto 1551, *Oratio prima*, fol. 15a: *Quis neget in navi praestare, magistrum, esse quam remigem? Sed ille brevi temporis spatio remum trahit, deinde dormit ociosus atque securus. Hic vero interdiu e summa puppi ad proram usque discurrit, et nautas modo hortatur, modo castigat, tanta contentione, ut latera quandoque deficiant. Noctu coelum contemplatur, ventos ac tempestates observat. Natura enim comparatum est, ut omnia contrariis aequae pensetur. Si igitur summus est honor, summos etiam labores afferat necesset est.*

<sup>272</sup> Fausto 1551, *Oratio secunda*, fols. 20b-22a.

<sup>273</sup> Fausto 1551, *Oratio secunda*, fol. 20a: *Certi homines malignitate ac invidia ducti.*

<sup>274</sup> In the second oration written by Fausto and dated to November 1520, Fausto is accused of several charges, such as leaving the lectureship vacant due to sickness, and that his lectures were not well-attended and little appreciated. Curiously, Fausto replies to the “ridiculous and false charge” (*ridicuum et falsum crimen*) with a long and passionate defense of mathematical science, which suggests the real reason for his accusations. One could conjecture that, since 1520, Fausto had been focusing his studies on naval architecture. For Fausto’s apology and his charges, see Fausto 1551, *Oratio secunda*, fol. 20a, 23a-b, 27b, and in particular fols. 31a-36b.

would justify his prolonged absences. Fausto taught Greek at the School of Saint Mark until his death in 1546.<sup>275</sup> In 1530, Fausto was also appointed librarian of the Library in Saint Mark, the modern Marciana Library, which housed the valuable collection of the Cardinal Basilios Bessarion.<sup>276</sup>

### **The Proposal of Building the Quinquereme (1525)**

On the afternoon of 15 August 1525, Fausto was admitted to the Ducal Palace for an audience with the Doge Andrea Gritti. Fausto proposed to the Venetian Republic constructing a quinquereme, or a galleass, that he himself designed. Unfortunately, none of Fausto's drawings have survived, and the only recorded reference to this is in *I Diarii* by the Venetian historian Marin Sanuto. Sanuto narrated the circumstances of the event as follows: "Vetor Fausto, who is lecturing in Greek in this city, came to the Doge, and showed a wonderful model for building a galley that was rowed with five oars per bench, while the light galley is rowed with only three [oars], and he showed the rowing system. Thus, the decision was entrusted to the College."<sup>277</sup>

For the maritime history of Venice, Fausto represents uniqueness, as he was the first and the only humanist in Venice who was interested in naval architecture and who proposed to the Republic a project for building a special ship. Despite the fact that Fausto could rely on support and protection of influential politicians, his proposal did

---

<sup>275</sup> ASVe, Collegio, Notatorio, reg. 26, fol. 51r.

<sup>276</sup> ASVe, Consiglio di Dieci, Parti comuni, reg. 5, fols. 39v-40r. On Bessarion's Greek manuscripts, see Zorzi 2002, 93-121.

<sup>277</sup> Sanuto, XXXIX, col. 322: *Vene dal Serenissimo Vetor Fausto leze in greco in questa terra, e monstrò uno bellissimo modello di far una galia qual vogerà 5 remi per bano, che le sotil vuoga solum 3, et qui monstrò il modo; sichè lo rimesse ad aldirlo in Collegio.*

not receive immediate acceptance; the Senators discussed Fausto's proposal for nearly a year.

On 17 September 1525, the Senators and the Doge held a meeting to discuss Fausto's proposal.<sup>278</sup> However, the Venetian senators invited to the meeting the Patrons of the Arsenal and the master shipbuilders of the galleys who were encouraged to participate in the discussion regarding the technical aspects of the quinquereme. Sanuto wrote that "...the Doge and the Senators met in the saloon of the College where proposals are presented with the participation of the Sages, and they evaluated the model of the five-oared galley designed by Vetor Fausto, who lectures in Greek in this city, at Terranova, with public salary. There were also Lunardo Emo, Superintendent of the Arsenal, and Antonio da Pexaro, Patron [of the Arsenal], since the others were not in Venice; [there were also] Lunardo and Mathio Brexan, and other master shipbuilders of the galleys in the Arsenal, and they discussed for a long time...[Lunardo] Brexan praised [the model], whilst [Mathio] Brexan condemned it."<sup>279</sup>

The debate about the technical aspects of the quinquereme, and especially on the rowing system, was highly pitched. The Senate was inclined to believe the opinion of Lunardo Brexan (1498-1540), a skilled shipwright. Toward the end of the 15<sup>th</sup> century he had built heavy *barze* of 1,200 tons, the first great round ships that sailed from the

---

<sup>278</sup> Sanuto, XXXIX, col. 440. The correct date is 17 September 1525, and not 7 September, as reported in Concina 1990, 67, n. 16.

<sup>279</sup> Sanuto, XXXIX, col. 440: [...] *il Serenissimo con la Signoria si ridusse in Collegio in sala dove s fa il Pregadi con i Savii, et veteno il modello di la galia di 5 remi fatto per Vetor fausto, leze in greco in questa terra in Terranova a salario pubblivo. Era etiam sier Lunardo Emo proveditor a l'Arsenal e sier Antonio da Pexaro patron, perchè li altri è andati fuora; Lunardo e Mathio Brexan e altri prothi di galie di l'Arsenal, e quì fo parlato assai...Brexan laudava et...Brexan biasemava.*



Venetian Arsenal for military purposes.<sup>280</sup> However, on 23 September 1525, a few days after the meeting with the naval architecture experts of the Arsenal, the Senate deliberated a proposal in favor of Fausto's project of building a quinquereme:

Our faithful Venetian *dominus* Vettor Fausto has been here, in our presence, and he had presented a model of a quinquereme, which is rowed by five oars per bench, and it has been examined and discussed by our master shipbuilders from the Arsenal. It would be beneficial to have in our Arsenal a ship for the safety of our overseas dominions, such as that of the quinquereme, and [it would be beneficial] also to hire the above mentioned *dominus* Vettor for our service. On the authority of this Council, it is proposed that the Superintends and the Patrons of the Arsenal provide [Fausto] with a ship-shed in which to build the above mentioned quinquereme, and with all the necessities in order to accomplish it. Furthermore, [it is proposed] that our ambassador in Rome ask the Blessed Pope to satisfy our request of 500 ducats of income for the above mentioned *dominus* Vettor as a favor from the Knights of Rhodes, since he had no such income. Moreover, in the event that this request is accepted, the above mentioned Vettor Fausto is bound to produce the rowing system of the quinquereme and to demonstrate it to the Superintends and Patrons of the Arsenal, and to the master shipbuilders. Once the quinquereme is approved by our experts, [Fausto] can start building his quinquereme and complete it. Furthermore, it is proposed that, while *dominus* Vettor is waiting for the above mentioned benefit, he will have for his sustenance the yearly amount of 100 ducats, which will be no longer given upon receiving the above mentioned income. These provisions will be effective from the day in which the above mentioned quinquereme is completed, fully armed, and shown that the rowing system works, upon which it will be praised and approved. Finally, *dominus* Vettor will be allowed to carry arms and to hire a guard for his safety and protection, as he has rightly requested.<sup>281</sup>

---

<sup>280</sup> Lane 1992, 50.

<sup>281</sup> ASVe, Consiglio di Dieci, Parti segrete, reg. 1, fol. 31r. See: APPENDIX I, doc. 1.

The Senate voted twice on this deliberation. Of the 25 Senators present at the Council, 16 voted in favor (*de parte*), eight voted against Fausto's proposal (*de non*), and one voted *non sinceri*, literally "not sincere," meaning that the Senator was not able to make an educated vote, or abstained. Unfortunately, the deliberation failed since Venetian legislation required a senatorial decree to secure three quarters of the votes in order to be approved. Basically, the majority of the Senators favored Fausto, but the decree did not pass for being one vote short.

On 17 January 1526, the Senators invited Fausto to speak a second time. Sanuto recorded that Fausto talked for a long time praising his quinquereme. He claimed that it would have been "the mistress of the seas" for its seaworthiness and for the great advantage and prestige that the Republic would have gained from its construction.<sup>282</sup> But among the senators, skepticism and dubiousness that a man of letters could have succeeded in building a ship had been spread by the incredulous shipwrights.

The master shipbuilders' main concern was the *alla sensile* rowing system of the quinquereme. It consisted of five rowers per bench, each with an oar. From the end of the 13<sup>th</sup> century to the middle of the 16<sup>th</sup> century the standard Venetian galleys were triremes (light galleys), developed from the Byzantine bireme in 1290.<sup>283</sup> The triremes were single-decked ships with 25 or 30 benches on either side and three rowers per bench, each pulling a separate oar.<sup>284</sup> The benches (or thwarts) were arranged obliquely to form an acute angle with the bulwarks, so that the inboard extremity of each oar was

---

<sup>282</sup> Sanuto, XL, col. 123.

<sup>283</sup> Sanuto the Elder (from Torcello) 1411, 57.

<sup>284</sup> Jal 1848, 749 and 752; Fincati 1881, 22.

positioned forward toward the bow than the outboard blade. Thus, the three oars, each pulled by a rower on the same bench, did not interfere with one another. Baldissera Quintio Drachio, in his *Vision* (1594), referred to a light galley with 24 benches, each arranged obliquely (*sbiasso*) towards the bow by 28 *dita*, that is to say 60.85 cm.<sup>285</sup>

Cristoforo da Canal, in his *Della militia marittima*, notes that “[...] the *pianero* is longer than the other two [oars], and it is 32 *piedi* long and pulled by the rower who sits closest to the gangway; the second oar is the *posticcio*, it is 30 ½ *piedi* long, and pulled by the rower who sits in the middle of the bench; the third oar, which we call *terzicchio*, or named *terzarolo* by Westerners, and the rower who pulls it is called by the same name, is 29 ½ *piedi* long. All three oars are arranged in order and run outboard parallel to one another, and they are slightly different in length.”<sup>286</sup> Thus, the *pianero* was 11.12 m long; the *posticcio* 10.60 m long, and the *terzicchio* 10.25 m long.

According to the historian Marin Sanuto the Elder of Torcello (1260-1343), the Venetian galley, or trireme, evolved from a one-decked bireme.<sup>287</sup> Sanuto recorded that

---

<sup>285</sup> Baldissera Quintio Drachio, *Visione*, in ASVe, Archivio Proprio Contarini, env. 2. The description and the construction rules (*ragioni fabbricatorie*) of the light galleys are on fols. 5v-13v. The mention of the benches is on folio 11r. The manuscript has been transcribed and translated by Theodore Lehmann (1992).

<sup>286</sup> Cristoforo da Canal, *Della militia marittima*, book 1: [...] *il pianero, maggiore degli altri due, cioè di lunghezza di piedi trentadue, et è quello che vuoga il galeotto che siede a canto alla corsia, il secondo chiamato il posticcio di lunghezza di trenta e mezzo, et è vogato da quel galeotto che siede per ordine secondo al banco, et il terzo, che noi terzicchio et i ponentini terzarolo chiamano, et così è detto parimenti il galeotto che lo tira, di lunghezza di piedi ventinove e mezzo, i quali tutti e tre sono anco dalla parte di fuori con giusto ordine assettati et si veggono apparire secondo le loro lunghezze l'uno alquanto più lungo dell'altro*. In: Nani Mocenigo 1930, 79. *Della Milizia marittima* is a dialogue among Vincenzo Capello, Alessandro Contarini (Venetian sea captains and experts on naval affairs), and Marc'Antonio Corner, and Giacomo Canale, two important politicians. The above citation is by Capello. The date of this manuscript has been variously reported. Nani Mocenigo (1930) dated it to 1540, Tenenti (1962) suggested 1553/54 and is more likely correct, Zeno (1662) proposed an earlier date, 1538. See Hale 1980, 3: 281.

<sup>287</sup> Concina (1990, 53) asserts without documentations that the Venetian galley evolved from the Byzantine bireme, that is to say, the dromon. Presumably Concina is citing Sanuto the Elder discussed below. It should be pointed out, however, that the Byzantine dromon was a two-level ship and that the

In 1290, almost all the galleys that sailed over the sea, were rowed by two rowers per bench: but after some ingenious men experimented that three oarsmen could have rowed on each of the above mentioned [bench], now almost all the galleys are rowed by this system. For this reason, no one should believe that it would be [too] heavy to add a fourth oar or even a fifth oar on a single bench of a galley, regardless of the size of the galley, after it has been proved [that the rowing system works]. Indeed, it is mentioned in some literary sources that, in ancient times, the Romans had three rowers pulling [each oar]. Vegetius, in his *De re militari*, where he talks about naval warfare, said that, in ancient times, some ships, which he called *liburnae*, had a single level of rowers; those ships that were slightly bigger had two levels of oars; some others, which were accordingly designed, had three, or four, or even five levels of oars.<sup>288</sup>

Although ancient texts on naval warfare such as *De re militari* by the Late Roman writer Vegetius mention multi-leveled ships, during the Renaissance the oars of the Mediterranean warship were arranged on a single level. In Venice, both the light galley and the great galley were single-leveled ships. Neither latter nor the former were rowed by more than three oars per bench. Thus, the project proposed by Vettor Fausto of building a quinquereme rowed by five rowers on a single bench, each pulling a separate oar, must have appeared revolutionary, if not visionary. For this reason, the Senators left

---

Venetian galley is a single level vessel, with its oars running on an outrigger beam (*correnti*) unlike the dromon, which did not have an outrigger. Pryor (2006, 423) asserts that the galley evolved from the monoreme dromon. See also Pryor 1995, 101-16.

<sup>288</sup> Sanuto Torsello 1411, V.33-44: *In MCCXC anno Domini, quasi in omnibus galeis quae transfretabant per mare, duo in banco remiges remigabant: postmodum perspicaciores homines, cognoverunt quod tres possent remigare remiges superquodlibet praedictorum, quasi omnes ad praesens hoc utuntur. Ob quod nemini debet videri grave, ponere remiges quatuor vel quinque, pro banco quodlibet magnarum cuiuslibet galearum, postquam probatum est. Nam bene invenitur in scriptis, quoniam antiquo tempore Romanorum tres pro banco quolibet erant remiges remigantes. Reperitur etiam in Vegetio de re militari, ubi ipse tractat de navali bello, quod quaedam navigia quae Liburnas appellat, antiquo tempore remorum signulos ordines habuisse; paulo vero maiora binos; alia vero idoneae mensurae, ternos vel quaternos ac quinos etiam sortiebantur remigio gradus.* Vegetius's interpretation of the four or five levels of oars is incorrect, as the highest number of banks used on ancient galleys. Hence, four and five actually refer to the numbers of rowers on each side.

any decisions concerning the construction of the quinquereme pending, and resolved not to vote for an official decree.

In order to realize his “Greek dream,” however, Fausto did not resign and accept the Senate’s indecision. On 23 May 1526 Fausto again presented before the Senators of the Council of Ten. He read his request (*supplica*) for building his quinquereme reported as follows:

Most Serene Doge, since I, Vetor Fausto, see that your affairs are such that they do not permit you neither to solve my case nor to vote in my favor, as it has been promised to me, I believe it would not be inconvenient if I remind by this speech I wrote to Your Sublimity and to the most Excellent Lords [of this Council] my request. Consider, please, that it is almost seven years since I have returned to this city, and I was extremely pleased to be appointed professor of Greek, even though I received only half of the salary I could have perceived from the Lucchesi and from the Ragusans, as it is documented from public scripts. But I was willing to show to Your Sublimity all the knowledge I gained after many labors, perils, and hard work all over the world. Indeed, I became acquainted with several seamen of different countries, namely Catalans, Provencales, Normans, Biscaynes, Genoese, and others; and I have visited several maritime cities in Spain, France, Italy, and in other [countries], and I have spoken with many Sea Captains, among which were Piero Navarro, Pier Jam Bassà, the Gobbo from Dalmatia, and Doria; and I have spoken with the master shipbuilders of Naples, Genoa, and Pisa; and, therefore, I found out that the quinquereme, which was the great and fast galley that the Romans used in naval warfare, would be the mistress of the sea and it would defeat any other ship, since it is extremely seaworthy and could withstand any sort of whether. Thus, I myself designed the quinquereme according to the measurements I found in the most ancient Greek texts, and, successively, I came before this Council and presented my project to you, most Excellent Lords, and to the master shipbuilders of the Arsenal. I clearly stated that my quinquereme could have carried one cannon of more than 15 *miara*, in addition to the smaller ones, and that, at the bow, it could have hurled a 100 *libbre* iron [ball], which would be easily capable of sinking any armed ship. Furthermore, since my quinquereme would be quite huge, it could be laid at anchor

offshore together with the other large ships. Moreover, my quinquereme would be a great advantage during naval warfare: thanks to its design and to the number of oars, it would sail as fast as the light galleys. I assert that my quinquereme will have all these features and will confirm this claim. Indeed, [also] the master shipbuilders of the Arsenal of Your Sublimity, after they carefully evaluated the proportions of my quinquereme, said that the ship would confirm the above mentioned claims and it would be fast, when provided with the rowing system I have designed consisting of the [five] oars pulled together at the same time. However, [the master shipbuilders] said that they are unable to build and to set in motion [the rowing system] of my quinquereme. Therefore, I proposed to build it on my own, so that I could demonstrate how the fifth oar [on a quinquereme] would row better than the third [oar on a trireme] does at the present [on the other galleys], on condition that Your Sublimity would ask to Pope – since my quinquereme would be beneficial to all the Christian world – to provide me with a salary of 500 ducats from the Confraternity [of the Knights] of Rhodes, and, in the meantime, Your Sublimity would provide me with an income of 150 ducats per year. Although Your Sublimity and the most Excellent Lords appeared to promptly approve my project, nonetheless any judgment has not been pronounced so far. However, since I know that Your Sublimity has the intention to build new warships in order to defeat the Western corsairs, and has in mind to build a new fleet regardless of the expenses, I present again my quinquereme that will confirm all the above claims, which, neither light galleys, small galleys, great galleys, nor large galleys can achieve, as they cannot sail with the wind. And I assert that I will demonstrate the rowing system, in which five men pulling the oars together at the same time would row better than the three men on light galleys. In the case my quinquereme will not be approved by the expert [master ship builders], and in case Your Sublimity will not experience the truth of what I am asserting, then, I will forego any reward. To set things straight, since the construction of the hull of my quinquereme involves great expenses, Your Sublimity should provide me with a great galley from his Arsenal, so that I can arrange on it the rowing system accordingly to its cargo capacity based on the height of the depth in the hold. So, Your Sublimity will see the great advantage of my quinquereme, although not yet built, but still Your Sublimity will realize, either way, what the final result of one of my quinqueremes would be when completely realized with all its proportions. Then, Your Sublimity will decide, at his discretion, whether I deserve a reward or not, based on my innovations, which, I hope, will be wonderful and great. These are, Most Serene Doge and Excellent Lords, the things that a

humble servant has been trying to acquaint himself with all over the world, thanks also to the ancient Greek and Roman texts. And now I offer to Your Sublimity my knowledge, which will confer to this rich city great prestige, benefit, and safety. It should not be that you, Excellent Lords, who are considered the wisest all over the world and the most expert in naval warfare, despise me, such a humble servant, and disregard my project, since very few quinqueremes would suffice to ruin any enemy's fleet. Therefore, with great deference, I request what I am asking will be fulfilled, and that one of my servants and I be allowed to carry arms, for the reasons that Your Sublimity well knows.<sup>289</sup>

Fausto's proposal of testing the rowing system first on a great galley must have motivated the Lords of the Council to reexamine Fausto's project. With the official decree dated to 23 May 1526, the members of the Council of Ten decided "...that the request *dominus* Vetor Fausto has just read for building a quinquereme has to be examined by the Council of the *Pregadi* in order to vote on Fausto's petition, excepting the request of carrying arms, which is not under our authority."<sup>290</sup>

On 30 July 1526 the Council again discussed Fausto's request. A few weeks later on 22 September 1526 the proposal of building a quinquereme finally arrived in the hands of the Venetian senators.<sup>291</sup> A document from the Correr Museum from the end of the 16<sup>th</sup> century recorded that "many master shipbuilders were opposed to the proposal of the audacious shipbuilder, but the senator Bernardo Navagero spoke in favor of

---

<sup>289</sup> ASVe, Consiglio di Dieci, Parti segrete, fold. 1, folios not numbered. On the reverse: *Supplica del Fausto* ("Request by Fausto"). See APPENNDIX I, doc. 2.

<sup>290</sup> ASVe, Consiglio di Dieci, Parti segrete, reg. 1, fol. 62r. See APPENDIX I, doc. 3. The Council of the *Pregadi*, or Senate, which was established in 1229, consisted of Venetian Senators who were requested (*pregadi*) to deliberate on matters of foreign politics and every day matters.

<sup>291</sup> ASVe, Consiglio di Dieci, Parti comuni, fold. 2, fol. 51v; Patroni e Provveditori all'Arsenal, fold. 7, fol. 64r; Collegio, Notatorio, reg. 7, fol. 93r.

Fausto at the presence of the members of the Senate and supported him against his detractors.”<sup>292</sup> Finally, the Senate accepted and approved Fausto’s request:

The [members] of this Council have listened to the proposal of building a quinquereme by our humble servant Vetor Fausto. Our master shipbuilders have examined carefully the design [of the ship] and it has been approved. However, there is still some doubt concerning its rowing system which inevitably has to be tested prior to its construction. If the rowing system is successful, it would greatly increase both the good reputation and the safety of our city. Therefore, it has been decided that the above mentioned Vetor has to come before this Council and demonstrate the oar mechanics of his quinquereme in the presence of the Most Serene Doge and the experts to be selected by the members of the Council. In the event the rowing system is proven to work, the Patrons of our Arsenal will immediately have to provide him with a ship-shed, which has to be locked up in order to permit entrance only to the shipwrights selected to build the quinquereme. Moreover, [it has been decided] to provide Fausto with all the necessities, such as workers, wood, and supplies he will need in order to build his quinquereme without further delay. Conversely, if the Council realizes that the [demonstration of the] rowing system is not doable, then a great galley (*galia bastarda*) from our Arsenal should be allocated to Fausto, so that he can adapt the oars on this great galley and demonstrate the rowing system he invented. The Patrons [of the Arsenal] have to provide him, therefore, with all the necessities Fausto asks, in order to avoid any delay in the construction. Once the rowing system [on the great galley] is proven to work and to be effective, then, a ship-shed to build the quinquereme should be immediately assigned to Fausto. In order to properly reward his work, which is so important for the reputation of our State, it has been decided that [Fausto] will receive his reward.<sup>293</sup>

---

<sup>292</sup> BCVe, Ms. Gradenigo 170, fol. 66r: *Alcuni proti dell’arsenale furono contrarii al valoroso fabbricatore, la il senatore Bernardo Navagero diffese il Fausto nel Senato e prese la protezione di lui a fronte degli avversari.*

<sup>293</sup> Sanuto, XLII, col. 765 and 766: *Questo Conseio ha inteso per la suplication hora lecta, quanto il fidelissimo nostro domino Vetor Fausto promette di far circa la galia quinquereme, il modello di la qual essendo stà visto per li proti nostri et aprobatò, resta in dubio solum la voga, et essendo omnino necessario de vederla, che reuscendo saria de grandissima reputation et securtà del Stato nostro, però: l’anderà parte che’l prefato domino Vetor debbi venir in Collegio presente il Serenissimo Principe et quelli pratici che parerà al ditto Collegio, et mostrar la voga de la ditta quinquereme; et essendo qualla aprobatò come reussibile, siano obligati li Patroni a l’Arsenal nostri deputadi a far la ditta quinquereme,*



A practical demonstration of how “...the five men pulling the oars together at the same time would row better than three men on the light galleys...”<sup>294</sup> was the *conditio sine qua non* for the construction of the quinquereme. Unfortunately, records about the circumstances of the demonstration of the rowing system do not exist and it remains unknown whether Fausto ever adapted five oars to the hull of a great galley. Nevertheless, it seems that Fausto convinced the master shipbuilders of the Arsenal. Indeed, a few weeks later in October 1526 Fausto – the famous lecturer of Thucydides, Aristophanes, Pindar and Hesiod – started the construction of his quinquereme, working alongside shipwrights in the Arsenal.<sup>295</sup> The construction of the quinquereme in the Venetian Arsenal lasted almost three years. Likely, the ship-shed assigned to Fausto was located in the *Arsenale Novissimo*, “the most recent area” added to the existing Arsenal in 1475.<sup>296</sup> The construction of the hull of the quinquereme and its upper structures was completed in the first days of 1529. On the morning of 11 January 1529,

The Most Serene Doge, wearing a garment of velvet and a coat on his shoulders, went to the Arsenal, together with all the members of the College, about ten Procurators, and ten other Senators who were in saint Mark’s square and had been invited, among whom were *sier* Andrea Mudazo and *sier* Piero Lando, who were the Superintends of the Arsenal. [The Most Serene Doge] made his entrance through the New Arsenal, and there he saw the ships (*barze*) that were being built, one of which was

---

*et darli ogni possibile et celere expeditione, sì de maistranza, legname come de ogni altra cosa che li accaderà per il compir di la ditta galia, senza interposition de tempo. Quando veramente al Collegio nostro la voga monstrata non paresse reussibile, in questo caso li sia data una galia bastarda di l’Arsenal nostro sopra la qual ditto domino Vettor habbi a monstrar la voga, conzada la ditta galia a suo modo, et siano obligati li ditti Patroni darli similetr ogni possibile expeditione de quando el ditto li richiederà; et reussendo la ditta voga, li sia consegnato il volto per far immediate la ditta galia ut supra.*

<sup>294</sup> ASVe, Consiglio di Dieci, Parti secrete, reg. 1, folios not numbered (see APPENDIX I, doc. 2).

<sup>295</sup> Sanuto, XXVI, col. 52, 107, 127; XXXVII, col. 195. See also: Agostini 1754, II, 448-72.

<sup>296</sup> On the Arsenal of Venice, see the studies by Concina 1984; 1991a, 147-210; and also Aymard 1987-407-18.

almost completed. He also saw the quinquereme built by Vettor Fausto, who was there and explained all the shipbuilding sequence, and stated that it was accomplished.<sup>297</sup>

The construction of the quinquereme completely absorbed Vettor Fausto. Moreover, considering that Fausto was not a skilled shipwright, building a ship for the first time *ex novo* would have been a demanding task. In a long letter written to his friend Giovan Battista Ramusio and dated to 13 September 1530, Fausto compared the days of his intense work at the Arsenal to Heracles' descent into Acheron:

I have arrived at the place where the Venetians build their ships, which is almost like Acheron. And I came there through a difficult and abysmal path, though a cave with huge and pointed stones hanging from the ceiling where there is constantly the thick darkness of Hades, as the poet said with slightly different words. When the past year, with hard work, I achieved the same fame that Hercules achieved – if I may compare myself to the ancients – at the moment when he arrived in Hades. Hercules, however, was at least accompanied by Theseus, who helped him to escape the jaws of the terrible Cerberus, and eventually [Heracles] succeeded in returning to world to see light again. I, instead, was completely left alone, and although I do not owe anything to anyone, no one helped me, and I had to fight alone against the ignorance and the naughtiness of Cerberus, so to speak.<sup>298</sup>

---

<sup>297</sup> Sanuto, XLIX, col. 357: *A dì 11, la mattina. El Serenissimo vestito di veludo cremesin et di sopra un manto aperto su le spalle, con il Collegio tutto, et procuratori zerca 10, et altri 10 senatori vicini a San Marco mandati a invidar, et tra li altri sier Andrea Mudazo et sier Piero Lando provedadori a l'Arsenal, anoe con li piati a l'Arsenal et intrò per l'Arsenal nuovo: vide le barze si fa, una de le qual è quasi compita; vete la galia quinqueremi qual ha fatto far Vettor Fausto, el qual era lì et diceva le opration sue et esser reussita.*

<sup>298</sup> Fausto, 1530 (Letter to Giovan Battista Ramusio): *Adsum adque advenio Acheronte vix via alta atque ardua, per speluncas saxis structas asperis, pendentibus, maximis, ubi rigida constat crassa caligo inferum, ut ait poëta haec enim, paucis immutatis, Veneto navali convenient: ubi anno superiori, mango meo cum labore, talem sum denique visus gloriam assequi, qualem, si priscis licet nostra componere et Hercules olim ad inferis reportavit siquidem ille, non tamen Theseo, Cerberum, ab orchid faucibus abstractum, coelo atque huic luci ostendit, unus ego, nemine adiuvante, imo utinam non multris eorum, qui minime debuissent, contra nitenti, tot ab invitis, ut ita dicam, Cerberis ignorationem quondam cum malignitate coniuctam avulse.* In: Weber 1894, 79-80.

Fausto's metaphor not only likens his hard work to that of the labors of Hercules but, most of all it is an explicit reference to "the ignorance and the naughtiness" of the conservative, Venetian master shipbuilders who employed traditional shipbuilding practices.

Remarkably, Fausto's quinquereme became famous even before it was launched. On 31 March 1526 Giovanni Contarini, known as *Cazadiavoli* ("Devil Chaser"), wrote a letter from the harbor of Trani to Lunardo Emo, the Superintendent of the Arsenal. In the letter, Contarini "asked to send [to Trani] the quinquereme that had been built by Vettor Fausto in the Arsenal, and said that, sailing onboard the quinquereme, he could achieve great deeds, and defeat four galleys of Andrea Doria."<sup>299</sup> However, the quinquereme remained unarmed and yet to be outfitted. Less than a month later, on 28 April 1526, "...in the Arsenal, it was launched. The quinquereme had been built by Vettor Fausto, who designed it and who is [also] a professor of Greek [...], however, most of the people believe that [the quinquereme] would be a failure. They said that on 6 May, on the day of the *Sensa* Feast, [the quinquereme] will take part in the parade on the Canal together with the *Bucintaur*."<sup>300</sup> Apparently, however, the quinquereme did not take part in this important Venetian festivity, for it was not yet ready.

---

<sup>299</sup> Sanuto, L, col. 147: *Fu letto una lettera di sier Zuan Contarini, Cazadiavoli sopraditto, proveditor di l'armata, di Trani, di ultimo, scritta a sier Lunardo Emo el consier. Supplica li sia mandà la galia quinqueremes fatta far per Vettor Fausto in l'Arsenal, con la qual promette far gran cose e prendere 4 galie di Andrea Doria.*

<sup>300</sup> Sanuto, L, col. 227: *in l'Arsenal, fo varato la galia quinqueremes, fata per Vettor Fausto, leze in greco, zoè datoli il sesto [...] ma per iudicio de la più parte non reuscirà. Se dice il Zuoba di la Sensa, che sarà a di 6 Mazo, sarà vogata per canal insieme con il bucintoro.*

The first official ceremony occurred on 21 May 1526. The historian Sanuto, who was present at the parade and saw the quinquereme from Saint Anthony, on the Lido di Jesolo, between Venice and Chioggia, recorded the following:

This morning, the quinquereme was launched in the Arsenal; [onboard] there were the rowers of the ferry-boats, and *sier* Alvisè Sagredo, Patron of the Arsenal, was the captain. [The quinquereme] sailed up to Chioggia, as if it was vaulting [...] It was armed with its full load of artillery to make it steady on the water, and it had also a culverin weighting...on the bow, the captain was *sier* Alvisè Sagredo, Patron of the Arsenal, and Vettor Fausto, who designed the ship, was the admiral...there was also the crew...the quinquereme was escorted by the galley of *sier* Agustin da Mula, who had been the Proveditor to the Fleet, and, together with the noblemen, [the quinquereme] sailed up to Saint Anthony, where I was standing and had the occasion to admire it. I saw that the rowers were rowing all together in unison, and then the ship saluted three times Saint Anthony, as it was the custom, and then it turned and sailed back very fast, and arrived at Saint George Major, and, there, it also saluted, and then it arrived in front of Saint Mark.<sup>301</sup>

Among the crew there were the professional rowers in the galley of Francesco Bondumier, "...who just arrived in Venice from Istria, and he wants a new galley, and his crew temporarily went aboard the quinquereme."<sup>302</sup> Amid general skepticism, the quinquereme had been launched, but the Doge and the Superintendents and Patrons of

---

<sup>301</sup> Sanuto, L, col. 345 and 346: *A dì 21, la marina. In questa matina, la galia quinquereme trata di l'Arsenal con li homeni de trageti, capitano sier alvisè Sagredo patron a l'Arsenal per condurla a Chioza, andò voltizando [...] la galia quinquereme ussita de l'Arsenal, carga de artellarie aziò l'habi el suo peso, con una colubrina de...a prova, capitano sier alvisè Sagredo patron a l'Arsenal, armirao l'autor di essa Vettor Fausto, comito...et con la zurma,...si levò de dove l'era sorta, con la coperta di la galia de sier Agustin da Mula fo proveditor in armada, e con li nobeli, et vene vogando fino a Santo Antonio, dove io era et la vidi vogar tutti a un tempo et ben, per quanto si potè veder, et salutato tre volte Santo Antonio, justa el consueto, la voltò et ritornò a segunda de aqua et de vento molto velocemente, et andò a San Zorzi Mazor, et salutò etiam lì et per mezo San Marco.*

<sup>302</sup> Sanuto, L, col. 343: *Gionse la galia soracomito sier Francesco Bondimier in questa terra hozi, la qual era in Istria, venuto a cambiar la galia, et la zurma si adopererà sopra la galia quinquereme.*

the Arsenal were still concerned about its speed. Therefore, it was decided to test the quinquereme in a race with a light galley, and to determine whether the great size and heavy armament compromised the claimed qualities of the quinquereme. The race against the light galley *Cornera* was held on 23 May off of Lido, just two days after the quinquereme's launching in the Canal. Sanuto wrote an enthusiastic report celebrating Fausto for this revival of Greek science:

After lunch, since today was the day fixed for testing the rowing system of the quinquereme, the latter, together with the light galley under captain *sier* Marco Corner, son of *sier* Piero from Saint Marguerite, sailed toward Malamoco, the starting point [of the race] from where they would have begin the race, rowing one against the other to see who would have been the faster. Therefore, after vespers His Serenity invited all the ambassadors, except those from Urbino and Mantua, and with their boats and accompanied by many nobles, among which was *sier* Vetur Morexini, they went to the castle, called New Castle,<sup>303</sup> where seats had been prepared under a cover from the sun. And there were an infinite number of boats outside the two castles<sup>304</sup> and throughout the Canal,...and many people from Padua and from Chioggia aboard many ships, and today some gondolas have been paid eight or ten *lire* just to see such a thing. I saw many ladies in boats, and the Procurators, and finally the Most Reverend Cardinal Pisani with the Archbishop of Nicosia and with D. Lippomano from Padua. Now, at the fixed hour, when the signal was given, the said galleys came rowing, racing one with the other, and in front rowed the [light galley] *Cornera*, but when they had almost arrived at the castles, the quinquereme was on the outside, and the *Cornera* hugged the land so close that the quinquereme passed it in front of His Serenity and so came ahead, rowing as far as Saint Mark, with so many boats in the Canal, and sails of large barks and fishing boats that it seemed like an armada. It was most beautiful to see. This quinquereme has great power in its oars, but the benches are a little more angled compared to those of the other light galleys, so

---

<sup>303</sup> *Castel Nuovo* (New Castle) is also known as the Castle of Saint Andrew. It was built as part of the defenses on the Lido islands.

<sup>304</sup> The second castle was the Castle of Saint Nicolas, which is also known as the Old Castle (*Castel Vecchio*).

that Vettor Fausto, the author who designed it, will be immortal.<sup>305</sup>

The race between the quinquereme and the galley *Cornera* is echoed in a letter dated to 29 May 1529, which was written by Pietro Bembo (1470-1547) and addressed to Giovan Battista Ramusio (1485-1557):<sup>306</sup>

I was extremely glad to read the good news you wrote me in your past exultant and joyful letter about the success and victory of our Fausto, and about his quinquereme that has been recovered from ancient times and that won the race against the trireme, at the presence of the Most Serene Prince of the Senate, and the entire city of Venice. I received this news last night [...] I first read [the letter in which you wrote] that the two ships were racing at the same height, sailing in front of the Doge, and that the trireme sometimes passed the quinquereme a little. Then I read your second letter in which you told how Fausto, standing in the middle of the quinquereme, encouraged his rowers to show their virtue, and that, in doing so, he passed the trireme that seemed [immobile] as a rock so quickly that it seemed to everybody a marvelous thing [to see]. I was exulted with happiness you gave me with this news. My happiness doubled in my soul when, slightly later, I read that the Doge, who was

---

<sup>305</sup> Sanuto, L, col. 363: *Dapoi disnar, per esser zorno deputato a veder vogar la galia quinqueremes, la qual questa matina insieme con la galia soracomito sier Marco Corner, quondam sier Piero da Santa Margherita andò verso Malamoco, per venir poi a hore 19, con l'acqua a seconda, insieme vogando, per veder chi voga più presto. Et però poi vespero il Serenissimo, invitato gli oratori tutti, excepto Urbin et Mantoa, con li piati et zentilhomini molti, tra li qual sier Vettor Morexini, andoe al castel, chiamato Castel nuovo, dove fu preparato da sentar con tapezarie er coperto per il sol, et barche infinite poi fuora di do castelli et per canal; fo stimato da barche numero...et fino barche di Padoa con persone dentro, di Chioza una infinità di barche, et tal gondola è sta pagata per hozi lire 8 in 10, solum per veder tal cossa. Donne assai in barche, et procuratori, et fino con l'arziepiscopo di Nicosia Podacataro in barcheta con D. Lippomano primocerio di Padoa. Hor ditte galie e l'hora deputata, trato un signal, veneno vogando a regata una di l'altra, et prima vogava la Cornara, ma zonti quasi a li Castelli, la quinqueremes era di sora, et pense tanto la Cornera a terra che la passò davanti il Serenissimo, et cussì vene avanti vogando fino a San Marco, con tante barche per canal et velle di barche grosse state in pielago che pareva una armata. Fo bellissimo veder. Questa galia quinquereme ha la sua vuoga ma è poco avanti di le altre galie sotil; sichè Vettor Fausto, autor di darli il sesto, sarà immortal. Et dapoi, venuta la Signoria a San Marco, ditta galia cinqueremi vene vogando per canal grandando fino a la chà Foscari, dove la zirò, ma con grandissima fatica per esser longa passa 28, è più che passa tre più di le sotil. Et era grandissimo numero di barche per canal grandando, tra le qual io vi fui, et durò la festa fino sera.*

<sup>306</sup> Giovan Battista Ramusio is the father of Paolo Ramusio, who, in 1551, published Fausto's *Orationes quinque*.

hoping that that Fausto would win, was not able to retain his tears from happiness when he saw that his wish came true [...] Oh, my dear Fausto, how happy you must have been when such a high personality [the Doge], so old and affected by infirmity, cried for he was deeply touched by your victory.<sup>307</sup>

### The Naval Career of Fausto's Quinquereme

After launching, Fausto's quinquereme was immediately sent to Greece to protect Venice's overseas dominions (*dominio da mar*). On 29 June 1529, the Proveditor to the Fleet Michiel Morosini spoke in front of the senators about the urgency of reorganizing the Venetian fleet since the Holy Roman Emperor was approaching with his navy to the coasts of France.<sup>308</sup> Morosini exhorted the Council to finance, to the sum of 15,000 ducats, the Venetian fleet that had just left sailing toward Greece.<sup>309</sup> The Sages of the Council, at first reluctant to devote such a huge amount of money to naval warfare, immediately agreed with Morosini's proposal when they received news that "the Emperor arrived in Monaco, which is dangerously close to Genoa. Thus, in

---

<sup>307</sup> Bembo, letter n. 975: *M'avete rallegrato con le vostre lettere scritte mi dell'onorato successo e vittoria del nostro Fausto, e della sua a questo secolo nuova gaea cinquereme avuta in contesa pubblica con quella degli tre in presenza del Serenissimo Principe e del Senato, e in fine della città tutta, le quali io ieri a notte ricevevi [...] quando io, letta quella parte, dove dite le galee esser venute quasi per infino alla presenza del Principe di pari corso, ed alle volte a trireme aver passato la cinquereme d'alcun poco spazio, lessi poi quell'altra che segue, dove narrate che il Fausto, messosi per lo mezzo della galea inanimava i suoi galeotti a mostrar la loro virtù, e che egli allora in un punto passò la trireme non altramente che se ella fosse stata uno scoglio con tanta velocità che parve a ciascuno cosa meravigliosa, io non potei tenere la voce dalla dolcezza che mi recò quella lettura. La qual dolcezza poi più abbondantemente ancora mi si raddoppiò nell'animo, quando io poco dappoi lessi che il Principe, il quale dubitava che il Fausto perdesse vedendo quel fine non ritenne due lacrime dalla molta gioia che egli ne senti.* In: Travi, 1992, 3: 45.

<sup>308</sup> Sanuto, L, col. 568.

<sup>309</sup> ASVe, Senato mar, reg. 21, fol. 141v.

accordance with the Council, yesterday, we have already sent the quinquereme to the Captain of Sea, and we have sent him a letter.”<sup>310</sup>

Gerolamo da Ca’ Pesaro was elected Admiral of the Fleet on 10 June 1529. He was an experienced seafarer and had previously been Captain of the Flanders galleys. The Sages of the Council established that Gerolamo da Ca’ Pesaro had to outfit five light galleys, whose commanders (*soracomiti*) would have been *sier* Zuan Francesco Donado, *sier* Almorò Barbaro, *sier* David Bembo, *sier* Zuan Battista Zorzi, and *sier* Bernardo Sagredo.<sup>311</sup> However, given the serious threat of Charles V stationing in France, the Great Council added seven more commanders to those already elected.<sup>312</sup>

On 18 June 1529 the Senate urged Gerolamo da Ca’ Pesaro to leave immediately with his fleet, “since we received the news that [Andrea] Doria, who is at the service of Caesar, sailed from Genoa to Barcelona with his galleys and ships. Therefore, we should expect that His Majesty will arrive in Italy soon, and we have to be prepared to this eventuality.”<sup>313</sup> The Venetian fleet’s departure was fixed on the 27 of June. A few days before, on 24 June, the Senate elected Gerolamo da Canal, previously the Captain of the Gulf, as the Captain of the quinquereme.<sup>314</sup> The Senate, given the urgency of the situation, decreed at the very last moment, “without filing any formal request [to the

---

<sup>310</sup> Sanuto, LI, col. 286: *Fu posto, per i Savi tutti, una lettera al Capitano zeneral di mar. Come havendo hauto nova del zonzer di l'imperador a Monaco vicino Zenoa, però col Senato li scrivemo haver expedito heri la galia quinquereme.*

<sup>311</sup> Sanuto, LI, col. 462 and 464.

<sup>312</sup> Sanuto, LI, col. 464 and 483.

<sup>313</sup> ASVe, Senato Mar, reg. 21, fol. 141v; Sanuto, LI, col. 506.

<sup>314</sup> Sanuto, L, col. 544 and 545.



Council], [...] that also Gerolamo da Canal, captain of the quinquereme, would have left soon.”<sup>315</sup>

The historian Sanuto described the preparations of the expedition. On 26 June “the galley [of Gerolamo da Ca’ Pesaro] was brought to Saint Mark in order to gild its poop, and during the previous night, by means of huge rollers, the galley was pulled up on shallow waters and put on land. The galley was adorned with flags, and had a beautiful lantern and other [decorations], as was the custom.”<sup>316</sup> Sanuto also described the departure ceremony. On the morning of 27 June the Admiral Gerolamo da Ca’ Pesaro accompanied by the Doge, the Senators, noblemen, the procurators, the foreign ambassadors living in Venice, and the commanders of the light galleys, gathered in the church of Saint Mark for the solemn mass and blessing of the banner depicting the lion of the patron of the Republic of Venice. However, “the captain of the quinquereme, while the mass continued, left the church and went to set the benches (*metter banco*) to his galley, accompanied by *sier* Michiel Morosini and *sier* Zuan Moro, Proveditors of the fleet, and by the other commanders, and then, he went back to the mass.”<sup>317</sup>

Evidently, Gerolamo da Canal wanted to leave with the Venetian fleet and “...he wanted

---

<sup>315</sup> Sanuto, L, col. 560: *Et etiam, senza meter altra parte per il Collegio, fo terminà che sier Hironimo da Canal, governador de la quinqueremi, etiam lui mettesse banco.*

<sup>316</sup> Sanuto, L, col. 560: *La sua galia, del capitano, heri fu condotta a San Marco, non compito ancora di indorare la pope et, per il seco, tutta questa notte con burchiele fu cavato aziò la potesse arivar, etiam levarse, per li gran sechi fa la matina. La qual galia era adornata di bandiere, fanò bello et altro, justa il consueto.* It is interesting to note that the Admiral galley, in 1529, was carrying a single lantern, meaning that the use of three lanterns was a later practice.

<sup>317</sup> Sanuto, L, col. 561: *Digandose la messa, sier Hironimo da Canal governador di la quinqueremi, in mezo di sier Michiel Morexini et sier Zuan Moro proveditori sora l’armar, acompagnato da procuratori, tutti li soracomiti, andò a meter banco, poi tornò in chiezia.*

to arm and outfit [the quinquereme] now, but the hemp to make to ropes had not yet arrived, and it should have on 20 July.”<sup>318</sup>

The quinquereme, however, was further delayed in its departure and left on 1 August 1529. That morning, the quinquereme slowly left the Arsenal and arrived at the Bridge of the Straw (*ponte de la Paia*), next to the Doge’s Palace, where the enlistment of the rowers would take place. The presence in Venice of a group of Spanish refugees from Istria was providential. The College immediately enlisted them among the rowers of the quinquereme.<sup>319</sup> It seems that one of the main problems of the quinquereme was gathering 280 oarsmen needed to fill the 28 benches running on either side of the ship. Around mid-August, Gerolamo da Canal departed from Venice. On 10 September 1529, while sailing along the coast of Dalmatia, he wrote a letter to the Senate complaining that “he was not able to find enough rowers (*interzare*), he could not find available men, and that he had only one hundred men, and he needed [more].”<sup>320</sup> On 19 November the quinquereme arrived in the harbor of Corfu, where it joined the Venetian fleet of the Admiral Gerolamo da Ca’ Pesaro.<sup>321</sup> The Admiral in charge of faithfully reporting to the Venetian Senate all important matters pertaining to the naval expedition wrote a letter to the Senate saying that the quinquereme needed forty more rowers.<sup>322</sup>

In the meantime, at the request of the Senate, Fausto had built two more quinqueremes in the Arsenal of Venice. The new two ships, named *Zorzi* and *Bemba*,

---

<sup>318</sup> Sanuto, L, col. 566: *El qual Canal voria armar adesso [...] perchè non è li canevi zonti, nè saranno fino 20 lujo, da far corde.*

<sup>319</sup> Sanuto, LI, col. 222.

<sup>320</sup> Sanuto, LI, col. 516: *Come non pol interzar la galia, non trova homini, ha solum 100, et ne bisogna...*

<sup>321</sup> Sanuto, LII, col. 346.

<sup>322</sup> Sanuto, LII, col. 346.

were sent to join the fleet of Gerolamo da Ca' Pesaro. They were assigned to Zuan Battista Zorzi and to David Bembo respectively.<sup>323</sup> Both arrived in Corfu towards the end of November, slightly after the quinquereme of Gerolamo da Canal. The Admiral recorded in his letter to the Senate that the Bemba was missing ten rowers.<sup>324</sup>

Soon afterwards the Senate ordered Admiral Gerolamo da Ca' Pesaro to return to Venice and disarm the galleys, "except those that were in Cyprus, that is to say [the quinquereme] of the Captain Gerolamo da Canal, and ten galleys."<sup>325</sup> At the same time, the Senate allowed the Captain to transfer to his quinquereme the rowers from the ten light galleys that were also in Cyprus. The Senate's decision to recall and disarm the fleet resulted from the peace concluded on 14 October 1529 by Suleiman and the Holy Roman Empire.<sup>326</sup>

News of the peace arrived in Venice on 29 December, when the Ottoman ambassador docked his ship in front of Saint Mark square and was welcomed by Venetian noblemen and former *bailo* to the Sublime Porte. On the same day, the Senate ratified the peace treaty and ordered the Venetian fleet to return to Venice, leaving the quinquereme behind in Cyprus.<sup>327</sup> This decision flamed discussion amongst the senators and did not meet the approval of a group of patricians, who wanted to keep in Greece "the new and well-designed galleys" that had been recently armed at the Arsenal.<sup>328</sup>

---

<sup>323</sup> Sanuto, LI, col. 286. In Venice, ships were referred to by the last name of their captains in the feminine form.

<sup>324</sup> Sanuto, LII, col. 346.

<sup>325</sup> Sanuto, LII, col. 393: *Exceto do sono in Cipro, il governor di la quinquereme, con 10 galie.*

<sup>326</sup> ASVe, Senato Mar, reg. 21, fol. 161v.

<sup>327</sup> Sanuto (LII, col. 100-102) provides a list of all the Venetian galleys, with their corresponding captains who came back to Venice, or were about to, in order to be disarmed.

<sup>328</sup> Sanuto, LII, col. 393.

Therefore, the Senate decreed that ten light galleys had to remain in service in Cyprus in order to better protect the Republic's *Stato da mar*.<sup>329</sup>

From the senatorial decree, we learn that the oarsmen of the ten light galleys, if needed, could have served on board the quinquereme. However, during the first days of January 1529, Captain Gerolamo da Canal sailed to Cephalonia where he enlisted 60 fresh rowers to address the shortage of man power aboard the quinquereme. On 17 January 1529, from the islet of Hydra (Saronic Islands), Gerolamo wrote a long letter to the Signory, praising the technical features of the quinquereme:

Most Serene Prince,

I did not write earlier to you about the excellent quality of the quinquereme both because you had no doubt about it, and also because I recently joined the Venetian fleet [in Greece]. I assert that the quinquereme is different from the light galley, however, I experienced that the quinquereme has perfect sails, both at the stern and toward the bow, it is seaworthy and, as far as its speed, very few galleys could race with it. When I armed and outfitted the quinquereme, as Your Serenity knows, since there were 49 galleys that were operative on the sea, I thought it would have been better if I enlisted Greek rowers, and recently, I have hired 60 Greeks. Of course, Most Serene Prince, if the quinquereme had a crew of expert and professional rowers, very few galleys or none would be faster than the quinquereme. Moreover, I suggest to Your Serenity with reverence that vessels like the quinquereme should not be operating all the time, but only in case of challenging naval warfare. Moreover, Your Serenity, although I am not an expert on naval warfare, I acknowledge that the quinquereme is the best vessel ever built that is able to defeat any fleet of light galleys. Assuming that you arm ten quinqueremes and place them in front of your fleet of light galleys, I am sure that the quinqueremes would stop any enemy attack and would not permit them to damage the galleys. As I told you, Your Serenity, I am not an expert on naval warfare, however, few captains who are in service of the Venetian fleet fought in as many naval battles as I did. I would like to

---

<sup>329</sup> Sanuto, LII, col. 393.

recommend to You that it would be extremely convenient to build 10 quinqueremes, and you must make sure that these vessels will be ready for use in the future. Surely, this type of vessels cannot be afforded all the time, given both its reputation and its expense. Nonetheless, I wanted to write to You these few words about the quinquereme, as good servants who are in charge of important matters of the Republic are required to do. Your Serenity, then, who is very wise, will decide as he pleases.<sup>330</sup>

A few months later, Gerolamo da Canal renewed to the Doge his suggestion of providing the Venetian fleet with ten more quinqueremes. In a letter addressed to the Council on 9 March 1530, Gerolamo da Canal reaffirmed the superiority of quinqueremes over light galleys. As confirmation for this, he asserted that he had defeated some galleys of French privateers.<sup>331</sup> Indeed, Cristoforo da Canal, the nephew of Gerolamo, in his *Della milizia marittima*, recalled that Gerolamo da Canal had engaged in a naval battle with the Barbary corsair Bessaguli in waters around *Cao*

---

<sup>330</sup> Sanuto, LII, col. 594-595: *Serenissimo Principe, se fin hora non li ho significato particolarmente di quanta bontà sia questa quinquereme, la causa è stata ei non esser inquietato, nè manco havermi trovato fra galie. Non li dico che la quinquereme sempre si pol metter nel numero de galie sottil, et sappia certo Vostra Serenità che la vela è perfettissima, sì in puppa come de l'asta, bonissima marinera, et del remo poche galie li anderano avanti. Ancora che io l'habbia armata, come è noto a Vostra Serenità, da poi che era fora 49 galie da Venetia che ho convenuto tuor homeni grezi et ultimamente ho tolto a Cephalonia homini 60 grezissimi, certo, Serenissimo Principe, se questa galia avesse una zurma pratica, over che questa fusse assuefata, certo o poche o niuna galia de l'armata li andaria davanti. Et, parlando cum ogni reverentia, i navili de questa sorte non sono da tenir fuora salvo che in tempo de gran fatione; et sapia certo Vostra Serenità, per quel poco giudicio che io ho di le cose naval, io non cognosco legni che più facile sia a fermar una armata de galie sotil che la quinquereme; che havendone, ne le teste de una armata de galie sotil, 10 quinquereme, io non credo che navili da remo li potesse offender. Et ben confesso a Vostra Serenità io saper poco; ma quella sia certa che pochi nostri pur si hanno trovato in tanti lochi dove le armate di Vostra Serenità hanno fatto fation, quanto io vostro servitor. Ben li aricordo cum ogni reverentia, che 'l non saria se non a proposito che Vostra Sublimità ne facesse far 10; et la sia certa che a qualche bisogno de importantia le torneriano a gran comodo de le cose de Vostra Sublimità. Ben è vero che non sono navili da tenir de continuo, sì per la reputation che etiam per la spesa. Io ho voluto cum ogni reverentia dir queste poche parole a quella, come fanno li boni servitori che hanno cargo de le cose de Vostra Sublimità, la qual è sapientissima et farà quanto li parerà a proposito.*

<sup>331</sup> Sanuto, LIII, col. 18.

*Ducato* (also known in archival sources as Santa Maura, or modern Lefkada, Albania). Gerolamo had won a crushing victory: "...[Gerolamo da Canal], when he was the Captain of the quinquereme, by means of that galleass alone, fought for five hours against three galleys of the corsair Bassaguli from Barbary, who had captured two Venetian galleys off Cape Ducato and was about to run away. But he [Gerolamo da Canal], not only defeated him [Bassaguli], but also killed everybody on board and, without reporting any damage for his part, saved the two Venetian galleys."<sup>332</sup>

Ten days later, Gerolamo da Canal incurred a misfortune, "...while sailing in the direction of Crete, there was such a terrible weather for 14 consecutive days that it was impossible to even cover the ship with its tent, and, as a result, many of the crew almost lost their feet from the cold. *Sier* Piero da Canal, son of *sier* Jacoino, a relative of Gerolamo da Canal who was onboard [of the quinquereme], died."<sup>333</sup> On 9 May 1530, while still in Crete, Gerolamo da Canal suffered more losses, and wrote to the Signory that "...many men aboard the quinquereme had died, and others...could not be paid. He asked for more to be sent to pay the members of the crew, so that those miserable persons can sustain themselves, since they have no means of financing themselves, etc."<sup>334</sup> This pitiful image recalls what Baldissera Quintio Drachio wrote about Fausto's

---

<sup>332</sup> Cristoforo da Canal, book 1: *Essendo egli Governatore della galera di cinque remi, con quella sola galera per spatio di cinque hore combatté con tre galere di Bassaguli corsale di Barbaria, il quale aveva preso sopra cao Ducato due delle nostre galere et via se le menava. Egli non solamente lo vinse, ma tagliò a pezzi quanti erano sopra quelle e con niuno o poco danno dei suoi, le due perse recuperò.* In: Tenenti 1962, 58, n. 86.

<sup>333</sup> Sanuto, LIII, col. 118: *Adeo 14 zorni continui mai havia potuto butar la tenda per galia, sichè le povere zurme haveano quasi perso li piedi da fredo. Item, è morto sier Piero da Canal quondam sier Jacoino, era suo nobile.*

<sup>334</sup> Sanuto, LIII, col. 194: *È morti assà homeni di la galia, et altri...per non esser pagati, et si mandi danari per dar sovenzion, aziò quei meschini possano viver; lui non ha el modo de sovenirli, etc.*

quinnereme in his *Visione* at the end of the 16<sup>th</sup> century, "...it was not order, but confusion; it was a hospital and a lazaret, or better, it was a spectacle of death."<sup>335</sup>

Despite this misfortune the quinnereme continued to succeed against the enemy. On 9 July 1530, the quinnereme sunk two fustas belonging to Maltese corsairs, and Gerolamo da Canal wrote to the Senate indicating that he had captured a privateer's ship.<sup>336</sup> A week later, the quinnereme arrived at the harbor of *Capo Malio* (modern Malea promontory, Laconia), to await new instructions from Venice, since the Proveditor of the fleet, Alessandro da Ca' Pesaro, had just died.<sup>337</sup> In Venice, the Senators were discussing the issue of the vacant Admiral position, mostly because "...it is not proper to leave galleys that are at sea without a commander."<sup>338</sup> Therefore, the Sage of the Council proposed to elect *ad interim* either Gerolamo da Canal or Vincenzo Giustinian, who was the Captain of the *bastarde*.<sup>339</sup> The Senators approved and appointed Gerolamo da Canal to the position, and the greatly disappointed Vincenzo Giustinian filed his complaints about the Council's decision.<sup>340</sup>

Thus, Gerolamo da Canal advanced in his career after having fought and defeated many enemy ships and proved himself an expert and qualified captain of the quinnereme. However, the Senate ordered that he had to serve aboard the galley of

---

<sup>335</sup> Baldissera Quintio Drachio, *Visione*, in ASVe, Archivio Proprio Contarini, env. 25, fol. 13r: *Non fu ordine, ma confusione, et fu un hospital, et uno lazaretto, anzi uno spettacolo di morte*. The lazaret was a hospital for those affected with contagious diseases, especially leprosy.

<sup>336</sup> Sanuto, LIII, col. 337.

<sup>337</sup> Sanuto, LIII, col. 349.

<sup>338</sup> Sanuto, LIII, col. 352: *Non è da lassar le galie, sono fuora, senza governo*.

<sup>339</sup> Sanuto, LIII, col. 352.

<sup>340</sup> Sanuto, LIII, col. 382, and 396.

Alessandro da Ca' Pesaro. Thus, the senators decreed that the quinquereme, after eleven months of honorable service in the Venetian fleet, had to return to Venice.<sup>341</sup>

In the long letter that Gerolamo da Canal wrote to the Signory on 17 January 1529, he greatly praised the quinquereme and approved the technical innovations and the work of Vettor Fausto. It was not by chance that on 8 October 1530, a few months after the return of the quinquereme to Venice, that the Council decreed to establish a chair of mathematics at the School of Saint Mark, "...the [Venetian] youth should learn [...] both the liberal arts, which are those that are most useful to men, and those arts that are called mathematical, which have yet to be studied because we do not yet have a lecturer. Therefore, it is established that we should appoint a lecturer in mathematics who will teach the public."<sup>342</sup> Just three years after the return of the quinquereme to Venice and the establishment of the first chair of mathematics, Jacopo Sodoletto published in Venice *De pueris recte instruendis* ("On the good education of children"). Sodoletto stated that "arithmetic and geometry afford wonderful pleasure to the mind," and he related mathematics to Greek *paideia*:

These liberal arts are parts of that great body Philosophy. The mathematical sciences, whether because they train the mind to solitary speculation, or because they, in themselves, are parts of philosophy, must be learned, at any rate in some measure by those who aim at gaining knowledge of philosophy [...] And the

---

<sup>341</sup> Sanuto, LIII, col. 353.

<sup>342</sup> ASVe, Senato terra, reg. 26, fol. 55r: *La gioventù se instruisce [...] delle arte liberal quelle sopra tutte deveno esser cercate che sono più certe esser maggior commodo al viver humano, come sono quelle che se chiameno le mathematiche, delle qual non vedendosi frutto altro perchè in tal necessaria arte non si legge, si deve convenientemente dar modo che sia publice letto in ditta arte.* The lecturer appointed to the newly established chair of mathematics was Giovanbattista Memo, with a salary of one hundred ducats (ASVe, Senato terra, reg. 26, fol. 103r).



student should draw his information on geometry and astronomy from Greek writers, for the Latin treatises are confusing.<sup>343</sup>

After the restoration of Greek science in Venetian naval architecture by Vettor Fausto, mathematical sciences became part of *the* humanities education. Thus, Fausto was not a simply scholar who wasted his knowledge on “vile mechanical arts,” but rather the champion of Venetian *virtus*. Most of all, for the master shipbuilders of the Arsenal, he was *el gran Fausto*, “the great Fausto.”<sup>344</sup>

Vettor Fausto had triumphed!

---

<sup>343</sup> Sodoletto 1737-1738, 3. 117, and 124. In: Rose, 1976, 12. On Sodoletto, see: Douglas 1959. On Venetian humanists devoted to the study of mathematics, see Rose 1969, 191-242.

<sup>344</sup> Bladissera Quintio Drachio, *Visione*, in ASVe, Archivio Proprio Contarini, env. 25, fol. 14v.

## CHAPTER III

THE *MARINA ARCHITECTURA***Introduction**

According to Fausto, his *marina architectura* – naval architecture based on theoretical knowledge applied to shipbuilding practice – aimed to restore in the shipyard the ancient principles, just as they had been restored in terrestrial architecture.<sup>345</sup> In a letter to his friend, the humanist Giovan Battista Ramusio, Fausto claimed that naval architecture had to be based on *litterae et disciplinae*, the “knowledge” which came from the study of ancient works, the “erudite letters.”<sup>346</sup> Indeed, Fausto stated:

Architecture, above all, needs to be based on knowledge. Vitruvius said that architecture relies very little on craftsman’s practice; Archimedes said that it needs such a deep knowledge that it is impossible to write an exhaustive essay about it. If learning terrestrial architecture is truly very difficult, what might we say about naval architecture in which each part (of the ship) is defined not by straight lines – which are to calculate – but by constantly varying curved lines? Naval architecture is closely related to knowledge that defines naval architecture.<sup>347</sup>

---

<sup>345</sup> The phrase *marina architectura* is used by Vettor Fausto in his letter of 13 September 1530 addressed to Giovan Battista Ramusio (Weber 1894, 128-33). For a general view on the concept of architecture during the Renaissance, see Kristeller 1951 166-89; Mandosio 1998 643-704; and Schiavone (2003, 117-72), who discusses the negative attitude of Classical theorists towards the mechanical arts. In this regard, see the brilliant article by Altieri Biagi 1965, 1-12, who discusses the evolution of the terms “mechanical” and “mechanics” from antiquity to Modern times.

<sup>346</sup> Weber 1894, 130. The letter is dated to 13 September 1530. For a discussion of the letter, see below, and also Concina, 1987, 23-8.

<sup>347</sup> Letter to G. B. Ramusio (13 September 1530): *Imo vero nihil usquam est, quod maiorem literarum pene omnium cognitionem requirat quam architecturae profession, quipped cuius rurimam partem, que fabrili peritia continentur, Vitruvius esse contendat: Archimedes autem, tam multiplicis esse solertiae, ut ne scribe quidem de ea ad plenam posse existimet. Ac, si terrestrium aedificiarum difficilis admodum est architectura cognitio: quid de marina illa dicam, ubi non rectis lineis, qua facilis sere ratio est, set curvis, atque iis subinde variantibus, extruenda sunt omnia? Tantum igitur abest, ut a literis sic haec aversa professio, ut sine illis, issque multis omnino stare non possit;* Weber 1894, 130. In his letter, Fausto also

According to Fausto, “marine architecture” does not require mere *fabrilis peritia*, “craftsman’s practice,” but rather *architecturae professio*, “the science of architecture,” based on a shipbuilding principle that emanates from knowledge of Greek and Latin texts.<sup>348</sup>

During the Italian Renaissance, humanists like Fausto rediscovered the value of Classical tradition and of Greek and Latin writers, such as Vitruvius, Livy, Plato, and Cicero, who had previously fallen into obscurity.<sup>349</sup> The rebirth, or renaissance, of the Classical world and its ideas produced a cultural and scientific revolution *ante litteram* that led medieval man into the Renaissance, which reached its highest level with the scientist Galileo Galilei.<sup>350</sup> In Venice, the interest in the Greek and Roman tradition stimulated a radical advancement in many fields: from art and literature to philosophy and architecture. Due to Fausto’s work in the Arsenal, the influence of Classical culture affected great changes even in the traditional, empirical practices employed in shipbuilding.<sup>351</sup> The significance of Fausto’s role lies precisely in the fact that he was the *first* naval architect who had ever worked in the Arsenal, all the more remarkable considering he had no previous shipbuilding experience. As a result, Fausto marked the distinction between the shipwright who built ships empirically by means of his expertise

---

recalls Demetrius Poliorcetes, who not only armed and fitted his fleet, but also built it by his own hand, Plut. *Demetrius*, 20. For a discussion of the letter, see Concina 1987, 23-8.

<sup>348</sup> Weber 1894, 131.

<sup>349</sup> Starthern 2003 81-90 and 172-97. For the revival of Latin and Greek literature in Venice, see Reynolds and Wilson 1975, 137-42; Weiss 1969 and 1977, 36-72; Wilson 1992, 124-57.

<sup>350</sup> For a general overview of the Venetian Renaissance, see Butterfield 1962, 103-17; Ergang 1967, 45-56 and 111-14; Branca 1983; Tafuri 1985; Shapin 1996, 10-23 and 82-96; Grendler 1999, 176.

<sup>351</sup> For Classical influence in urban planning and political structures (*renovatio urbis et imperii*), see Valeri 1958; Tafuri 1984 and 1985; Calabi and Morachiello 1987; Concina 1988 and 1989.

and keen eye, and the naval architect, who based his design on defined principles and methods.

### **The *Navium Ratio***

Vettor Fausto thought that naval architecture, just like terrestrial architecture, might similarly be improved through imitating ancient architects. His purpose was to obtain from the Latin and Greek texts a new source of knowledge that would replace the obsolete and biblical triad of *numerus*, *pondus*, and *mensura*, the heritage of medieval times.<sup>352</sup> During the Renaissance, the art of shipbuilding was based on empirical procedures, which relied on shipwrights' skills and practice.<sup>353</sup> Fausto's proposal to the Venetian Arsenal a "marine architecture" purported to establish the *navium ratio*, the shipbuilding principle.<sup>354</sup>

The two most important sources that influenced Fausto's "marina architectura" were *De architectura* by the Roman Marcus Vitruvius Pollio (80/70-15 B.C.E.) and *De re aedificatoria* (1450) by the Renaissance architect Leon Battista Alberti (1404-1472). In the *De architectura*, Fausto discovered the new concepts of *proportio*, *eurythmia*, and *symmetria*. Vitruvius stated that "architecture consists of order, [...] harmony, and

---

<sup>352</sup> In the *Book of Wisdom* of the Bible (11.21) it is written that God has ordered all things in "measure, and number, and weight." See also *Isaiah* (40.12) and *Job* (28.25). The same concept is expressed by Saint Augustine (*Conf.* 5.4.7; *De civ. D.* 5.11). See Crombie 1959, 1: 22-47; Kristeller 1974, 12-22; Lindberg 1992, 11-76; Katz 1993, 45-51; Eco, 2005, 61-97. The lines from the *Book of Wisdom* are cited by Fra' Luca Pacioli in his *De divina proportione* ("On Divine Proportions," 1509). In Bruschi et al. 1978, 61 and 77.

<sup>353</sup> Chiggiato 1987; Versi 1991.

<sup>354</sup> Letter written by Fausto to Ramusio dated to 13 September 1530. In: Weber 1894, 129.

symmetry.”<sup>355</sup> The Roman architect explained that “...order is the proper balance of each part of the work separately, and, as to the whole, the relation between proportions and symmetry.”<sup>356</sup> Vitruvius specified that the arrangement of proportions to obtain a symmetrical result relies on dimension, *quantitas*, which consists of taking a *modulus*, a basic unit of measure, from the work itself.<sup>357</sup> The *modulus* is the foundation of Vitruvian theory of proportions and symmetry, and establishes the building method, which each architect must diligently practice.<sup>358</sup> Vitruvius wrote that *proportio* is the balanced arrangement (*commodulatio*) of a fixed module (*ratae partis*) that has to be applied to each separate part and also to the whole.<sup>359</sup> The *symmetria* is “...the appropriate harmony arising out from the parts of the building itself and from the correspondence (*responsus*) of the fixed module (*ratae partis*),” which comes from each separate part compared with the form of the whole design (*partibusque separatim ad universae figurare speciem*).<sup>360</sup> Therefore, the *rationis proportio* (*De arch.* 1.1.1) is the proportion, which arises from the calculation of the fixed module (*rata pars*) and could be applied to each field. Vitruvius cited the human body as an example:

---

<sup>355</sup> Vitr. *De arch.* 1.2.1: *Architectura autem constat ex ordinatione [...] eurhythmia et symmetria*. Scranton (1974, 494-9) discusses the passage; Scaglia (1979, 1-30) analyses Vitruvius’ influence on early Renaissance architects.

<sup>356</sup> Vitr. *De arch.* 1.2.2: *dinatio est modica membrorum operis commoditas separatim univarseque proportionis ad symmetriam comparatio*. See also *ordo*, *positura* and *figura* in Lucr. I 685.

<sup>357</sup> Vitr. *De arch.* 1.2.2: *Haec componitur ex quantitate [...] Quantitas autem est modulorum ex ipsius operis sumptio*.

<sup>358</sup> Vitr. *De arch.* 3.1.1: *Aedium composition constat ex symmetriam, cuius rationem diligentissime architecti tenere debent*. For the Vitruvian theory of proportion and symmetry, see Di Pasquale 1996, 499.

<sup>359</sup> Vitr. *De arch.* 3.1.1: *Proportio est ratae partis membrorum in omni opera totiusque commodulatio*.

<sup>360</sup> Vitr. *De arch.* 1.2.4: *Item symmetria est ex ipsius operas membris conveniens consensus ex partibusque separatim ad universae figurae speciem ratae partis responsus*.

Nature indeed has so planned the human body so that the face, from the chin to the top of the forehead and the roots of the hair is a tenth part; also the palm of the hand from the wrist to the top of the middle finger is as much; the head, from the chin to the crown, is an eight part; from the top of the breast with the bottom of the neck to the roots of the hair, a sixth part [...] The foot is the sixth part of the height of the body, the elbow is the fourth part likewise the breast.<sup>361</sup>

So, "...as in the human body the symmetric quality of eurhythmy comes from elbow, foot, palm, finger and the other small parts [...] in ships (it comes from) the space between the tholes, which is called *dipechyaia*."<sup>362</sup> Vitruvius discussed ships in the tenth book of *De architectura*, where he refers to the *symmmetriarum ratiocination* (or "the calculation of the symmetries") applied to ship construction."<sup>363</sup> Vitruvius stimulated Fausto's interest in studying a shipbuilding principle based on proportions that could have been employed in the design of ships.

Leon Battista Alberti (1401-1472), the author of *De re aedificatoria* (ca. 1450) and initiator of Emperor Caligula's (37-41 C.E.) Nemi barges, wrote a *libellus* titled *Liber navis* (ca. 1440).<sup>364</sup> Only a few Renaissance writers knew of this now lost naval

---

<sup>361</sup> Vitruvius, *De arch.* 3.1.2: *Corpus enim hominis ita natura composuit uti os capitis a mento ad frontem summa et radices imas capilli esset decimae partis. Item manus palma ab articulo ad extremum medium digitum tantudem. Caput a mento ad summum verticem, octavae. Tantudem ab cervicibus imis. Ab summo pectore ad imas radices capillorum, sextae [...]. Pes vero altitudinis corporis sextae, cubitus quartae, pectus item quartae.*

<sup>362</sup> Vitruvius, *De arch.* 1.2.4. *Uti in hominis corpore e cubito, pede, palmo, digito ceterisque particulis symmetros est eurhythmiae qualitas [...] navibus interscalmio, quae dipechyaia dicitur.* Lazaire de Baïf (1537, 60) noted that "...in a ship, the fixed distance between two tholes is called *interscalmium*, as Vitruvius wrote in his first book" (*A scalmo interscalmium dictum, quod est spatium inter duos scalmos designatum in ipsa navi. Qua dictione usus est Vitruvius libro primo*).

<sup>363</sup> Vitruvius, *De arch.* 1. 2.4.

<sup>364</sup> Alberti, *De re aed.* 5.12: *Ex navi Traiani per hos dies, dum quae scripsimus commentarer, ex lacu Nemorensi eruta, quo loci annos plus mille CCC demersa et destituta iacuerat, adverti pinum materiam et cupressum egregie durasse;* Bonelli and Portoghesi 1966, 389. Alberti believed the ships belonged to Trajan (98-117 C.E.) and attempted raising the Nemi barges for Cardinal Prospero Colonna by roping

treatise. Leonardo da Vinci (1452-1519) left a brief note on his personal sketchbook that reads, “See *de navi* by Battista [Leon Battista Alberti] and Frontino *de acquadotto*.”<sup>365</sup> In his *De re nautica libellus* (“Book on Nautica”), Lilio Gregorio Giraldi (1479-1552), a nobleman from Ferrara, cited the “booklet by the Florentine Leon Battista that is titled *Navis*.”<sup>366</sup>

The most informative source about the *Liber navis* is Leon Battista Alberti himself.<sup>367</sup> In the fifth book of *De re aedificatoria*, he wrote: “I have already at length discussed the proportions of a ship in another work, the booklet that deals with ships.”<sup>368</sup> In the twelfth chapter of *De aedificatoria*, which is entirely devoted to ships, however, Alberti provided proportions for ships, “In a merchant ship the length has to be three times the breadth, in a light galley at least nine times.”<sup>369</sup> He also provided proportions for masts, “The length of the (main) mast has to be equal to the ship’s length over all.”<sup>370</sup>

The loss of *Liber navis* is all the more deplorable as it was the first Renaissance study on proportions applied to “ship design.” Alberti stated that “in ship design, ancient

---

them to floating barrels. While ingenious, this method proved unsuccessful because of extensive rotting of the ships. The instruments and machines Alberti used for the failed recovery of Caligula’s ships are the same as those depicted in the *Hypnerotomachia Poliphili* (1499), whose author has now been identified as Alberti by Lefaivre (1997). Alberti’s interest for ships is also documented by the many drawings depicting an anchor and a dolphin symbolizing the Roman motto *festina lente*, “hasten slowly.” This depiction first appeared in 1499, in the *editio princeps* of the *Hypnerotomachia Poliphili*, and, again in 1501; two years later, the Venetian printer Aldo Manuzio adopted it as his printing emblem. See Lefaivre 1997, 8-43; Godwin, 1999, 69.

<sup>365</sup> Richter and Pedretti 1977, 256; Mancini 1882, 280-1. Richard Barker (2007, 41), however, argued that Leonardo might not have seen the original *Liber navis*, but rather derived his knowledge of the manuscript from Alberti’s *De re aedificatoria*.

<sup>366</sup> Giraldi 1540, 3. 15: *Libello Leonis Alberti Florentini, qui Navis inscribitur*.

<sup>367</sup> Such as Leonardo da Vinci, Gregorio Giraldo, Jacopo Frisio, and Bernardino Baldi. See Mariani 1941, 12, and Pedretti 2007, 125.

<sup>368</sup> Alberti, *De re aed.* 5.12: *Alibi de navium rationibus in eo libello, qui navis inscribitur, profusius prosecute sumus*; Bonelli and Portoghesi 1966, 389.

<sup>369</sup> Alberti, *De re aed.* 5.12: *Onerariae longitudo velim ad latitudinem sit ne minus tripla, fugacis ne plus nonupla*; Bonelli and Portoghesi 1966, 389.

<sup>370</sup> Alberti, *De re aed.* 5.12: *Arbori atque navi aequa dabitur longitudo*.

architects were inspired by shapes of fish, so that the body corresponded to the hull, the head to the bow, the tail to the stern-rudder, the gills and the fins to the oars.<sup>371</sup> This zoomorphic principle was a great intuition that affected naval architecture even in the following centuries. This concept can be seen in Matthew Baker's *Fragments of Ancient English Shipwrightry* (1570s), where he depicted the hull of a ship mirrored as that of a fish, and in the naval treatise *Nautica mediterranea* (1601) by Bartolomeo Crescenzo.<sup>372</sup> The zoomorphic principle underlying the shape of the ship's hull derived from the mythical *Argo*; in ancient Greek culture, *Argo* represented the first ship ever built and was modeled according to the shape of the fish *pristis*.<sup>373</sup>

The significance of Alberti's *Liber navis* and its influence on Fausto's work can be fully appreciated in a passage from *De re aedificatoria*, where Alberti wrote that *haec nostra ratio*, the principle employed in naval architecture, "can be decisive in the victory and safety of the crew."<sup>374</sup> He stated that the construction of a ship had to be based on *lineamenta*, the ship's design.<sup>375</sup> According to Alberti, the dangers of navigation not only come from the force of winds and waves but, most of all, from faults in the design of the ship (*vitia liniamenta*).<sup>376</sup>

---

<sup>371</sup> Alberti, *De re aed.* 5.12: *Fabricandis navibus lineamenta veteres arhitecti sumpere a piscibus, ut quod in illo dorsum, in hac fit carina, quod illi caput, huic prora; tum et pro cauda temon, etpro remis brancae et aliculae.* In: Bonelli and Portoghesi 1966, 389.

<sup>372</sup> Crescenzo 1601, 9; Gibbs Smith 1978, 34. Also, Cristoforo da Canal, in his *Della milizia marittima*, compares the frames fastened to the keel to fish spines; Nani Mocenigo 1939, 64.

<sup>373</sup> Baif 1537, 32. For a description of the fish *pristis*, see Plin. *HN* 9.8; for the *Pristis*, one of Aeneas's ships, see Verg. *Aen.* 5.116; for the type of ship called *pristis*, see Nonius Marcellus 13.134.

<sup>374</sup> Alberti *De re aed.* 5.12: *Haec nostra ratio et ars aedificatoria classiariis ducibus et turmis salutem pariat;* Bonelli and Portoghesi 1966, 387.

<sup>375</sup> Alberti *De re aed.* 5.12., Bonelli and Portoghesi 1966, 389.

<sup>376</sup> *Supra* n. 374.



The Vitruvian concepts of *ratio* and *modulus* – from which derives the English word “mold” – are fundamental in ship design. Both Marcus Vitruvius Pollio and Leon Battista Alberti paved the way for the field of *marina architectura*.

### **From the *Fabrilis Peritia* to the *Architecturae Professio***

The establishment of a new shipbuilding principle based on fixed proportions led to a complete separation between the shipwrights, who built the ships with their hands, and the naval architect, who designed and supervised the project.<sup>377</sup> When the Venetian Senate saw Fausto’s quinquereme design that he had drawn according to ancient proportions, they asked the *prothi*, the Venetian shipwrights, to evaluate Fausto’s project. After examining the design, raising many questions, and expressing doubts, the *prothi* finally admitted that they were unable to build a galley with such a complicated arrangement of oars.<sup>378</sup> Consequently, Vettor Fausto himself had to build his quinquereme in the Arsenal, and thus, a new type of shipbuilder was born: the *architectus navalis*.

Fausto was so influenced by the revival of Latin and Greek texts that he joined the *Filellenes*. The *Filellenes*, as the word itself suggests, were scholars devoted to spreading Classical culture by exchanging Greek and Latin written sources with each other.<sup>379</sup> It was in this lively cultural atmosphere that Fausto conceived his *marina architectura* based on the expertise and knowledge of the *architectus navalis*.

---

<sup>377</sup> Concina 1990, 71-99; Bash 1998, 34; Hocker and McManamon 2006: 16.

<sup>378</sup> Sanuto, XLII, col. 765 and 766.

<sup>379</sup> Ross 1976, 521-44; Lepori 1976, 4: 539-605; Logan 1980, 104-5.

Vitruvius in his *De architectura* wrote that the architect's service depends upon *fabrica et ratiocinatione*, that is to say, upon the craftsmanship and upon principles based on calculations.<sup>380</sup> Isidore of Seville (C.E. 560-636), in the 19<sup>th</sup> book of his *Etymologiarum liber*, combined naval architecture with terrestrial architecture. He made a distinction between the *architectus* who supervises the project (*dispositio*), and the *faber* who is responsible for the construction (*constructio*).<sup>381</sup> In the *Politicus* of Plato, the Younger Socrates said that the ἀρχιτέκτων (*architektōn*), “the architect,” is not αὐτὸς ἐργατικὸς (*autos ergatikos*), “a workman himself,” but rather a ruler of workmen, ἐργατῶν ἄρχων (*ergatōn archōn*). “Παρεχόμενος γέ που γνῶσιν ἀλλ’ οὐ χειρουργίαν” (*Parechomenos ghe pou gnōsin all’ou cheirourghian*) – noted the Eleatic Stranger – “Because [the architect] supplies knowledge, not manual labour.”<sup>382</sup> Centuries after Plato, Alberti stated that “...the hand of the carpenter is a tool to the architect”.<sup>383</sup> In the *prohemium* of the *De re aedificatoria*, Alberti was the first during the Renaissance to assign ship design to the skill and knowledge of a naval architect.<sup>384</sup>

Fausto spent many years visiting various Mediterranean shipyards in search of shipbuilding experience and he talked with shipwrights of many nations, including Catalans, Normans, Basques, and Genoese. In 1540 he stated, “I developed my method by myself with great effort, traveling all around the world wherever I heard there was a

<sup>380</sup> Vitr. *De arch.* 1.1.1 : *Opera ea nascitur et fabrica et ratiocinatione.*

<sup>381</sup> Isid. *Etym.* 19.9 and 19.8: *Fabros autem sive artifices Graeci vocant, id est instructores. Architecti autem cementarii sunt, qui disponunt in fundamenta.* See also Forcellini 1860, 1: 367 *sub vocem* “Architectus”: *Architectus differt a fabro, quod faber solam partem in construendo operam manuariam, architectus praeterea consilium et dispositionem totius operas.*

<sup>382</sup> Pl. *Plt.* 259e. See also Arist. *Metaph.*, 981b 30. For ἀρχιτέκτων in shipbuilding, see Arist. *Ath. Pol.* 46.1.

<sup>383</sup> Alberti *De re aed.*, *prohemium* (introduction): *fabri enim manus architecto instrumento est;* Bonelli and Portoghesi 1966, 2.

<sup>384</sup> Alberti also recalls the *veteres architecti*, the ancient Roman architects.

skilled shipwright able to teach me good techniques, apart from the knowledge of the ancient written sources, which I have interpreted as none have before [me].”<sup>385</sup> Fausto combined *ars* and *scientia*, ἐπιστήμη πρακτική (*epistēmē praktikē*) and ἐπιστήμη γνωστική (*epistēmē gnōstikē*), the practical art and the intellectual science, as Plato noted.<sup>386</sup> Indeed, “marine architecture” was a *scientia*, since it originated from a theoretical knowledge based on *litterae et disciplinae*, but the outsider Fausto also applied his shipbuilding knowledge to building his *quinqueremis* in the Venetian Arsenal.

Vitruvius noted that science (*scientia*) of the architect depends on many disciplines (*disciplines*) and various knowledges that are performed in other arts (*artibus*).<sup>387</sup> In describing the perfect architect, Vitruvius wrote, “he should be a man of letters, a skilful draughtsman, should have some knowledge of geometry, should be familiar with historical studies, and should listen diligently to philosophers,[should be] acquainted with music, [and] not ignorant of medicine”.<sup>388</sup>

In order to better understand the Classical atmosphere surrounding Fausto, it has to be said that Lazaire de Baïf, the French ambassador in Venice and a *Filhellènes*, wrote a compendium titled *De re navali* (1537), in which he gathered all the Latin and Greek

---

<sup>385</sup> ASV, Consiglio di Dieci, Parti secrete, reg. 1, fol. 62r.

<sup>386</sup> Pl. *Plt.* 258d.

<sup>387</sup> Vitr. *De arch.* 1.1.1. *Architecti est scientia pluribus disciplinis et variis eruditionibus ornata quae ab ceteris artibus perficiuntur.* For a discussion, see Granger 1925, 67-9.

<sup>388</sup> Vitr. *De arch.* 1.1.3: *Et litteratus sit, peritos graphidos, eruditus geometria, historias complures noverit, philosophos diligenter audierit, musicam scierit, medicinae non sit ignarus.* For the architectural profession in antiquity, see Clarke 1963, 9-22.

written sources available at that time concerning naval architecture.<sup>389</sup> In the chapter titled *Verba navibus propria*, “Verbs referring to ships”, he recorded certain Latin passages in which the verbs *aedificare*, *construere*, *facere*, *fundare* and *fabricare* are mentioned in relation to ships. In addition to the passages from Ovid,<sup>390</sup> Cicero,<sup>391</sup> and Columella,<sup>392</sup> the most significant source mentioned by Baïf is a passage from Plautus’ *Miles gloriosus*. The courtesan Acroteleutium compared the planning of the intrigue against the braggart warrior to the building of a ship. She said to the old gentleman Periplectomenus:

When the architect is skilful, if he has once laid down the keel exact to its lines, [then] building a ship is easy, once [the keel] it is laid and placed. Now, this keel of ours has been skillfully laid and firmly placed, and the carpenters helping the architect are not unskilled in this business. If we are not delayed by the raw material [*i.e.*, the timbers] that is needed – I know the adroitness of our ingenuity, soon will [our] ship will be got ready.<sup>393</sup>

In *De re navali* there are many other passages recorded dealing with ancient ships an, in particular, with *quinqueremes*. In his chapter devoted to the *naves longae*, “long galleys,” Baïf mentioned Aristophanes,<sup>394</sup> Thucydides,<sup>395</sup> Diodorus Siculus,<sup>396</sup>

---

<sup>389</sup> Lazaire de Baïf (1537), *De re navali libellus in adolescentulorum bonarum literarum studiorum favore*. Parisiis: APud Franciscum Stephanum.

<sup>390</sup> Ov. *Her.* 16.107-18.

<sup>391</sup> Cic. *Leg. Man.*, 4.9, *Sen.* 20.72, *Verr.* 1.3.

<sup>392</sup> Colum. *Rust.* 1.4.

<sup>393</sup> Plaut. *Mil.* 915-21: *Ubi probus est architectus, bene lineatam si semel carinam conlocavit, facile essere navem facere, ubi fundata, constitutast, nunc haec carina satis probe fundata, bene statutast, atque architecto adsunt fabri ad eam rem haud non imperiti. Si non nos materiarius remoratur, quod opus det (novi indolem nostri ingeni), cito erit parata navis.* Translation mine. See Pomey (1973, 483-515) who discussed the passage along with Ov. *Her.* 16.107-18.

<sup>394</sup> Ar. *Ra.* 1074.

<sup>395</sup> Thuc. 2.93.2.

<sup>396</sup> D. S. 14.44.6.

Herodotus,<sup>397</sup> Pollux,<sup>398</sup> and Vegetius,<sup>399</sup> all ancient authors that Fausto read and knew extremely well. Yet, is it possible to identify more specifically the Greek and Latin texts Fausto referred to in drawing his *ratio*, the proportions applied in building his galley?

The passage from Vitruvius's *De architectura* describing a ship's *modulus*, that is the space between the tholes, should have been the starting point in Fausto's design. Obviously, this fundamental prescription, although stated by a most influential architect such as Vitruvius, was not sufficient for building an entire ship. Another ancient source on which Fausto based his galley's design may have been the *Historiae* by Polybius. In describing the Battle of Ecnomus (256 B.C.E.) between Romans and Carthaginians, the Greek historian recorded that 300 Romans were on board each πεντήρης (*pentērēs*), that is to say quinquereme. The exact configuration of the Roman quinquereme is not known, although scholars argue that the quinquereme or "five" evolved from the ancient trireme and was a three-level vessel with two rowers per oar on the two upper levels and one rower with his oar on the lower level.<sup>400</sup> The figure of 300 Romans, including officers and sailors, indicates there must have been less than 30 benches per level on either side, or less than 90 benches total on either side.<sup>401</sup>

Fausto built his galley with 28 benches per side. The Venetian historian Sanuto, who was present at the launching of Fausto's *quinqueremis*, recorded in his *I Diari* that

---

<sup>397</sup> Hdt. 3.39.3; 3.44.2; 6.8.

<sup>398</sup> Poll. *Onom.* 1.87 and 1.120.

<sup>399</sup> Veg. *Mil.* 4.34.

<sup>400</sup> Casson 1971, 101-2. Casson's assumption is based on the fact that the quinquereme and the trireme had roughly the same maximum breadth and were stored in the same boathouses. See also Morrison 1996, 296.

<sup>401</sup> Walbank, 86.

he saw the oarsmen “rowing together in harmony.”<sup>402</sup> Yet, Fausto stated that he built his galley according to the proportions found “in the most ancient Greek manuscripts”, most of which have yet to be identified.

The only known source thus far that Fausto presumably used in building his *quinqueremis* is the Pseudo-Aristotelian “Mechanics” because in 1517 Fausto published a Latin version of the original Greek work.<sup>403</sup> Fausto’s interest in the Greek philosopher Aristotle led him to join the *Studio Padovano*, the University of Padua, which was one of the most important centers of learning in Italy – perhaps the most important in Europe – in terms of scholarly study for the Latin tradition of interpreting Aristotle.<sup>404</sup> Applying Aristotle’s Fifth Question about the movement of bodies to ship construction design, Fausto was able to calculate the steering performance of the stern rudder. The application of Aristotle’s Fifth Question involves the principle of levers.<sup>405</sup>

To determine the oars arrangement, Fausto might have studied *The Conics* by the Apollonius of Perga (ca. 262-190 B.C.E.), a Greek mathematician who studied Euclidean geometry.<sup>406</sup> A document from the Archive of Venice (Archivio Proprio Contarini) throws light on ancient sources that might have been used, since it reported that “Fausto was a very eminent scholar, and whenever he shaped some timber, he

---

<sup>402</sup> Sanuto, L, col. 343.

<sup>403</sup> Drachmann 1963, 13-8; Tarn 1985,137-40.

<sup>404</sup> Maccagni, 1980, 3: 135-7; Schmitt 1984, 104-23.

<sup>405</sup> Page 1939, 430.

<sup>406</sup> Heath 1896, 11. For a brief discussion of the theorem, see Archibald 1916, 159-61. Clagett (1964) discusses how the works of Apollonius and Euclid are related to each other.

always used the compass [...] He drew his (shipbuilding) principle from Euclid, who is the guide to each mechanical operation.”<sup>407</sup>

Therefore, one of the “ancient Greek manuscripts” consulted by Fausto must have been Euclid’s *Data*, which was the fundamental study of geometry in establishing the basis of Greek mathematics.<sup>408</sup> The manuscript depicts graphically the proportions employed by Fausto in building a great galley (*galea grossa*). The large circumference corresponds to the length of the galley (fig. 1). The diameter of the inscribed circle, which is equal to the radius of the larger circle, corresponds to the *bocca*, or the ship’s maximum breadth. Thus, the ship’s length-to-beam ratio is 1:6.

---

<sup>407</sup> ASVe, Archivio Proprio Contarini, env. 25, folio not numbered (former ASVe, Provveditori all’Arsenale, env. 1, fol. 11r). This manuscript was first mentioned by Tucci (1964, 281), who also provided a transcription of it. I thank Mauro Bondioli for providing me with both Tucci’s article and the manuscript from the Archivio Proprio Contarini. Euclidean geometry was revived through the work of Fra’ Luca Pacioli, who, in 1494, published in Venice the *Summa de arithmetica, geometria, proportioni et proportionalità* (“On Arithmetic, Geometry, Proportions and Proportionality”). It should be noted, however, that in Venice there were many *abbaco* schools that taught basic mathematics and geometry, see Gamba and Montebelli 1987, 169-202. That Euclid became the authority in Renaissance mathematics is also stated by Giuseppe Moletto (the first professor of mathematics in Venice, 1531-1538) in his *Rudimenta quaedam pro mathematicis disciplinis* (“Elementary Mathematics”), which was published in Venice in 1578. Two years earlier, Moletto published the “Dialogue on Mechanics,” mostly based on the Latin translations of the “Mechanics” by Fausto (1517) and Leonico (1525); in Carugo 1984, 183; Laird 1987, 213-27.

<sup>408</sup> Taisbak 2003. For the transmission of Euclid’s *Data* during the Medieval Age, see Ito 1980.

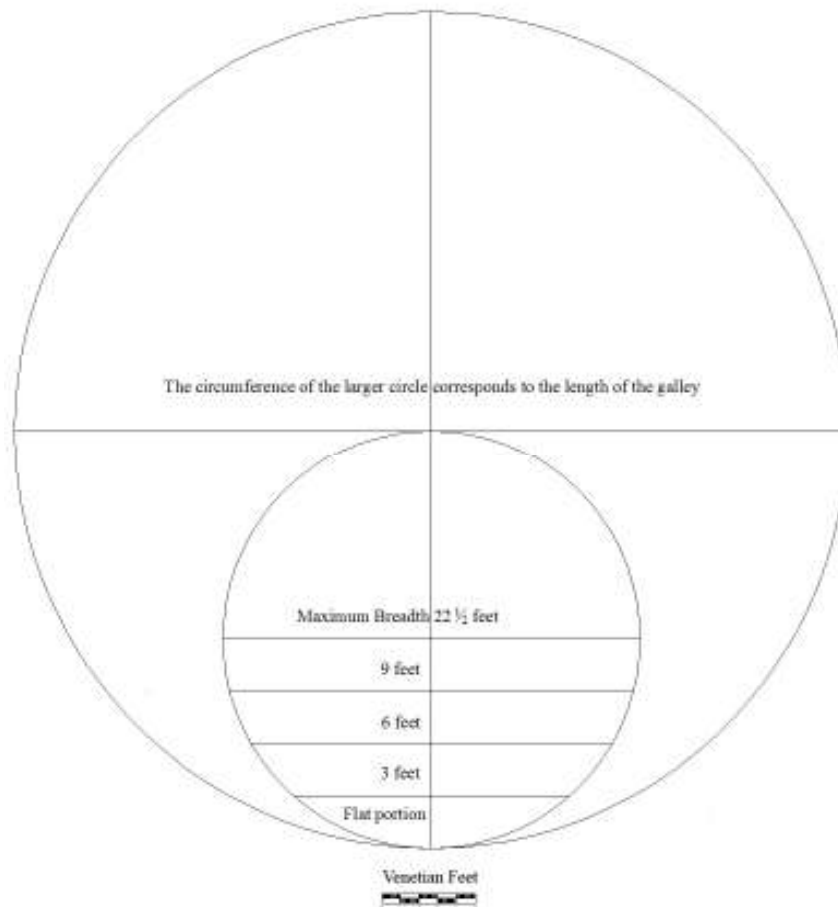


Fig. 1. Geometrical drawing illustrating the proportions of Fausto's great galley.  
Drawing: L. Campana.

No one in the Arsenal, after Fausto, was able to build a galley according to Greek and Roman proportions; the *marina architectura* was born, lived and died with Fausto. Remarkably, the quinquereme survived his creator. Fausto stimulated later studies on naval architecture, such as those of Alessandro Picheroni della Mirandola, whose “Drawings of Biremes, Triremes, and Quadriremes” can be regarded as the first technical naval drawings *strictu sensu* in the European Renaissance.<sup>409</sup> The Italian

<sup>409</sup> BNM, Ms. It., cod. 379 (=7588).



architect Antonio da Sangallo the Younger (1484-1546) was also interested in Fausto's quinquereme and in particular in its rowing arrangement, for he left a drawing of it.<sup>410</sup> The humanist Francesco Robortello (1516-1567), in his edition of Aelianus, published two illustrations depicting a side and a top view of the quinquereme. The fame of the quinquereme quickly spread to the East and during the 16<sup>th</sup> century this type of vessel was incorporated into the Ottoman fleet. A dispatch sent from Constantinople to the Venetian Senate by the *bailo* Giacomo Soranzo, on 22 May 1568, recorded "the Captain's galley is a quinquereme with 29 benches, manned by five men pulling a single oar, and Piali Bassà [Piyale Pasha, ca. 1515-1578], gave to the Captain three lanterns as gifts, as well as banners, and all the necessities that were prepared for the Captain, for he had armed and outfitted his ship in an excellent way, decorated the stern, and embellished the sides with gold-embroidered cloth."<sup>411</sup> Just three years later, at the eve of the Battle of Lepanto (7 October 1571), the Pope requested that Venice build a quinquereme to serve as the flagship of the Papal fleet. Marco Antonio Colonna was chosen as Sea Captain and Admiral of the quinquereme.<sup>412</sup> The Ottoman Navy, however, never faced the Venetian quinquereme for while heading toward Lepanto, it was struck by lightning in a fierce storm and sank off the coast of Ragusa.<sup>413</sup>

---

<sup>410</sup> Frommel 1994, 391.

<sup>411</sup> ASVe, Senato, Dispacci, Costantinopoli, string 3, folio not numbered, dispatch dated to 22 May 1568: *La galea Capitana è quinquereme de banchi 29, et li cinque homini per banco vogano un remo solo, et Piali Bassà ha donato al Capitano li soi tre fanò, le bandiere e tutte le altre provisioni che li havevano preparato per sè, et del resto egli l'ha messa benissimo ad ordine et fra le altre cose ha fatto coprìr la pupa et le bande di pano d'oro.*

<sup>412</sup> Guglielmotti 1862, 25.

<sup>413</sup> *Supra*, n. 25.

## CHAPTER IV

### THE QUINQUEREME

#### **Introduction**

This chapter discusses passages from Classical works mentioning the quinquereme and investigates the theoretical knowledge involved in its construction. The technical design aspects of the quinquereme's hull will be examined in the following chapter.

Particular emphasis is given to the passages from the "Mechanics" by Aristotle containing observations on the oar and steering mechanism. The "Mechanics" by Aristotle was a formative text for Fausto in the conception of the quinquereme. Aristotelianism was widely spread in Venice as a result of the firm opposition against Averroism, whose medieval interpretations of Aristotle did not conform the Renaissance world.<sup>414</sup> In Venice, the philosophical theories of Aristotle circulated among the humanist circle of Ermolao Barbaro (1453-1493), and were largely studied at the University of Padua.<sup>415</sup> However, both the University of Padua and the humanists gathered around Barbaro focused primarily on the study of the Aristotelian writings concerning natural philosophy and natural sciences, whereas minor works, such as the "Mechanics," were disregarded. In Barbaro's ambitious project to publish the *opera omnia* of Aristotle with the Aldine press, the "Mechanics" was not included.<sup>416</sup> Thus,

---

<sup>414</sup> Russell 1945, 57-61.

<sup>415</sup> Nardi 1958; Branca 1980, 3: 124-75.

<sup>416</sup> Branca 1980, 3: 156.

Fausto's *Aristotelis Mechanica* published in Paris in 1517 was the first Latin translation that was produced in the Western world.<sup>417</sup>

As discussed previously, a copy of this Greek text might have been acquired by Fausto during his visit to the University of Alcalà, which was the major center in Spain for the study of Aristotelian works. Fausto dedicated his *Aristotelis Mechanica* to his friend and patron Giovanni Badoer, with whom he went to France as a member of the Venetian envoy when Badoer was elected ambassador.<sup>418</sup> Fausto, upon his return to Venice, applied the knowledge and the mechanical principles of Aristotle's "Mechanics" to the building of the quinquereme. As discussed in the previous chapter, however, Fausto based the construction of his vessel also on other ancient authors, among whom Euclid held a prominent role. Other than the relationships that Fausto established with Spanish and French scholars, and the friendship with Giovanni Badoer, another person who may have played an important role in the project of building the quinquereme was the Venetian Pietro Bembo.

Bembo studied at Messina in 1492-1494, and his interest in mathematics was documented through his friendships with many mathematicians and scientists with whom he had intense correspondence.<sup>419</sup> Among them was Niccolò Leonico Tomeo, professor of philosophy at the University of Padua who, right after Fausto's translation, published another Latin translation of the "Mechanics" in 1525. Others included

---

<sup>417</sup> BNM, 2983: *Aristotelis Mechanica Victoris Fausti industria in pristinum habitum restituta ac latinitate donata, in aedibus Iodoci Badii* (1517).

<sup>418</sup> Giovanni Badoer had also been the patron of Giorgio Valla, a professor of humanities at the School of Saint Mark (1492-1500). In 1498 Valla dedicated to Badoer a translation of several mathematical Greek texts; see Rose 1976, 299-310.

<sup>419</sup> See Bembo's letters addressed to the most famous Italian and European humanists published by Ernesto Travi (1992). See also Cian 1885, 139-154; Spezi 1862, 79-94; Mazzacurati 1980, 3: 1-58.

Giambattista Memmo, the first public professor of mathematics in Venice, and the Sicilian mathematician Maurolico.<sup>420</sup>

When Pietro Bembo became librarian of the Marciana Library in 1530, he spent all his energy and time in the recovery of Euclid's "Elements." It was part of the splendid collection of mathematical manuscripts left in legacy to Venice, as a "second Byzantium," in 1468 by the Cardinal Bessarion.<sup>421</sup> A Latin translation of the Greek text of the "Elements" had circulated since 1505, when the Venetian humanist Benedetto Zamberti published it in Venice with the printer Tacuino.<sup>422</sup>

Also included in our discussion here are accounts and naval treatises written by 16<sup>th</sup>- and 17<sup>th</sup>-century humanists and sea captains describing Fausto's quinquereme. These literary sources provide a rare insight to the features of this new type of vessel.

### **Rowing Arrangement, Rowing System, and Steering Mechanism**

In his encyclopedic work titled *Naturalis historia* ("Natural History"), Pliny the Elder (C.E. 23-79) asserted that "according to Mnesigiton, the quinquereme was invented by the Salaminians."<sup>423</sup> In this regard, Mnesigiton, or Nasichtone, is not the

---

<sup>420</sup> Rose 1975, 11. Niccolò Leonico Tomeo gave courses on Aristotle at Padua (Balsamo 2002, 179).

<sup>421</sup> Castellani 1895, 891. Bembo worked as a librarian in the Marciana Library until 1543.

<sup>422</sup> Zamberti 1505: *Euclidis Megaresis philosophi platonici mathematicarum disciplinarum janitoris. Venetiis: in aedibus Ioannis Tacuino*. It is unknown which Greek manuscript Zamberti used for his Latin translation. A revised version of Zamberti's translation was made by Fra' Luca Pacioli in Venice in 1509. A Latin translation of the "Elements" from the Greek text, however, was available since the 12<sup>th</sup> century in Southern Italy, but it had minimal circulation and little recognition. On Euclidean study during the Renaissance and various Latin translations that followed after that of Zamberti, see Folkerts 2003 and 2006. Also in the 12<sup>th</sup> century, Abelard of Bath made a translation of the "Elements" from the Arabic version, which soon became widespread; see Clagett 1953, 16-42; Drake et al. 1999, 3: 65-70; and especially, the recent article published by Sonja Brentjes (2008, 442-63) who discusses the circulation of the Arabic version of Euclid in Renaissance Europe.

<sup>423</sup> Plin. *HN* 7.57: *Quinqueremem Mnesigiton Salaminios*.

inventor of the quinquereme, but “a quite unknown writer” who provided the information about the inventors (the Salaminians) of the quinquereme, as had already been noted by the eminent classicist Tarn.<sup>424</sup> The sea captain Pantero Pantera and even the celebrated humanist Pietro Bembo ascribed the invention of the quinquereme to Mnesigiton, but the original Latin text proves this information to be incorrect.<sup>425</sup> Aside from this clarification, it is important to note that Pietro Bembo praised “...the recovering of the quinquereme that has been invented by Fausto, who is like Nasichtone of Salamis in ancient times.”<sup>426</sup>

Fausto claimed before the Venetian Senators that he wanted to recreate the quinquereme “...that was used by the Romans during their wars.”<sup>427</sup> This is quite an audacious statement if one considers that there were, obviously, substantial differences between the ancient quinquereme and the ship proposed by Fausto. The quinquereme was the warship most extensively used by the Romans, Carthaginians, and Hellenistic major naval forces who were contesting for dominion over the Mediterranean, a contest which was eventually decided in Rome’s favor.

According to the Greek historian Diodorus Siculus (first century B.C.E.), the πεντήρης (pentērēs), or quinquereme, was invented by Dionysus I of Syracuse around 399 B.C.E., when the Carthaginians threatened his kingdom in Sicily. Dionysus planned to wage war against the Carthaginians. Therefore, he “...accordingly began at once to

---

<sup>424</sup> Tarn 1939, 128. Mnesigiton probably lived in the fourth century B.C.E.

<sup>425</sup> This error had been reiterated also by Concina (1990, 74).

<sup>426</sup> Bembo, letter n. 975, addressed to Giovan Battista Ramusio (29 May 1529); in Travi 1992, 47.

<sup>427</sup> Coates (1995, 138) suggested that the quinquereme of the Romans was 45 meters long overall, slightly shorter than the quinquereme designed by Fausto. For the Roman quinquereme, see Tarn 1930, 130-1; Morrison 1995, 68-9 and 1996, 270-1.

assemble by decree craftsmen from the cities under his control, and attracted them with high wages from Italy, and even from the territory controlled by the Carthaginians. He had in mind to manufacture a great quantity of arms and missiles of all kinds, and, moreover, also triremes and quinqueremes, although a ship of the latter oar system had at that time not yet been built.”<sup>428</sup> That Dionysus was the inventor of the quinquereme is asserted a second time by Diodorus, when he recalls that the tyrant “...began constructing the quadriremes and quinqueremes, being the first to think about the construction of such ships.”<sup>429</sup>

According to the Greek historian Polybius (200-118 B.C.E.), in 261 B.C. E., during the First Punic War (264-241 B.C.E.), the Romans modeled their quinquereme on one of the Carthaginian quinqueremes that they had captured off the coast of Messene (Messina, Sicily). Polybius thus narrated the episode:

When they saw that the war was dragging on, the Romans undertook for the first time to build ships, a hundred quinqueremes and twenty triremes. As their shipwrights were absolutely inexperienced in building quinqueremes, such ships never having been in use in Italy, the matter caused them much difficulty [...] It was not that they had fairly good resources for it, but they had none whatsoever, nor had they ever given a thought to the sea; yet when they once had conceived the project, they took it in hand so boldly, that before gaining any experience in the matter they at once engaged the Carthaginians who had held for generations undisputed command of the sea [...] When the Romans first undertook to send their forces across to Messene not only had they not any decked ships, but no long warships at all, not even a single vessel, and borrowing fifty-oared boats and triremes from the Tarantines and Locrians, and also from the people of Elea and Naples, they took troops across

---

<sup>428</sup> D. S. 14.41.3.

<sup>429</sup> D. S. 14.42.2. Based on the authority of Aristotle, Pliny wrote that the quadrireme was invented by Carthaginians.

the sea in these at great hazard. On this occasion the Carthaginians put to sea to attack them as they were crossing the straits, and one of their decked ships advanced too far in its eagerness to overtake them and running aground fell into the hand of the Romans. This ship they now used as a model, and built their whole fleet on its pattern; so it is evident that if this had not occurred, they would have been entirely prevented from carrying out their design by lack of practical knowledge.<sup>430</sup>

The sea captain Pantero Pantera in his *L'armata navale* ("The Navy") echoed the words of Polybius, and recalled the success of the Roman quinquereme against the enemy fleet:

This type of vessel (the quinquereme), as asserted by Polybius, was the core of the first fleet that have been built by the Romans. They built one hundred quinqueremes, and these were the first ever built in Italy. The model of the quinquereme came from a Carthaginian quinquereme that was captured by the Romans after it broke in the Strait of Messina. During the First Punic War, which lasted twenty-four consecutive years, one day [the Roman and the Carthaginians] engaged in naval battle with more than five hundred quinquereme on both sides. Another time, they fought with about seven hundred. During the Second Punic War, the Romans extensively used the quinquereme, more than any other type of vessels; they used it also against Philip, Antioch, and Perseus. Caesar used it during the Civil Wars, as well as did Pompeus and Mark Anthony.<sup>431</sup>

---

<sup>430</sup> Plb. 1.20.8-16.

<sup>431</sup> Pantero, 1614, 19: *Di questa sorte di vascelli (come dice Polibio) fu la prima armata che facessero i Romani, havendo fatto fabricare cento quinqueremi, le quali furono le prime che si mettersero in mare in Italia, et ne fu preso il modello da una quinquereme de i Cartaginesi, la quale, essendosi rotta nel Faro di Messina, venne in poter dei Romani. Della quinquereme, più che d'ogn'altra sorte di vani lunghe, si servirono sempre i Romani contra i Cartaginesi, et i Cartaginesi contra i Romani. Et nella prima guerra Punica, che durò ventiquattr'anni continui, fu combattuto una volta tra le altre con più di cinquecento quinqueremi dall'una, et dall'altra parte, et un'altra volta con poco meno di settecento. Le usarono anco i Romani più dell'altre sorti di navi bella seconda guerra Punica, et contra Filippo, et contra Antioco, et contra Perseo, et nelle guerre civili se ne servirono Cesare, et Pompeo, et Marco Antonio.*

Polybius recounted that during the Battle of Ecnomus (256 B.C.E.) the crew of the Roman quinquereme that fought against the Carthaginians totaled “three hundred rowers and a hundred and twenty marines.”<sup>432</sup> The ancient quinquereme could have evolved either from the trireme or from the bireme. In the rowing arrangement based on the trireme, the quinquereme would have had two rowers sitting on the first two levels, and one rower on the lowest. Whereas in the rowing arrangement based on the bireme there would have been three rowers on the upper level and two on the lower. Morrison and Casson, however, tend to believe that the rowing arrangement of the quinquereme evolved from the trireme and therefore, the three hundred rowers mentioned by Polybius would have been positioned in the following way: two rowers on the upper two levels, and one at the lowest level, thus having 30 benches per level, and a total of 90 benches per side.<sup>433</sup> However, the Ragusan Benedetto Cotrugli (1416-1469), in his *De navigatione* written in 1464/65, asserted that multi-oared vessels like the hexeres (six-er) and the hepteres (seven-er) “have six and seven oars respectively, but they are arranged in superimposed levels, one above and the other below, and thus they are three and three, and four and three.”<sup>434</sup> Cotrugli, citing a passage from “The Life of Demetrius” by Plutarch, said that the forty-er that Demetrius built could not have been with forty levels, but arranged on five different levels.

During the Renaissance, it was not clear how multi-oared vessels would have appeared, and some incredible rower configurations and vessel shapes have been

---

<sup>432</sup> Plb. 1.26.7.

<sup>433</sup> Morrison 1995, 69; Casson 1971, 101-2. See also Polybius 1.21.1-2 about the training of rowers.

<sup>434</sup> Cotrugli 1464/65, fol. 25b: *Et quisti sei remi per banco o vero VII devite intendere cge li uni vogavano per ordene desopra, gli altri desotto, tri e tri o vero quarto e tri*. The transcription of the *De navigatione* has been recently published by Salopek (2005). The passage is from page 100.



proposed. Thus, the illustration of the Roman quinquereme that accompanied Scheffer's *De militia navali veterum* ("On the Ancient Navy," 1654) showing five superimposed levels of rowers (fig. 2), could never have been realized. The nearly contemporaneous *De fabrica triremium liber* ("On the construction of Triremes") by Meibom (1671) depicts the same configurations with five superimposed levels of rowers (fig. 3). In the words of Pantera Pantero "The quinquereme was a long ship, longer than the above mentioned [triremes, that is, light galleys]. It has been called 'quinquereme' because it was rowed by five men on each bench."<sup>435</sup>

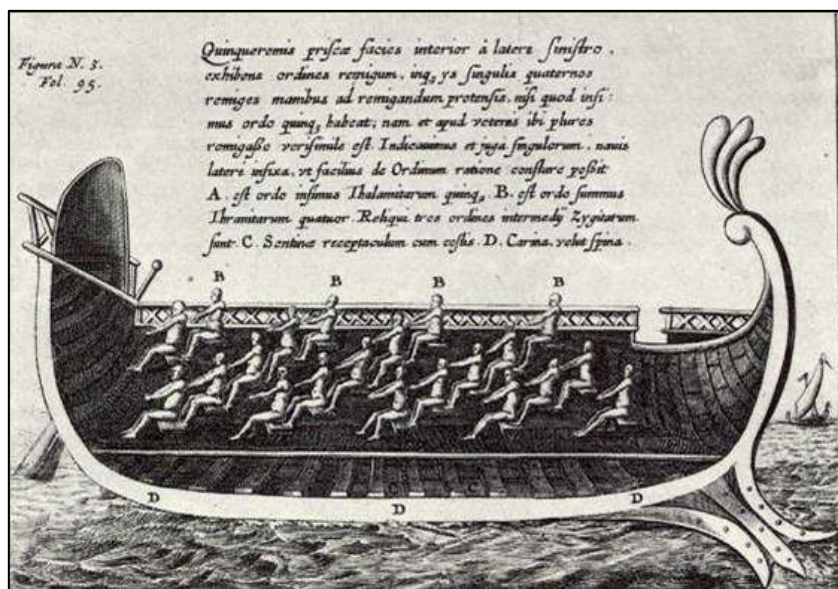


Fig. 2. Quinquereme from Scheffer's *De militia navali veterum*, 1654. After: Concina 1990, fig. 106 (page not numbered).

<sup>435</sup> Pantera, 1614, 19: *Di questa sorte di vascelli (come dice Polibio) fu la prima armata che facessero i Romani, havendo fatto fabricare cento quinqueremi, le quali furono le prime che si mettesse in mare in Italia, et ne fu preso il modello da una quinquereme de i Cartaginesi, la quale, essendosi rotta nel Faro di Messina, venne in poter dei Romani. Della quinquereme, più che d'ogn'altra sorte di navi lunghe, si servirono sempre i Romani contra i Cartaginesi, et i Cartaginesi contra i Romani. Et nella prima guerra Punica, che durò ventiquattr'anni continui, fu combattuto una volta tra le altre con più di cinquecento quinqueremi dall'una, et dall'altra parte, et un'altra volta con poco meno di settecento. Le usarono anco i Romani più dell'altre sorti di navi bella seconda guerra Punica, et contra Filippo, et contra Antioco, et contra Perseo, et nelle guerre civili se ne servirono Cesare, et Pompeo, et Marco Antonio.*



Fig. 3. Quinquereme from Meibom's *De fabrica triremium liber*, 1671.  
After: Concina 1990, fig. 108 (page not numbered).

Judging from the available literary sources, the construction of Fausto's quinquereme fueled the debate generated around the rowing system of this vessel in ancient times. The French humanist Lazaire de Baïf (1496-1547), who lived in Venice as ambassador to France and who was a friend of Fausto, wrote in his *De re navali* (1537) that "the quinquereme, in ancient times, had forty benches on either side, and it had a total of four hundred rowers."<sup>436</sup> Pantero Pantera, who investigated the number of benches of the Roman quinquereme disagreed with Baïf and provided much information about Fausto's ship:

<sup>436</sup> Baïf 1537, 34: *Quadräginta fuisse sedilia in tabulato alterius lateris quinqueremis, quae quidem quadringentis remigibus agebatur.*

Since [the quinquereme] has been extensively used and highly praised both by the Carthaginians, who had been the lords of the sea, and by Romans, who had been the emperors of the world, I would like to investigate its original shape and what they had in common with [our] galleys used today. Lazair de Baïf, in his *De re navali*, disagreed with those who said that the 28-benched galley built by the Venetians [*i.e.* by Vettor Fausto] was similar to the ancient quinquereme, and he based his opinion on the authority of Pliny,<sup>437</sup> who wrote that the quinquereme had four hundred rowers. He also added this valuable information: while Caius Caligula was sailing from Astura to Antium, the quinquereme he was on board became immobilized and could not proceed – as did the other quinqueremes that were with him – although it was manned by four hundred rowers. Thus, Caligula, wishing to know the reason of this delay, ordered the vessel be checked, and it was found that a small fish remained attached to the rudder and was obstructing its movement. However, if we assume that the quinquereme had four hundred rowers, five men on each bench (as Baïf said), the quinquereme would have had forty benches on either side, and it would have been almost one third longer than the quinquereme built by the Venetians that had twenty-eight benches. Some other writers asserted that the quinquereme had three hundred men,<sup>438</sup> who, on number of five on each bench, result in a quinquereme of thirty benches, which is slightly longer than the Venetian quinquereme, which had twenty-eight benches. This is more plausible to me, because a quinquereme with forty benches would have an exaggeratedly long hull, both lengthwise and beamwise, and it would be imperfectly built and useless due to its heaviness.<sup>439</sup>

<sup>437</sup> Pantera is referring to: Plin. *HN* 32.1.

<sup>438</sup> Pantera is referring to the passage by Polybius (1.26.7) previously discussed.

<sup>439</sup> Pantera 1614, 19-20: *Onde, essendo state tanto stimate, et usate, sì da i Cartaginesi, che tennero un gran tempo il principato del mare, come da i Romani, che ebbero l'imperio del mondo, mi si porge occasione di andar per congetture, investigando di che forma potessero essere, et che simiglianza havessero con le galee, che a questi tempi usano. Lazaro Baifio nel libro che ha fatto De re navali, si oppose a quelli che dicevano che una galea di ventiotto banchi fabricata da i Venetiani fosse simile di forma all'antica quinquereme, et fondava le sue ragioni con l'auttorità di Plinio (libr. 32, cap. 1), dove dice che la quinquereme haveva quattrocento huomini da remo; soggiungendo questa stupenda cosa, che, mentre Caio Caligula Imperatore navigava da Astura ad Antio, gli fu trattenuta la quinquereme, sopra la quale egli era di maniera, che non poteva caminar, quanto le altre, che erano seco con gran meraviglia sua, benchè fosse vogata da quattrocento huomini, però, desiderando saper la causa di questo impedimento, ordinò che si rivedesse il vascello con ogni diligenza, et si trovò che si era attaccato un pesciolino al timone che non lo lasciava scorrere. Però, portando le quinqueremi sino a quattrocento huomini da remo a cinque per banco (dice il Baifio), bisognava che la quinquereme avesse havuto quaranta banchi per ciascun lato, onde veniva ad essere quasi per la terza parte maggiore della galea fabricata da i Venetiani di vent'otto banchi. Hanno detto alcuni altri che la quinquereme portava trecento huomini da remo, i quali, computati a ragione di cinque per banco, vorrebbero a far la quinquereme di trenta banchi, che sarebbe poco maggiore della galea venetiana di vent'otto: et quella opinione mi pare più verismile perchè, se la quinquereme avesse havuto quaranta banchi, sarebbe stata*

Fausto purported to investigate “the principle for the oar [arrangement] that was used in ancient times and that has been long forgotten,” the *antiqui remigii rationem tota annos iam sepultam*.<sup>440</sup> In order to assess the oar mechanics of his quinquereme, Fausto followed the most ancient tradition on mechanical inquiry, which was based on the authority of Aristotle (384-322 B.C.E.). The study of the “Mechanics” by the Aristotle reveals how great and significant was Aristotle’s contribution to both ancient and Renaissance naval architecture.<sup>441</sup>

In his “Fourth Question,” Aristotle’s main concern was to investigate the propulsion of a ship, “Why do the rowers in the middle of the ship contribute most to its movement?”<sup>442</sup> Aristotle solved this problem by comparing the oar to a lever:

The oar acts like a *lever*, for the thole-pin is the fulcrum (for it is fixed), and the sea is the weight, which the oar presses; the sailor is the force which moves the bar. In proportion as the moving force is further away from the fulcrum, so it always moves the weight more; for the circle described from the centre is greater, and the thole-pin, which is the fulcrum, is the centre. The largest part of the oar is within in the centre of the ship. For the ship is broadest at this point, so that it is possible for the greater part of the oar to be within the sides of the ship on either side. Therefore, the movement of the ship is caused, because the end of the oar, which is within the ship, travels forward when the oar is supported against the sea, and the ship, being fastened to the thole-pin travels forward in the same directions as the end of the oar. The ship must be thrust forward most at the point at which the oar displaces most sea, where the distance between the handle and the thole-pin is greatest. This is the reason why those in the middle of the ship contribute most to the movement of the

---

*un vaso di sterminata lunghezza, et non essendo proportionato anco per la lanrghezza, sarebbe senza dubbio riuscito imperfetto, et inetto per la gravezza.*

<sup>440</sup> Letter written by Fausto to Ramusio, dated 13 September 1530; in Weber 1894, 129.

<sup>441</sup> Regrettably, a study focusing on Aristotle and mechanical problems applied to naval architecture has yet to be undertaken.

<sup>442</sup> Arist. *Mech.* 4.850b.10.

ship; for that part of the oar which stretches inside from the thole-pin is greatest in the middle of the ship.<sup>443</sup>

However, the work by Aristotle does not provide the necessary information for the mechanism of the oaring, the length of each oar, and how to avoid interference with one another. From a theoretical point of view, Apollonius of Perga (262-190 B.C.E.), in his “Conics,” discusses at length the mechanism of levers, but Fausto must have conducted some trials on his own. Fausto’s quinquereme was manned *alla sensile* (in the simple way), with five rowers on each bench, each pulling a single oar. In the words of Drachio, this rowing system with five rowers caused many problems, “for the fifth oar interfered with the fourth, the fourth interfered with the third, the third with the second, and the second with the first, and, one could see that often – if not always – during the stroke, the second hit the water in the furrow made by the first with its blade, the third by the second, the fourth by the third, and the fifth by the fourth.”<sup>444</sup>

At some time, Fausto continued the *alla sensile* rowing system and adapted in his quinquereme the *alla scaloccio* system of rowing (“in the ladder way”), with five men pulling the same oar. The oar for *alla scaloccio* rowing system was bigger and heavier than the one required for *alla sensile* system, and the former required the same number of rowers as the latter. The “Drawing of the Galleass built in the Fausto’s way” (*Disegno*

---

<sup>443</sup> Arist. *Mech.* 4.850b.10-29. Translation by Hett 1936, 355 (italics mine).

<sup>444</sup> ASVe, Archivio Proprio Contarini, env. 25 (*Visione di Baldissera Quintio Drachio*), fols. 13v-14r: *Il quinto impediva il quarto, et il quarto il terzo, et il terzo il secondo, et il secondo il primo, di modo che si vedea che nel vogar spesse volte se non sempre feriva il secondo nel solco formato del primo con la pala, et il terzo nel secondo, et il quarto nel terzo, et il quinto nel quarto.*

*di galeazza alla Faustina*) from the *Architettura navale* by Stefano de Zuanne (1686), clearly depicts a galleass rowed *alla scaloccio* (fig. 4).



Fig. 4. Galleass “in the Fausto’s way” (*alla Faustina*).  
Stefano de Zuanne, *Architettura navale*, 1686.  
After: Anderson 1962, pl. 13B.

The earliest evidence for the introduction of long *alla scaloccio* oars is in a document dated to 30 July 1534, which discusses the dispatch of sixty long oars for the sea captain.<sup>445</sup> At that time, the *alla scaloccio* rowing system was already in use in the Western Mediterranean by the Genoese, Spaniards, and French. A document dated to 25 June 1521 seems, however, to attribute to the French the invention of the new rowing system *à la galoche* (in Venetian *alla galozza*, and later *alla scaloccio*). It consisted of four men pulling the same oar on one single bench. A senatorial decree dated to 19 January 1542 asserted that “*Dominus Vettor Fausto*, who has been always faithful and

<sup>445</sup> ASVe, Patroni e Provveditori all’Arsenale, reg. 8, fol. 37v; in Bondioli 1995, 178, n. 43.

helpful, and always purported to provide us with the benefit of his clever inventions that he made in the past and that are worthy of praise, since he improved our galleys. In this present day, he devised a new system to arrange the crew of the galleys, so that both the rowers hired from the mainland and those from the Levant (*i.e.*, convicts from Dalmatia) would be able to row easily.”<sup>446</sup>

It has been suggested that the *alla scaloccio* rowing system was introduced when the shortage of trained and professional rowers, which are essential for *alla sensile* rowing system, compelled the Venetian navy to impress slaves and convicts (*forzati*) for rowing aboard galleys. The above document is cited also by Tenenti, who explains that the term “rowers from the Levant” actually denotes convicts and slaves from Dalmatia.<sup>447</sup> Fausto also referred to *le zurme di terra ferma*, “rowers from the mainland,” meaning that they were not trained rowers.<sup>448</sup> Thus, this document might suggest that, in 1542, Fausto proposed to the Venetian Senate to change the rowing system of galleys from *alla sensile* to *alla scaloccio*, a system which he probably employed on his quinquere shortly thereafter.

The praise for Fausto’s “clever inventions,” which opens the document, might indicate that Fausto himself was the one who introduced the new rowing system to the

---

<sup>446</sup> ASVe, Senato mar, reg. 26, fols. 160v-161r: *Invigilando Domino Vettor Fausto con ogni studio, et diligentia al beneficio delle cose nostre per la molta affitione, et fideltà soa verso de noi, oltra le altre cose ingeniose, et degne di laude dallui fatte per il passato di utilità grande nelle nostre galee, al presente ha escogitato un modo di acconciar talmente esse galee, che le zurme di terra ferma le potranno vogare commodamente come fanno quelle di levante.*

<sup>447</sup> Tenenti 1962, 91, n. 19.

<sup>448</sup> Bondioli (1995, 178, n. 43) notes that “It certainly seems curious that at this time (1534), the records do not attribute this invention to Vettor Fausto (who launched his quinquere two years earlier and did not neglect his studies of rowing after that date because in 1542 he presented a plan on this subject for mainland galleys.” Actually Fausto launched his quinquere in 1526 and not in 1532, and the phrase “mainland galleys” refers not to a certain type of galley, but to galleys that were rowed by unskilled men recruited from the mainland.

Venetian fleet, which was a novelty for the Republic. Moreover, in *Della milizia marittima* by Cristoforo da Canal, we learn that Fausto presented a second proposal to the Senate regarding the oars. The main problem was to reduce the weight of the oars to make the activity of rowing lighter and less tiring. Cristoforo da Canal wrote that “...the oars should be made of beech rather than maple wood [...] because beech is much stronger and less permeable to water than maple wood, which, although is more flexible, as it is not so hard, upon becoming impregnated with water, it swells, and, thus becomes much heavier.”<sup>449</sup> Thus – continues Cristoforo da Canal – “...Fausto accordingly suggested that an oar should be made of fir or larch: either one section of the oar of (fir) and the other of (larch), or the entire oar made of a single type of wood.”<sup>450</sup> Fausto’s proposal of wood choices for oars was not accepted, whereas that of Cristoforo da Canal, which used beech for oars, was approved by the Senate. In 1550 the Venetian Republic acquired the beech forest of the Cansiglio, close to Treviso, whose wood was specifically used for making oars.<sup>451</sup>

Fausto also studied the steering mechanism of the stern rudder. In doing so, he again turned his attention to Aristotle, who also investigated the steering mechanism of ships in his “Fifth question.” Aristotle Stagirite lived in the fourth century B.C.E.

Therefore, he referred to the quarter rudder, the  $\pi\eta\delta\acute{\alpha}\lambda\iota\omicron\nu$  (pēdalion), (or the Latin

---

<sup>449</sup> Cristoforo da Canal, *Della milizia marittima*, book 1: *i remi più tosto di fò che di aere [...] perchè il fò è di gran lunga più forte tanto che meno condannabile al mare dell’aere, il quale sebbene è più pieghevole, essendo, nondimeno men forte riceve in sè l’acqua et gonfiandosi in processo di tempo diviene molto più greve*; in Nani Mocenigo 1930, 79.

<sup>450</sup> Supra n. 448: *Fausto, il quale ha prudentemente anco pensato che i remi si possono fare anco di abete et di larice, o una parte di uno et l’altra dell’altro, o vero tutti d’un solo*. In this passage, the Sea Captain Cristoforo da Canal is referring to the outboard portion of the oar, and to the inboard portion (*zirone*), the latter being one third of the length of the oar. The division on the oar was marked by the socket for the thole, the vertical pivot on which the oar rested that served as a fulcrum.

<sup>451</sup> Agnoletti 2007, 115.



*gubemacula*, which became the medieval *temones*), and not to the stern rudder, which came into use much later.<sup>452</sup> However, the mechanical principle was the same. In the “Fifth Question,” Aristotle’s main question is:

Why does the rudder, which is small and at the end of the vessel, have so great power that it is able to move the huge mass of the ship, though it is moved by a smaller tiller and by the strength of but one man, and then without violent extension? Is that because the rudder is a bar, and the helmsman works a lever? The point at which it is attached to the ship is the fulcrum, the whole rudder is the lever, the sea is the weight, and the helmsman is the motive force. The rudder does not strike the sea at right angles to its lengths, as an oar does. For it does not drive the ship forward, but turn it while it moves, receiving the sea at an angle. Since the sea is the weight, it turns the ship by pushing in a contrary direction. Indeed the lever and the sea turn in opposite directions, the sea to the inside and the lever to the outside. The ship follows because it is attached to the rudder. The oar pushes the weight against its breadth, and, being pushed by it, the oar in return drives the ship straight forward. On the contrary, the rudder, being placed aslant, causes movement also to be at an angle, either in one direction or the other. It is placed at the stern, and not in the middle of the ship, because the part moved can move most easily when the moving agent acts from the end. For the first part moves most rapidly because as in other travelling bodies, the travel ceases at the end, so in a continuous body the travel is weakest at the end.<sup>453</sup> If, then, it is weakest there, it is at that point easiest to ship it from its position. This is why the rudder is at the stern and also because, as there is very little movement at that point, the displacement is much greater at the

---

<sup>452</sup> In Northern Europe, the earliest archaeological evidence for a stern rudder connected to the straight post is seen on the Kollerup cog, in Southern Denmark, dated to 1150s; see Hocker and Dokkedal 2001, 16-7. The Tournai baptismal font of the Cathedral of Winchester, dated to ca. 1150, suggests that the pintle-and-gudgeon rudder came into use in this period; see Sleeswyk and Lehmann 1982, 279-303; Mott 1997, 106. In the Mediterranean, the earliest archaeological evidence for a single rudder is seen in the Venetian galley found in San Marco in Boccalama (C.E. 1328). This galley – probably a great galley (*galea grossa*) – also provides the earliest iconographical evidence for the stern rudder. A graffito depicting a light galley with a stern rudder was found on an inaccessible portion of a ceiling plank, suggesting that the engraving was made during the construction of the galley (Fozzati 2002, 75; D’Agostino 2003, 25).

<sup>453</sup> As already noted by Leon Battista Alberti in his *De re aedificatoria* (5.13), “the number of rudders increases the stability of the ship, but it diminishes its speed” (*Temonum numerus navi auget firmitatem, minuit velocitatem*).

end, because the same angle stands on a large base, and also because the enclosing lines are greater. From this, it is obvious why the ship moves further in an opposite direction than the oar-blade: for the same mass, when moved by the same force, will travel further in air than in water.<sup>454</sup>

Fausto, in his *Aristotelis mechanica*, graphically represented the “Fifth Question” of Aristotle – known as the parallelogram of velocity, and he adapted it to the stern rudder (fig. 5)

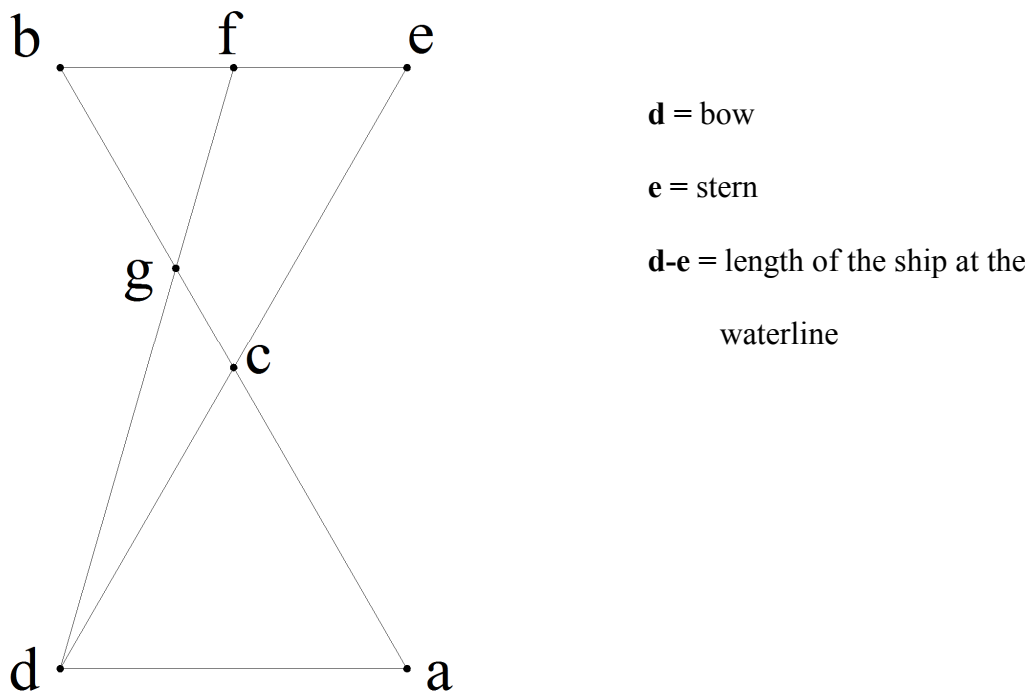


Fig. 5. The “Fifth Question” from Fausto’s *Aristotelis mechanica*, fol. 10r.  
 Drawing: L. Campana.

<sup>454</sup> Arist. *Mech.* 5. 850b.30-851a.18.

Maneuvering the sternrudder and covering the distance  $e-b$ , the force of the rudder moves the ship so much that the stern ( $e$ ) is now at  $b$  and the bow ( $d$ ) is now at  $a$  and the position of the ship is now defined by  $b-a$  (length of the ship at the waterline). Note that the stern covered the distance  $e-b$  and the bow covered the distance  $d-c$  which describes the base of an equilateral triangle. Therefore, if the distance covered by the stern is known, say  $e-f$ , it is then possible to know the distance covered by the bow  $d-g$ .

In 1686, the Venetian Steffano de Zuanne, in his *Architectura navale* (“Naval Architecture”) compared the stern rudder “in the Western way” (alla Ponentina) with the stern rudder built “in the Fausto’s way” (fig. 6) noting of the latter:

...not perpendicular, it is too wide and, for this reason, it causes many problems. When the ship sails with lighth wind, the stern rudder shifts toward the sides because it not perpendicular, and, being so, there forms a gap between the stern rudder and the sternpost, where the water passes and make the steering of the stern rudder ineffective. If the blade is positioned perpendicularly, the end portion of the stern rudder moves towards to the left [port], as can be seen from the drawing and, for this reason, the galley is slow, and this might cause the loss of the rudder at any time. Conversely, the stern rudder in the Western way is always perpendicular to the sternpost with no gaps and the galley sails perfectly and speedily, and there is no concern that it could break; it can be managed more easily and safely, as has been experienced several times.<sup>455</sup>

---

<sup>455</sup> BLL, Add. Ms. 38655, fol. 27r: [*quello alla Faustina*] *così storto con quella larghezza che si sente, non poco tormenta, oltre che, andando a vella con vento scarso la galia, il timon si tien tutto alla banda, onde per esser così storto, per necessità forma un vacco tra l’asta et il timon che passano di la l’acqua non sente il governo, e così intressata la palla alla dritta manda la punta di sotto alla sinistra, come si vede, e causa che la galia perde non poco di camino, e sempre con pericolo di perdere il timon. Ma quello alla ponentina, che sta sempre unito all’asta, la galia non sente tormento, non perde il camino, non vi è pericolo di rompersi, si governa con più facilità e sicurezza, come da molte esperienze si è veduto.*

The drawing made by Steffano de Zuanne of the stern rudder *alla Faustina* shows a curved sternpost – inherited from the medieval ships and galleys – on which is mounted a rudder with a curved blade. A similar arrangement can be found, for example, on the Venetian *galea grossa* depicted in the *Libro di appunti di Zorzi Trombetta da Modon* (“The Notebook of Zorzi Trombetta from Modon”), with the only exception being in the extremity of the curved blade of the rudder *alla Faustina*, whereas the extremity of the blade of the *galea grossa* is straight.<sup>456</sup>

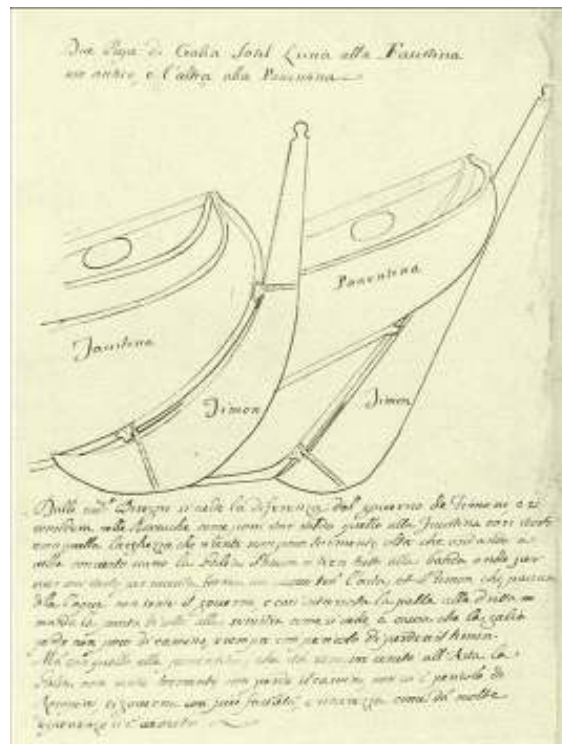


Fig. 6. Stern rudder “in the Fausto’s way” (left) and “in the Western way” (right).  
Steffano de Zuanne, *Architettura navale*, 1686.  
After: Concina 1990, fig. 59 (page not numbered).

<sup>456</sup> BLL, Cotton ms., Titus A XXVI, fol. 48v.

On the “Drawing of the galleass built in the Fausto’s way” (*Disegno di galeazza alla Faustina*) (fig. 4), Stefano de Zuanne wrote: “[This drawing] illustrates an easy way – invented by me – to reduce the [proportions] of the galleasses built in the Fausto’s way. There is a [stern] post built in the Western way, the first improvement that was made to the galleass. [The galleass] was built by me, in the *Porton* of the Galleasses,<sup>457</sup> in May 1669, and [I am still today building this type of vessel], and all the modifications to its shape are visible [in this drawing].”<sup>458</sup>

Fausto’s contribution to the study of mechanics is acknowledged in the *Liber mechanicorum* (“Book on Mechanics”) published in 1577 in Venice by Guidobaldo dal Monte (1545-1607).<sup>459</sup> The Italian mathematician Filippo Pigafetta (1533-1604), in 1581, made an Italian translation of Guidobaldo’s work. In the dedication he wrote:

With the fall of the Roman Empire and the appearance of the barbarians in Italy, Greece and Egypt and those places where arts and letters had prevailed, nearly all the sciences declined miserably and were lost. Mechanics in particular was for a long time neglected [...] But it seems that after a certain time the noblest arts and teachings, such as letters, philosophy, medicine, astrology, arithmetic, music, geometry, architecture, sculpture, painting and, above all, mechanics, were revived back to light from dark shadows in which they had lain buried.<sup>460</sup>

Among the contributors to the science of mechanics, Pigafetta also mentioned Vettor Fausto.

---

<sup>457</sup> It was an area of the Arsenal.

<sup>458</sup> BNM, Add. Ms. 38655, fol. 67v: *Modo facile da me inventato per ridur le galeazze alla Faustina, con l’asta alla Ponentina, la prima fatura si fece alla galeaza. Al Porton delle Galleazze, da me levata sino l’anno 1669 di Maggio come al presente, si pol vedere, con altrea giunte nella stesa forma.*

<sup>459</sup> Bertoloni Meli 1992, 27; Henninger-Voos 2000, 233-59.

<sup>460</sup> Pigafetta 1581, dedication (page not numbered).

## CHAPTER V

*MISURE DI VASCELLI ETC. DI...PROTO DELL'ARSENALE DI VENETIA***Introduction**

The 16<sup>th</sup> century was a period of significant changes in ship design, and can be regarded as an experimental transition in naval architecture.<sup>461</sup> The *galia sottile*, the warship *par excellence* of the Venetian fleet, was progressively modified in its design and adapted to the new requirements of warfare. Since the invention of gunpowder and the subsequent use of cannons aboard ships, galleys carried light chaser guns (*bombarde*) mounted on the bow, in the area called *palmetta*.<sup>462</sup> The relatively light weight of the early guns placed in this area between the *giogo* of the bow and the *sperone* did not alter the overall shape of the hull.<sup>463</sup> Between the 15<sup>th</sup> and the 16<sup>th</sup> centuries, major changes were introduced in the structure of the hull, whose balance was compromised by the increase of guns aboard ship. In order to solve the problem of balancing, Venetian shipwrights experimented and adopted different strategies in shipbuilding construction. Significant changes included an increase in hull volume, consequently, moving the midship frame forward toward the bow. In addition, Venetian shipwrights used the *calcagnol*, a gripe inserted between the baseline (*carena*) and the keel, whose purpose was to increase the height of both the posts and to improve the

---

<sup>461</sup> Barker 1988, 540-1; Hocquet 1991a, 403-12.

<sup>462</sup> For a glossary of naval architecture terminology, see APPENDIX II.

<sup>463</sup> *Supra* n. 461.

stability of the keel.<sup>464</sup> In traditional shipbuilding practices employed by the Venetian *proti*, these innovations were the result of continuous empirical research.

The quinquereme built by Fausto can be regarded as the highest point of experimentation and innovation ever reached in Venetian naval architecture in the Arsenal. The quinquereme was the largest ship ever designed and built in the *squeri* (shipsheds) of the Serene Republic, and we can recognize a subtle connection that links Fausto's quinquereme to the robust galleasses that were built until the second half of the 18<sup>th</sup> century.<sup>465</sup>

However, as was already discussed in the previous chapter, Fausto claimed that the design of the quinquereme was not based on an empirical method, but rather on a *navium ratio*, a shipbuilding principle. If on one hand, the *marina architectura* was based on theoretical knowledge acquired from recovered Classical texts, on the other, it implied a deep acquaintance with the rules of mathematics and geometry. In 1838, Casoni in his article titled "The Venetian Multiple-oared Vessels," in the section devoted to Fausto's ship, stated that "the design, the armament, and the rowing system and its mechanisms of the quinquereme are still unknown."<sup>466</sup> Richard Barker, in a brilliant, enlightening contribution on naval architecture published in 2007, stated that "little is known about Fausto's *real* contribution to shipbuilding, (other than rowing arrangements), except that they were not all successful, or lasting."<sup>467</sup> The technical

---

<sup>464</sup> Bondioli 1995, 173.

<sup>465</sup> Lane, 1991, 71; Tucci 2002, 139.

<sup>466</sup> Casoni 1838, 337.

<sup>467</sup> Barker 2007, 42.

innovations introduced by Fausto have still to be fully understood and appreciated, and the rowing arrangement is a topic that has not yet been fully exploited.<sup>468</sup>

The manuscript *Misure di vascelli etc. di...proto dell'Arsenale di Venetia* (“Measurements of [Various] Ships...by [a] Master Shipbuilder of the Arsenal of Venice”) has been known since 1881, when Fincati briefly mentioned it in his discussion about light galleys in his book “Le triremi.”<sup>469</sup> In 1964, the famous Venetian historian Ugo Tucci, in his article titled “Architettura navale veneziana. Misure di vascelli della metà del Cinquecento” (“Venetian Naval Architecture. Ships Measures from the mid-15<sup>th</sup> century”), published the transcription, albeit with some errors.<sup>470</sup>

The *Misure di vascelli etc. di...proto dell'Arsenale di Venetia* is a 16<sup>th</sup>-century shipbuilding manuscript that records “measurements of [various] ships...by [a] master shipbuilder of the Arsenal of Venice.”<sup>471</sup> The manuscript belonged to the intellectual and man of letters Gian Vincenzo Pinelli (1535-1601), of noble Genoese origin, patron and avid collector of books and manuscripts. He possessed one of the best private libraries in Italy during the second half of the 16<sup>th</sup> century.<sup>472</sup> Pinelli gathered his valuable collection while living in Padova, where he founded a humanist circle of erudite scholars. Although his correspondence with the most famous Italian and European intellectuals, such as the collector Fulvio Orsini (1529-1600), the humanist

---

<sup>468</sup> The only biographic study devoted to Fausto and his work in the Arsenal is that by Ennio Concina (1990). However, Concina does not discuss any of the technical aspects of the quinquereme.

<sup>469</sup> Fincati 1881, 80-1.

<sup>470</sup> Tucci 1964, 277-93. See discussion below. I thank Mauro Bondioli for reviewing my transcription.

<sup>471</sup> It is conserved in the State Archive of Venice, in the envelop 2 of the folder titled Archivio Proprio Pinelli (ASVe, Archivio Proprio Contarini, env. 2).

<sup>472</sup> Grendler M. 1980, 386-416. For the life and library of Gian Vincenzo Pinelli, see Gualdo 1607; Rivolta 1914 and 1993, xvii-lxxx; Raugei 1988; Dupuy and Raugei 2001.



Torquato Tasso (1544-1595), and the traveler Filippo Pigafetta (1533-1604), has been partially studied,<sup>473</sup> Pinelli included among his friends the scientist Galileo Galilei (1564-1642).<sup>474</sup>

Over the centuries, the magnificent collection of Gian Vincenzo Pinelli was dispersed and it underwent several serious misfortunes. Pinelli, at his death, left the library to his nephew Cosmo Pinelli, who had planned to establish a library in honor of his uncle, but died shortly afterwards. Successively, part of the collection was stolen and plundered by a servant; later, the Venetian Senate confiscated all the material concerning sensitive affairs relating to the Venetian State. Upon the death of Cosmo (31 October 1602), the Pinelli collection passed to his son. While sailing aboard a ship bound for Naples, Turkish pirates attacked the ship off the coast of Fermo (Adriatic coast) and threw overboard 33 chests containing manuscripts and other valuable items, such as mathematical instruments. Of these, 22 chests of books were recovered, but the others all perished.<sup>475</sup> The remaining portion of the Pinelli collection found its way to Naples, where Cosmo's widow sold it in an auction in 1608. The collection was bought by agents of Cardinal Federico Borromeo (1564-1631) for 3,050 *scudi*, who later sold in Naples some books judged to be less valuable. One-third of the original core of the Pinelli collection survives today and is housed in the Ambrosiana Library of Milan.

---

<sup>473</sup> Dupuy and Raugei 2001, 10-15.

<sup>474</sup> Galilei became involved with Pinelli toward the end of the 16<sup>th</sup> century, when he started teaching at the University of Padua. Pinelli owned unpublished manuscripts and various notes on optics by Ettore Ausonio and Giuseppe Moletto, the latter a professor of mathematics at the University of Padua and the former a mathematician and physician from Venice. Pinelli's interest in optics is shown by his collection of optical instruments. On Galileo and Pinelli, see Grendler 1981, 145-8; Dupré 2002, 111-47, and 2003, 73-84; Nuovo 2007a, 133, and 2007b, 55.

<sup>475</sup> Gualdo 1607, 110-13; Rivolta 1933, lxxi.

The Archivio Proprio Pinelli (Pinelli's personal collection) in the State archive of Venice comprises documents that range in date from 1380 to 1594, with later additions dating to 1670-1674.<sup>476</sup> The content of these documents pertains mostly to Venetian political and military affairs, such as the many reports and manuscripts about the wars against the Ottomans.

### **Description of the Manuscript**

The manuscript *Misure di vascelli etc. di...proto dell'Arsenale di Venezia* totals 42 folios, including the title page (fol. 4v left blank). The folios are numbered consecutively from 1r to 21r on the upper right corner, except the title page. The foliation, which was added later by a different hand, follows the manuscript's original pagination, as proven by the catchwords. The author of the foliation is the same person who wrote the title and added the writing "FF-25" on the upper margin of the title page. The writing "FF-25" indicates the manuscript's previous location, which was always the State Archive of Venice, but among "miscellaneous manuscripts" rather than among the documents belonging to Pinelli.<sup>477</sup>

The *scriptor* wrote in a mercantile cursive hand employing an indelible dark brown ink. The *ductus* remains uniform and regular throughout the manuscript. The handwriting suggests that the manuscript was composed (or copied) by a single person. The writing area (19.5 x 11 cm) of each folio is composed of 14 to 18 lines.

---

<sup>476</sup> Rivolta 1933, 25.

<sup>477</sup> ASVe, Miscellanea Codici, n. 125, FF 25.

*Misure di vascelli etc. di...proto dell'Arsenale di Venetia* is a later copy of an earlier manuscript. The latest date when the original manuscript could have been written is provided in folio 17r, which records the instructions to build a galleon (*galion*) of 1500 *botte*.<sup>478</sup> The date reported for the galleon's construction is 1 April 1546. The earliest date for when the manuscript could have been written is given in folio 15r, which records instructions for a great galley (*galia grossa*) said to have been built on 25 April 1530.

The content of the manuscript can be summarized as follows:

- |         |   |
|---------|---|
| fol. 1r | <p>Full-load draft of the following ships:</p> <ul style="list-style-type: none"> <li>- light galley (<i>galia da 3</i>)</li> <li>- galley with 4 oars per bench (<i>galia da 4</i>)</li> <li>- galley with 5 oar per bench (<i>galia da 5</i>)</li> <li>- great galley or galleass (<i>galia grossa over galiaza</i>)</li> <li>- <i>fusta</i></li> <li>- ship (<i>nave</i>) of 500 <i>botte</i></li> <li>- ship (<i>nave</i>) of 1000 <i>botte</i></li> <li>- ship (<i>nave</i>) of 1500 <i>botte</i></li> </ul> |
| fol. 1r | <p>List of two-decked ships:</p> <ul style="list-style-type: none"> <li>- galleons</li> <li>- <i>barza</i><sup>479</sup></li> <li>- ship (<i>nave</i>)</li> </ul>   |
| fol. 1v | <p>Number of benches on the following ships:</p> <ul style="list-style-type: none"> <li>- great galley (<i>galia grossa</i>), 25 benches per side</li> <li>- <i>bastardella</i>, 26 benches per side</li> <li>- light galley (<i>galia sottil</i>), 25 benches per side, 24 benches per side on the other</li> <li>- <i>fusta</i>, 20 benches per side</li> <li>- <i>bregantin</i>, 14 benches per side</li> </ul>  |

---

<sup>478</sup> One *botte* equals approximately 0.6 deadweight tons, see Lane 1964, 222-3; Tucci 1967, 215-17; Lane 1973, 479-80; Hocquet 1991b, 313-8; Lane 1992, 247.

<sup>479</sup> In Venetian archival documents, the *barza* is also referred to as *nave piccola* (or small ship), see ASVe, Senato mar, reg. 14, fol. 196r.

- *fregata*, 8 benches per side

fol. 2v-3r	Description of the deck of a galley
fol. 3r-3v	Description of the stern area of a galley
fol. 4r	Artillery on board a galley
fol. 4r	Length ( <i>lunghezze</i> ) of a galley (length over all, maximum breadth, depth in the hold)
fol. 4v	Blank
fol. 5r-5v	Measurements of a galley with five oars per bench ( <i>galia da 5</i> )
fol. 6r-6v	Molds ( <i>sesti</i> , or templates) for the galley with five oars
fol. 7r-8v	Measurements of galley for the Admiral of the Sea ( <i>Provveditor</i> ) either with four oars per bench, or with three oars per bench
fol. 9r-10r	Measurements of a galley with four oars per bench ( <i>galia da 4</i> )
fol. 10r-11r	Measurements of the Captain's galley ( <i>galia da zeneral</i> ) with four oars per bench
fol. 11r-11v	Measurements of galley for the Admiral of the Sea ( <i>Provveditor</i> ), continued
fol. 11v	Measurements of a light galley ( <i>galia da 3</i> )
fol. 12r	Measurements of a galley for the Admiral of the Sea ( <i>Provveditor</i> ), continued
fol. 12r-12v	Measurements of a galley with four oars per bench ( <i>galia da 4</i> ), continued
fol. 12v-13r	Measurements of a light galley ( <i>galia da 3</i> ), continued
fol. 13r-13v	Measurements of a galley for the Admiral of the Sea ( <i>Provveditor</i> ), continued

fols. 13v-14v	Measurements of a light galley ( <i>galia da 3</i> ), continued
fols. 15r-16r	Measurements of a great galley ( <i>galia grossa</i> )
fols. 16v-17r	Measurements of a light galley ( <i>galia da 3</i> ), continued
fols. 17r-19r	Measurements of a galleon ( <i>galion</i> ) of 1500 <i>botti</i>
fols. 19v-20r	Description of the deck of a galley (copy of fols. 2v-3r)
fols. 20r-20v	Description of the stern area of a galley (copy of fols. 3r-3v)
fol. 21r	Artillery on board a galley (copy of fol. 4r)

Ugo Tucci suggests that the manuscript is:

...one of those personal notebooks that the master shipbuilders of the Arsenal of Venice usually compiled, either for their own use or for the use of their pupils, to whom they secretly communicated their expertise; often times the personal knowledge was transmitted from father to son. [These manuscripts] have no literary value, and they were, with all probability, addressed to people who already possessed some specific, technical background. Indeed, they record basic measurements of the ship's hull, and, sometimes, the recorded measurements are accompanied by suggestions about the recording procedure or comments about technical features that are noteworthy for their difficulty and novelty.<sup>480</sup>

---

<sup>480</sup> Tucci 1964, 277: *Si tratta di uno di quei d'appunti del mestiere che i protti dell'Arsenale di Venezia tenevano per memoria propria ovvero ad uso di una cerchia ristretta d'allievi ai quali li confidavano segretamente; spesso venivano trasmessi di padre in figlio. Privi d'intenti letterari e destinati a persone che già possedevano un certo grado di preparazione specifica, si limitano di solito all'annotazione di misure delle strutture essenziali dei vascelli, talvolta integrate da brevi suggerimenti sul modo di codurle e su particolari tecnici meritevoli di rilievo per una qualche loro difficoltà o anche per innovazioni costruttive.*

The *Misure di vascelli etc. di...proto dell'Arsenale di Venezia* is unique for several reasons. First, the content of the manuscript presents a desultory character and does not have a linear, organized exposition. For example, the measurements of the various ships are not in consecutive order, but are randomly presented. It is likely that the copyist was transcribing some loose, unorganized folios and did not have the patience, or perhaps the knowledge, to put them in proper order.

The suggestion that the copyist did not belong to the maritime milieu of Venice and that he lacked the specific, technical background mentioned by Tucci is evident from the first folios.<sup>481</sup> Indeed, on the folios 1r-4r, the copyist listed ship components in a descriptive manner, as if it was a glossary of naval architecture terms. Although the meanings of many of the terms recorded by the copyist have now mostly been explained by modern scholarship,<sup>482</sup> the list contained in the first folios is of particular interest. It can be considered the first Venetian systematic glossary of nautical terms. In confirmation that the copyist was not a master shipbuilder of the Arsenal of Venice, folios 2v-4r are repeated at the end of the manuscript in folios 19v-21r, respectively. In addition, in folio 6r, the copyist confused the word sixth (*sesto*) with the word mold (*sesto*), both of which are spelled in the same way.

For their clear didactic intent, the first and last folios (1-4r; 19v-21r) stand apart from the rest of the manuscript. It is likely that they did not belong to the original core of

---

<sup>481</sup> *Supra* n. 479.

<sup>482</sup> The following scholars have greatly contributed to the study of Venetian naval architecture: Anderson 1925, 135-63, Lane 1934, 24-49; Anderson 1945, 160-7; Bellabarba 1993, 274-92, Bondioli 1996, 67-80; 2003, 222-7; Bondioli and Penzo 1999, 67-80.

the manuscript. Folio 4v, which is left blank, further proves this view, since it emphasizes the break between the two parts.

### The Quinquereme

In 1881, the Admiral Luigi Fincati, after briefly presenting the *Misure di vascelli*, observed that “the study and the publication of this manuscript, illustrated by drawings, as well as other similar texts, would be beneficial and would greatly advance the history of naval architecture and ship construction.”<sup>483</sup>

The discussion here will focus on the quinquereme, that is to say the galley with five oars per bench (*galia da 5*). As a premise, the theoretical reconstruction of the quinquereme given here is based on the technical features and measurements recorded in Vettor Fausto’s manuscript. For this reason, it should only be regarded as an educated interpretation and a working hypothesis, rather than a final reconstruction.<sup>484</sup> This preliminary work on the quinquereme will hopefully set the framework for studying all the other ship types recorded in Fausto’s manuscript.

The folios containing the shipbuilding instructions for *galia da 5* are: 1r, 5r-v, and 6r-v. Folio 1r provides only the full-load draft of the *galia da 5*, which is 5 Venetian feet (*5 pie*).<sup>485</sup> The remaining folios provide a series of offset measurements that were taken at key points, by at least two persons, after the *galia da 5* had been built in the

---

<sup>483</sup> Fincati 1881, 82: *La pubblicazione annotata e illustrata di talune di codeste memorie, coi loro disegni, sarebbe di una grande importanza per la storia della costruzione navale.*

<sup>484</sup> The proposed reconstruction of the quinquereme greatly benefitted from discussions with Cemal Pulak who provided me with great insight and suggestions everytime I requested it.

<sup>485</sup> See Table 1.

shipyard.<sup>486</sup> In order to record each measurement exactly, the following instruments were used: a plumb line (*archipendolo*), strings, ropes, and a rod calibrated in feet and fingers.

In the Venetian system of linear measurements, the unit consisted of fingers (*dita/deda*), feet (*pie/pie'*), and paces (*passa/passi*). Venetians used two different fingers, the *dito grosso* (large finger), corresponding to 1/14 of a foot, and the *dito sottile* (small finger), corresponding to 1/16 of a foot. The basic unit was the foot, from which fingers and paces were derived (Table 1). Since the Venetian foot is equal to 34.7735 cm, which includes four digits after the decimal point, all the other measurements (paces and fingers) are also expressed up to four digits after the decimal for the purpose of consistency.

Table 1. Venetian linear system of measurement.

Unit	Metric Equivalent	
1 <i>pie'</i>	1 foot = 34.7735 cm	
1 <i>dito grosso</i>	1 large finger = 1/14 foot	$34.7735 \div 14 = 2.4838$ cm
1 <i>dito piccolo</i>	1 small finger = 1/16 foot	$34.7735 \div 16 = 2.1733$ cm
1 <i>passo</i>	1 pace = 5 feet	$34.7735 \times 5 = 173.8675$ cm

---

<sup>486</sup> It is very common to read in Venetian documents that master shipbuilders (*proti*) utilized the help of young apprentices.



Folios 5r-v and 6r-v contain a series of offset measurements that if plotted in a Cartesian plane (x and y coordinates), they render the sheer plan, the sternpost, the stem, and the midship frame, respectively, of *galia da 5*. A glossary of naval terminology is provided in APPENDIX II. It is of interest to note that the folios recording the measurements of the quinquereme included also some information of a *galea da 5* that had been built previously. For example, the stations in the *partison* of the galley built “in the former way” (*alla prima via*) were 100, whereas in the galley that is being recorded there are 85 stations.<sup>487</sup> This is a clear indication that Fausto’s quinquereme was modified in its proportions and, therefore, different from standard galleys. The transcription of folios 1r, 5r-v, and 6r-v, followed by an English translation, is presented here.

### Transcription

fol. 1r

*Una galia da 5 remi armada pesca pie 5.*

fol. 5r

*Galie da 5  
 Longa passa 28 deda 4 ½ dentro dalla  
 haste. Hanno campi 160 a deda 14 per campo.  
 Mo’ a deda 16 ½ ha campi 136 con do mezzi.  
 Et quasi la vene ad haver in ferir a prova  
 pie 19 deda 4 alla prima via. Mo’ per instarsi  
 con el ferir da poppe l’ha deda 1 manco, che  
 sono pie 19 deda 3, et più si par fina deda 8.  
 In sesto alla prima via fu campi 100 che fanno  
 passa 17 ½, ma a questa sono 85 che fanno*

---

<sup>487</sup> The *partison* is the portion of the hull comprising the frames that are narrowed and/or raised by means of geometrical methods.

*passa 17 deda 42 ½, che fanno deda 1 ½ manco ferir a poppe. Poi in ferir a poppe pie 33 deda 4 et deda 4 ½ in codama, resta nome in tutto ferir da poppe pie 33 deda 7. Sono adonque pie 19 deda 11 a prova in ferir. In partison da prova deda campi 30, sono pie 30 deda 15, in mezzo campi 5, pie 5 deda 2 ½, in partison da poppe de campi 50 pie 51 deda 9.*

fol. 5v

*in ferir da poppe pie 33 deda 8 ½. Sono in tutto pie 140 deda 14 ½, che fanno li passa 20 deda 11.<sup>488</sup> Con late 60 resta in palmete a prova pie 8 deda 5 ½. Palmetta a poppe pie 10 deda 13 ½. Dall'oro dentro dell'hasta fina alla fazza verso poppe della timonera, pie 3 deda 8. Larga la timoniera deda 8 per prova del forcame da poppe. [...]  
Le late dal cao de sesto al zovo de prova campi 11 et a poppe 22.*

fol. 6r

*Per la galia da 5 li sestì  
Prima l'hasta da poppe in squara alta pie 10 deda 10. Slanzo pie 7 deda 4. Alza al poselese del calcagnol deda 10. Dal poselese fina agno<sup>489</sup> pie 2 ½, alza la hasta luntano dal poselese in cao de pie 2 ½ deda 1 per la sua altezza. In altezza de pie 3 dalla lingua al sesto pie 1 dede 12. In altezza de pie 6 dalla ligna fina al-6-sesto<sup>490</sup> deda 2. Pie 6 deda 6 l'accorda l'hasta con la ligna. Poi pie 1 deda 4 scomenza a tornar dentro. Poi pie 2 dalla ligna al sesto torna dentro l'hasta de' 9 ½. Poi altezza deda 8 torna dentro de' 13. In altezza in cima l'hasta dalla ligna alata<sup>491</sup> pie 1 deda 2.*

<sup>488</sup> This is an error by the copyist. It should be 28 paces and not 20.

<sup>489</sup> The vernacular word *agno* corresponds to the Italian *anco/anchò/anche*, whose translation varies depending on context but it generally means “also.” The vernacular *agno* becomes in Italian *anche* for the phonological phenomenon called consonant shift. The voiced velar plosive *g* shifts into the voiceless velar plosive *c*. In addition, the consonantic group *gn* becomes *nc* in chiasitic position. The Italian *anche* derives from the Latin demonstrative pronoun *hanc* (singular feminine accusative form of *haec* meaning “this”).

<sup>490</sup> The number 6 is striken out and replaced by the copyst as *sesto* (in this context meaning “mold”).

*Slanzo dell'hasta da prova pie 9 deda 2. Alta pie 7 deda 2. Alza al poselese del calcagnol deda 10. Agno pie 3 dal poselese alza l'hasta pie uno deda 4. In cao*

fol. 6v

*de pie 6 alza l'hasta pie 1 deda 12. In alteza de pie 3 ½ dalla ligna all'hasta pie do de' 5. Per la zovela dea 7. Larghe le haste deda 9. Nebelo de' 3. Avanzano fuora l'hasta di maggiori de' 6 buoni. El suo costado in squara<sup>492</sup> la mità del sesto. In pontal pie 6 deda 1. In bocca pie 8 dea 9. Int'el 3 pie dalla ligna al sesto dea 5. Int'el 6 pie dalla ligna al sesto dea 5. Dalla mezzaria al poselese pie 4 ½ boni. Alza el sesto al poselese dea 5 buoni. Alto el sesto in la corba dea 5 ½. Partison longa pie 3 dea 2 ½ da poppe, da prova pie 3.*

### Translation

fol. 1r

The full-load draft of a galley with five oars is 5 feet.

fol. 5r

Galleys with 5 oars

The length overall, taken from the outermost edge of the posts, is 28 paces and 4 ½ fingers.

There are 160 stations [*i.e.*, frame locations] in total, each measuring 14 fingers [from center to center].

However, if you make each station of 16 ½ fingers [from center to center],

then you have in total 136 stations and two halves.

Formerly, the distance between the last molded frame at the bow and the stem was 19 feet and 4 fingers, which was effectively reduced by 1 finger

---

<sup>491</sup> The word *alata* is a vernacular form for the Latin *ad latum* meaning “on the side.”

<sup>492</sup> The term *in squara*, literally meaning “in square,” refers to the rectangle that encompasses one half of the midship frame and basically corresponds to the Cartesian coordinates within which the offset measurements are taken. See, for example, figure 11.1 showing the *squara* (rectangle) ACDF corresponding to the one half of the midship frame of Fausto’s quinquereme.

in relation to its corresponding part toward the stern.<sup>493</sup> However, if you prefer the portion of the hull toward the bow to be more slender, then add [to it] 8 fingers.<sup>494</sup>

Formerly, the molded-frame portion [of the hull] consisted of 100 stations, which measure 17 ½ paces. In this [galley], however, the stations total 85, which measure 17 paces and 42 ½ fingers. You have to subtract 1 ½ finger from the total distance between the last molded frame at the stern and the sternpost.

The distance between the last molded frame at the stern and the sternpost measures 33 feet and 4 fingers, plus 4 ½ fingers for the width [of the sternpost]. Therefore, the distance between the last molded frame at the stern and the sternpost measures [effectively] 33 feet and 7 fingers.<sup>495</sup>

So, the distance between the last molded frame at the bow and the stem is 19 feet and 11 fingers.<sup>496</sup> [The portion of the hull comprising] the molded frames at the bow have 30 stations, equal to 30 feet and 15 fingers [in total length]. The midship [portion at the bow that is not subjected to narrowing and rising of the frames] consists of 5 stations, equal to 5 feet and 2 ½ fingers. [The portion of the hull comprising] the molded frames toward the stern have 50 stations, [equal to] 51 feet and 9 fingers.

fol. 5v

The distance between the last molded frame at the stern and the stern post is 33 feet and 8 ½ fingers.

The total [length] is 140 feet and 14 ½ fingers, which is equal to 20<sup>497</sup> paces and 11 fingers.

Having 60 deck beams, the distance between the forward yoke and the stem is 8 feet and 5 ½ fingers.

The distance between the after yoke and the sternpost is 10 feet and 13 ½ fingers.

From the inner edge of the [stern] post to the mounting beam of the rudder there are 3 feet and 8 fingers. The mounting beam of the rudder is 8 fingers.

[...]

The distance between the last molded frame and the after yoke is 22 stations.

---

<sup>493</sup> The *ferir da poppe*, that is, the distance between the last molded frame toward the stern and sternpost.

<sup>494</sup> Thus, the *ferir da prova* (the distance between the last molded frame toward the stem and the stem) is 19 feet and 11 fingers.

<sup>495</sup> Indeed, 33 feet and 8 ½ fingers, minus 33 feet and 7 fingers is 1 ½ finger, which corresponds to the length that the manuscript says to subtract.

<sup>496</sup> This is obtained by summing 19 feet and 3 fingers and 8 fingers, which is the length the manuscript suggests adding in order to obtain a more slender profile toward the bow.

<sup>497</sup> The copyist mistakenly wrote 20 instead of 28. This is clear from the calculations.

The distance between the last molded frame and the forward transverse outrigger beam is 11 stations.

fol. 6r

Galley of 5: the molds

First of all, the height of the sternpost is 10 feet and 10 fingers.

The rake [of the sternpost] is 7 feet and 4 fingers.

At the point where the keel rises, the gripe is 10 fingers high.

From the point [reference, origin], [measure] 2 ½ feet [along the baseline],

measure 2 ½ feet in height [from the origin along the perpendicular]

measure 3 feet in height. From the perpendicular, measure 1 foot and 12 fingers. Measure 6 feet in height. After the sixth [feet], add 2 fingers.

At 6 feet and 6 fingers the sternpost coincides with the perpendicular.

At 1 foot and 4 fingers the sternpost curves inward.

Then measure 2 feet. From the perpendicular the sternpost curves inward by 9 ½ fingers. Then measure 8 fingers. [The sternpost] curves inward by 13 fingers.

The extremity of the perpendicular. From the perpendicular toward its [right] side measure 1 foot and 2 fingers.

The rake of the stem is 9 feet and 2 fingers.

The height [of the stem] is 7 feet and 2 fingers.

At the point where the keel begins to rise, the gripe is 10 fingers high.

At 3 feet from the point [of the gripe] measure 1 foot and 4 fingers in height. Measure

fol. 6v

6 feet [along the baseline]. Measure 1 foot and 12 fingers in height.

Measure 3 ½ feet in height. From the perpendicular to the stem is 2 feet and 5 fingers. The yoke is 7 fingers wide.

The [stem and the stern]post are 9 fingers wide and 3 fingers deep.

The frames extend beyond the post good 6 fingers.

[The measurements] of one half of a frame in square.<sup>498</sup>

The depth in the hold is 6 feet and 1 finger.

The maximum beam [of the ship] is 8 feet and 9 fingers.

At 3 feet, [measure] 5 fingers from the base line to the mold.

At 6 feet, [measure] 5 fingers from the base line to the mold.

[Measure] 4 ½ feet from the center line to the turn of the bilge.

Move the mold up from this point a good 5 fingers.

The mold is 5 fingers high in the floor frame.

The narrowing at the stern is 3 feet and 2 ½ fingers.

The narrowing at the bow is 3 feet.

---

<sup>498</sup> Supra n. 490.

## Reconstructing the Quinquereme

For clarity, the shipbuilding instructions of the *galia da 5* have been rendered by computer graphics using AUTOCAD and represented here. For the stem and the sternpost, the offsets are plotted in the Cartesian system and distances indicated by capital letters (A, B, C...) along the x and y axes; the resulting points labeled numerically (1, 2, 3...). In addition, the original text is arranged in tables, showing each phrase and its corresponding offset point.

### Sternpost

We propose the following reconstruction of the sternpost based on the offset measurements provided in folio 6r. The original text is tabulated in Table 2, showing each measurement in the original text and its corresponding translation. In addition, Table 2 shows each measurement plotted in the Cartesian system with its corresponding points represented graphically in Figure 7.

Table 2. Offset measurements of the sternpost (fol. 6r).

	Transcription	Translation	Offset Distances		Point
			Vertical (y)	Horizontal (x)	
HEIGHT OF STERN POST	Prima l'hasta da poppe alta pie 10 deda 10	The height of the sternpost is 10 feet and 10 fingers	A-B	---	---
RAKE OF STERN POST	Slanzo pie 7 deda 4	The rake [of the sternpost] is 7 feet and 10 fingers	---	A-C	1
	Alza al poselese del calcagnol deda 10	At the point where the keel rises, the gripe is 10 fingers high	A-C'	---	

Table 2. Continued.

	Transcription	Translation	Offset Distances		Point
			Vertical (y)	Horizontal (x)	
	Dal poselese fina agno pie 2 ½	From the point [reference, origin], [measure] 2 ½ feet [along the baseline]	---	A-F	2
	Alza la hasta luntano dal poselese in cao de pie 2 ½ deda 1 per la sua altezza	Measure 2 ½ feet in height [from the origin along the perpendicular]	A-F'	---	
	In altezza de pie 3	Measure 3 feet in height	A-G'	---	3
	Dalla lingua al sesto pie 1 dede 12	From the perpendicular, measure 1 foot and 12 fingers	---	A-G	
	In altezza de pie 6	Measure 6 feet in height	A-H	---	---
	Dalla ligna fina al-6 sesto deda 2	After the sixth [feet], add 2 fingers	H-I	---	
	Pie 6 deda 6 l'accorda l'hasta con la ligna	At 6 feet and 6 fingers the sternpost coincides with the perpendicular	A-4	---	4
	Poi pie 1 deda 4 scomenza a tornar dentro	At 1 foot and 4 fingers the sternpost curves inward	4-5	---	5
	Poi pie 2	Then measure 2 feet	5-L'	---	6
	Dalla ligna al sesto torna dentro l'hasta de' 9 ½	From the perpendicular the sternpost curves inward by 9 ½ fingers	---	A-L	
	Poi altezza deda 8	Then measure 8 fingers	L'-M'	---	7
	Torna dentro de' 13	[The sternpost] curves inward by 13 fingers	---	A-M	
	In altezza in cima l'hasta	The extremity of the perpendicular line	A-B	---	8
	Dalla ligna alata pie 1 deda 2	From the perpendicular towards its [right] side measure 1 foot and 2 fingers	---	A-B'	

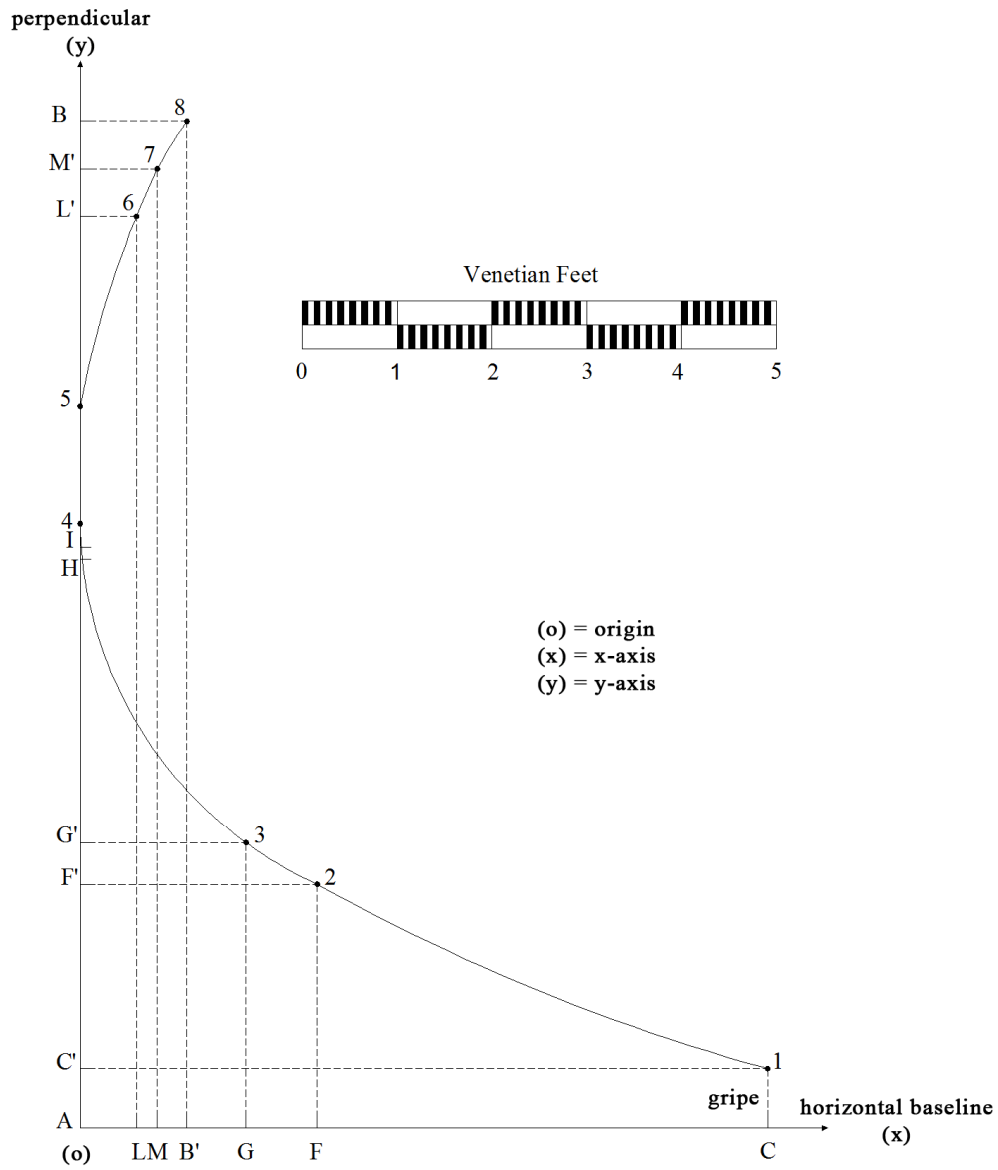


Fig. 7. Reconstruction of the sternpost based on folio 6r of *Misure di vascelli etc. di...proto dell'Arsenale di Venetia*. Drawing: L. Campana.



## Stem

Following the same procedure mentioned for the sternpost, a reconstruction of the stem for the *galea da 5* is proposed below. The text of folios 6r-v recording the measurements of the stem is shown on Table 3.

Based on the measurements provided for the stem, however, the location of point 3 obtained by the intersection of lines A-E and A-E' is clearly incorrect (fig. 8).

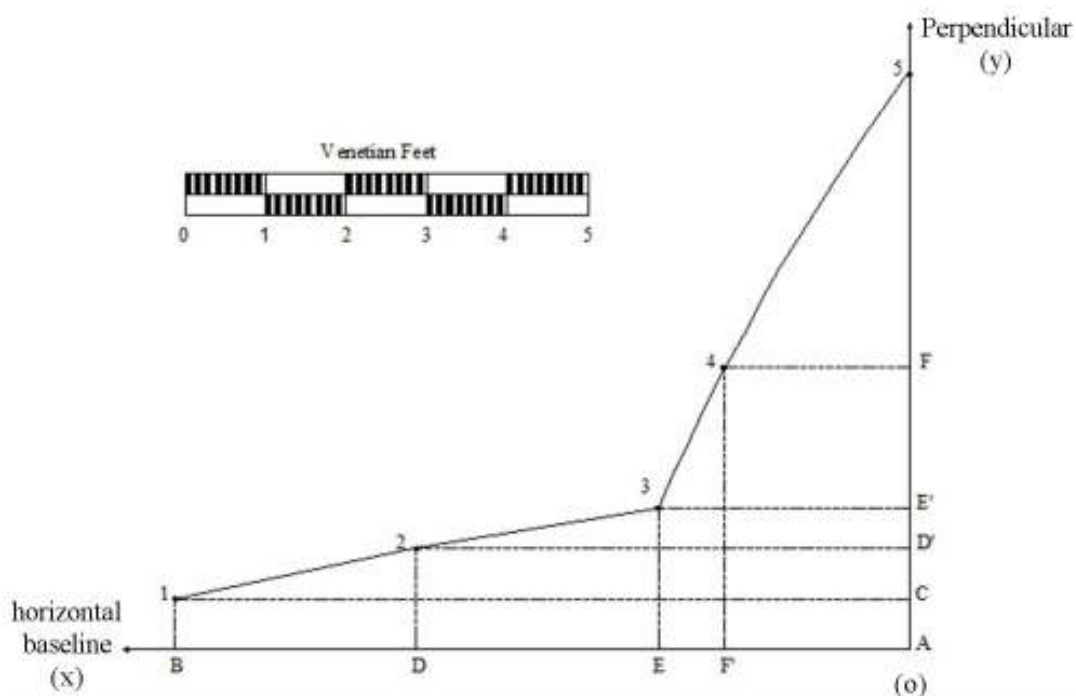


Fig. 8. Reconstruction of the stem of the *galea da 5* based on folio 6r-v of *Misure di vascelli etc. di...proto dell'Arsenale di Venetia*. Drawing: L. Campana.

The irregular profile of the stem suggests a copying error in the measurement of point 3. This is most likely due to an error by the copyist. After several trials, it became apparent that A-E' was incorrect and could not have been measured only 1 feet and 12

fingers, as recorded by the copyist. By simply adding 1 foot to the previous measurement, a more plausible and smooth profile for the stem is obtained (fig. 9)

Table 3. Offset measurements of the stem (fol. 6r-v).

	Transcription	Translation	Offset Distances		Point
			Vertical (y)	Horizontal (x)	
RAKE OF STEM	Slanzo dell'hasta da prova pie 9 deda 2	The rake of the stem is 9 feet and 2 fingers	---	A-B	---
HEIGHT OF STEM	Alta pie 7 deda 2	The height [of the stem] is 7 feet and 2 fingers	A-5	---	5
	Alza al poselese del calcagnol deda 10	At the point where the keel begins to rise, the gripe is 10 fingers high	A-C	---	1
	Agno pie 3 dal poselese	At 3 feet from the point [of the gripe]	---	B-D	2
	Alza l'hasta pie uno deda 4	Measure 1 foot and 4 fingers in height	A-D'	---	
	In cao de pie 6	Measure 6 feet [along the baseline]	---	B-E	3
	Alza l'hasta pie 1 deda 12	Measure 1 foot and 12 fingers in height	A-E'	---	
	In alteza de pie 3 ½	Measure 3 ½ in height	A-F	---	4
	Dalla ligna all'hasta pie do de' 5	From the perpendicular to the stem is 2 feet and 5 fingers	---	A-F'	

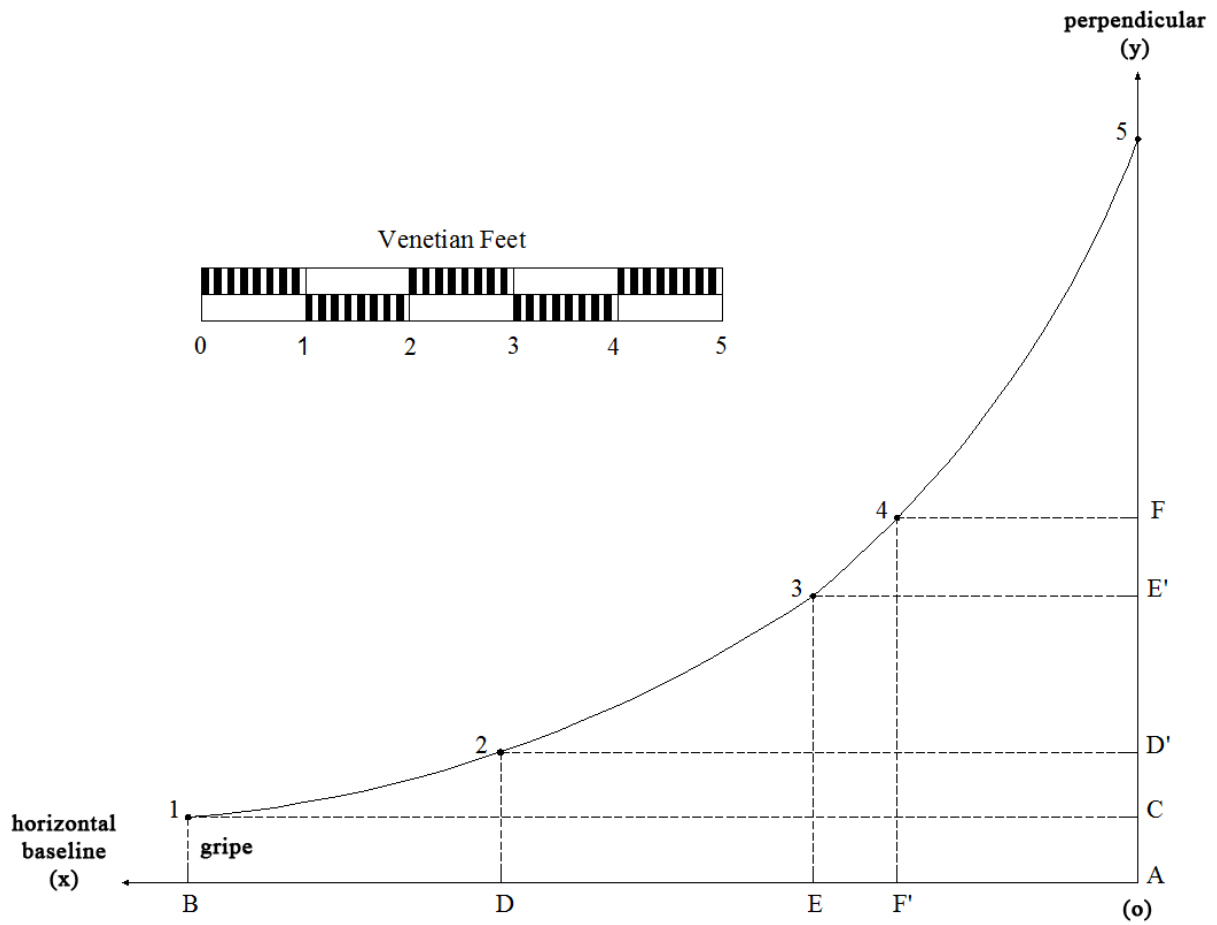


Fig. 9. Modified reconstruction of the stem of the *galea da 5* based on folio 6r-v of *Misure di vascelli etc. di...proto dell'Arsenale di Venetia*. Drawing: L. Campana.

### Midship Frame

A reconstruction of the midship frame of the *galea da 5* is shown in figure 10.

The original text is tabulated in Table 4 showing each measurement in the original text and its corresponding translation. This section also suggests a step-by-step procedure used in designing the midship frame of the ship (fig. 11.1-9).

Table 4. Offset measurements of the midship frame (fol. 6v).

Transcription	Translation	Calculations	Offset	Points
El suo costado in squara la mita del sestio	[The measurements] of one half of a frame in square	---	---	---
In pontal pie 6 deda 1	The depth in the hold is 6 feet and 1 finger.	6 feet $\times$ 34.7735 cm = 208.6410 cm 1 finger $\times$ 2.1733 cm = 2.1733 cm 208.6410 + 2.1733 = <b>210.8143 cm</b>	F-4	---
In bocca pie 8 dea 9	The maximum bream [of the ship] is 8 feet and 9 fingers	8 feet $\times$ 34.7735 cm = 278.1880 cm 9 fingers $\times$ 2.1733 cm = 19.5597 cm 278.1880 + 19.5597 = <b>297.7477 cm</b>	4-C	---
Dalla mezzaria al poselese pie 4 ½ bon	[Measure] 4 ½ feet from the center line to the turn of the bildge	4 ½ feet $\times$ 34.7735 cm = <b>156.4771 cm</b>	F-M	3
Alza el sestio al poselese dea 5 buoni	Move the mold up from this point of a good 5 fingers	5 fingers $\times$ 2.1733 cm = <b>10.8665 cm</b>	F-N	
Partison longa pie 3 dea 2 ½ da poppe	The narrowing at the stern is 3 feet and 2 ½ fingers	3 feet $\times$ 34.7735 cm = 104.3205 cm 2 ½ fingers $\times$ 2.1733 cm = 5.4332 cm 104.3205 + 5.4332 = <b>109.7538 cm</b>	F-L	---
da prova pie 3	The narrowing at the bow is 3 feet	3 feet $\times$ 34.7735 cm = <b>104.3205 cm</b>	F-O	---

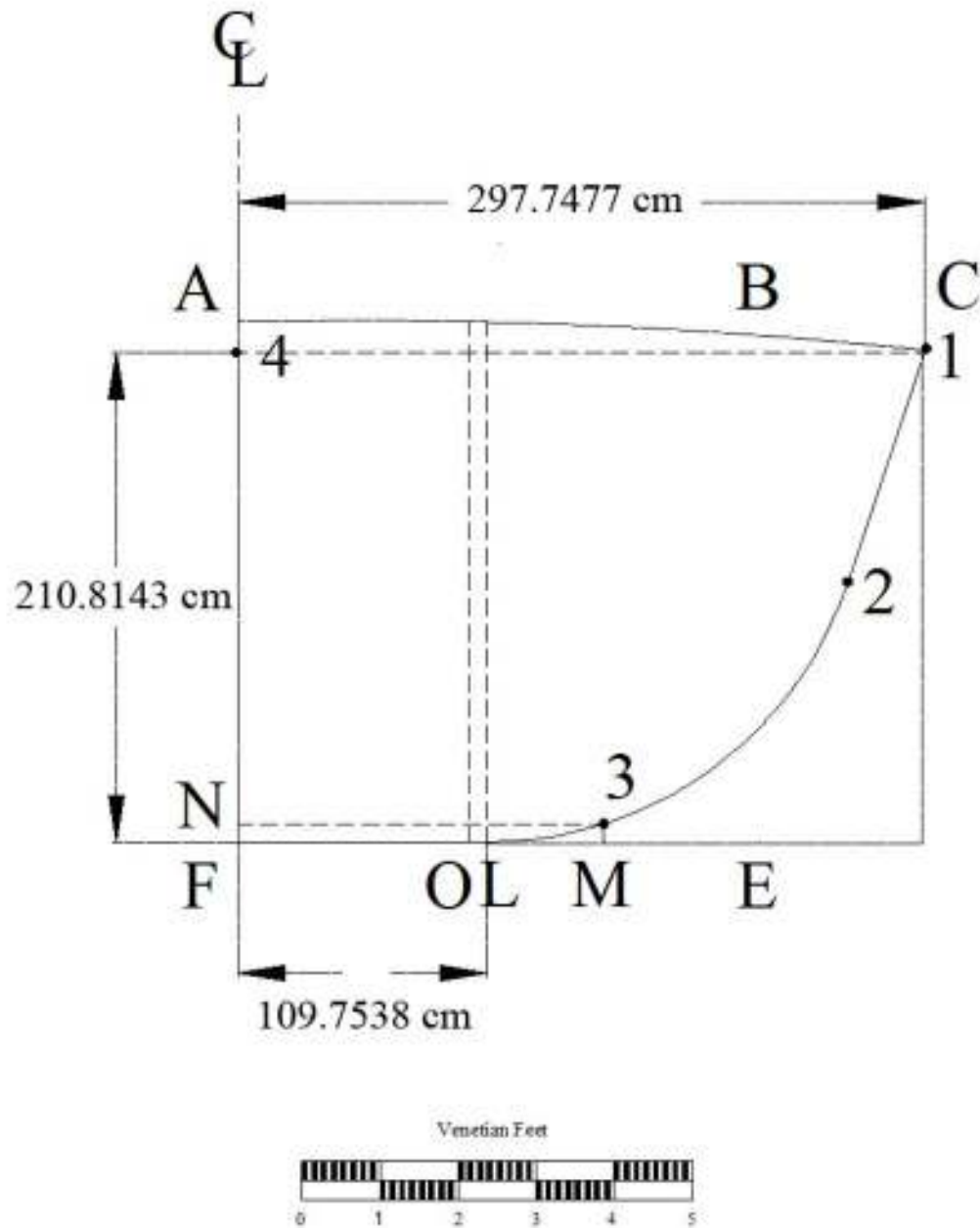


Fig. 10. Reconstruction of the midship frame based on folio 6v of *Misure di vascelli etc. di...proto dell'Arsenale di Venetia*. Drawing: L. Campana

Suggested sequence for designing the midship frame. Drawing: L. Campana.

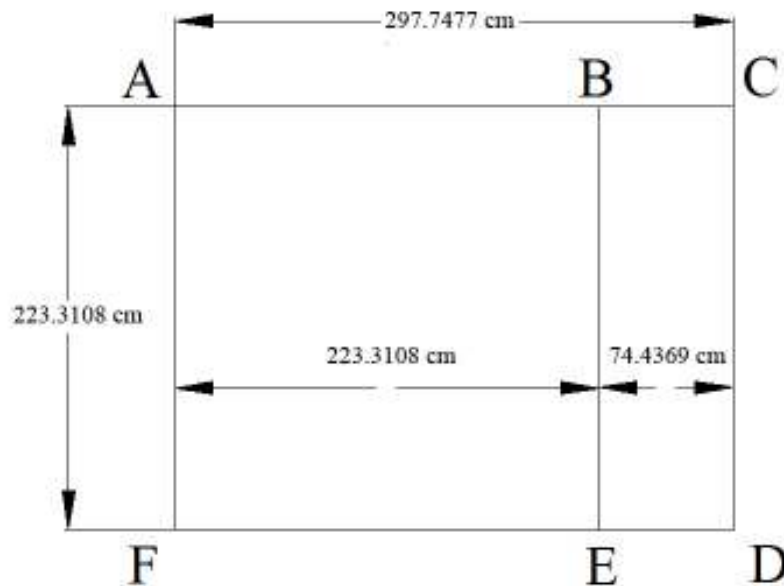


Fig. 11. Suggested sequence for designing the midship frame, step 1.

- 1) Construct a rectangle representing the maximum half-breadth (A-C and F-D) of the hull, and the height at half-breadth (C-D and A-F) equal to  $\frac{3}{4}$  of the maximum half-breadth (fig. 11).

$$\begin{aligned} A-C = F-D &= 8 \text{ feet and } 9 \text{ fingers} \\ &= (34.7735 \text{ cm/feet} \times 8 \text{ feet}) + (2.1733 \text{ cm/fingers} \times 9 \text{ fingers}) \\ &= 278.1880 \text{ cm} + 19.5597 \text{ cm} = 297.7477 \text{ cm} \end{aligned}$$

and

$$A-F = C-D = \frac{3}{4} \times 297.7477 \text{ cm} = 223.3108 \text{ cm}$$

- 2) Divide the rectangle by perpendicular line B-E so that B-C (= E-D) is equal to  $\frac{1}{4}$  of the maximum beam A-C (= F-D)

$$\frac{1}{4} \times 297.7477 \text{ cm} = 74.4369 \text{ cm}$$

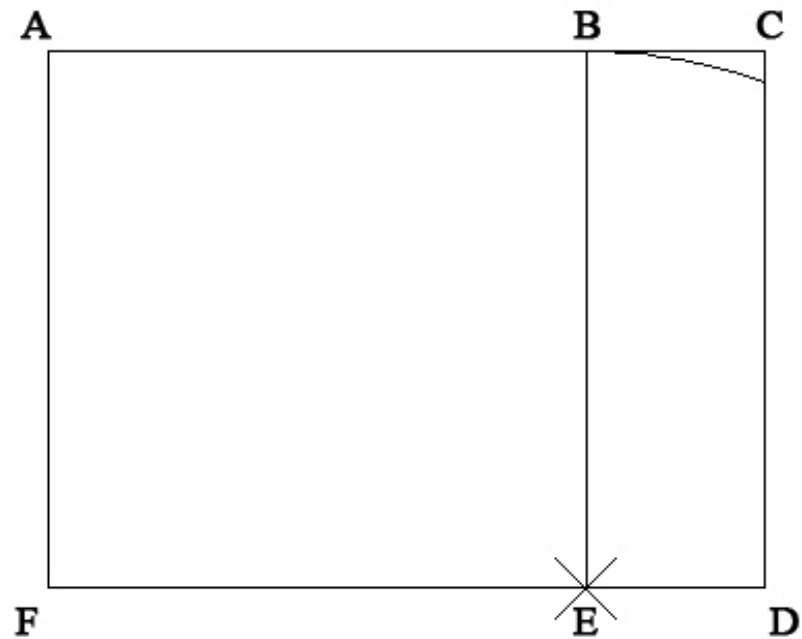


Fig. 12. Suggested sequence for designing the midship frame, step 2.

- 3) Draw an arc of a circle with its center at E and its radius equal to  $B-E$  ( $= E-F$ ), so that it intersects line C-D (fig. 12).

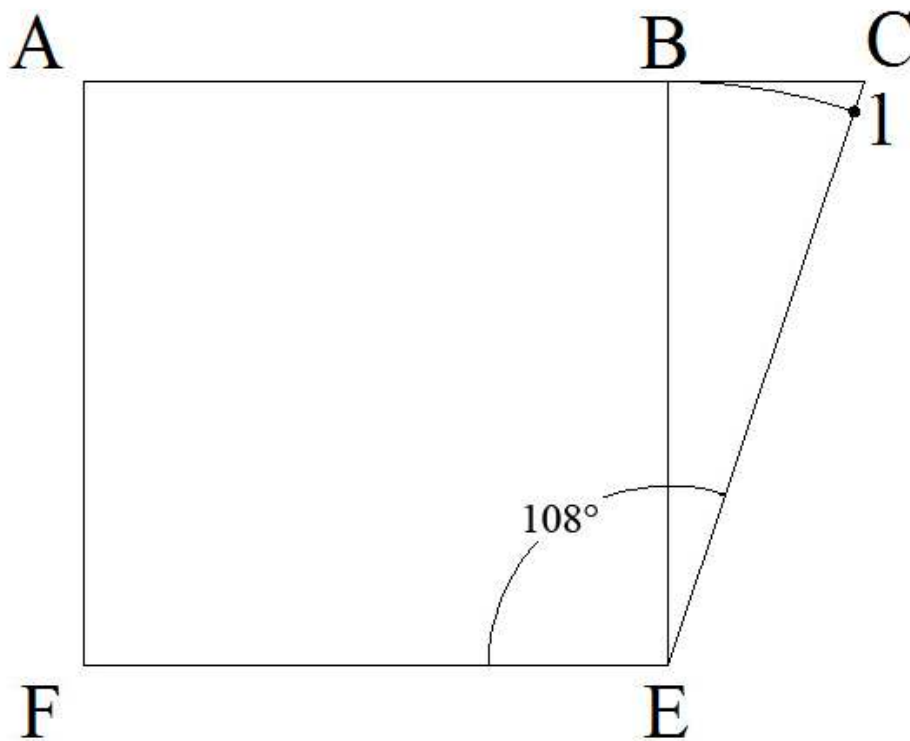


Fig. 13. Suggested sequence for designing the midship frame, step 3.

4) Draw a diagonal from E to C to obtain point 1 at the intersection of diagonal E-C with circle arc (fig. 13).

5) Note that angle  $\hat{F}EC$  is  $108^\circ$  (fig. 13).



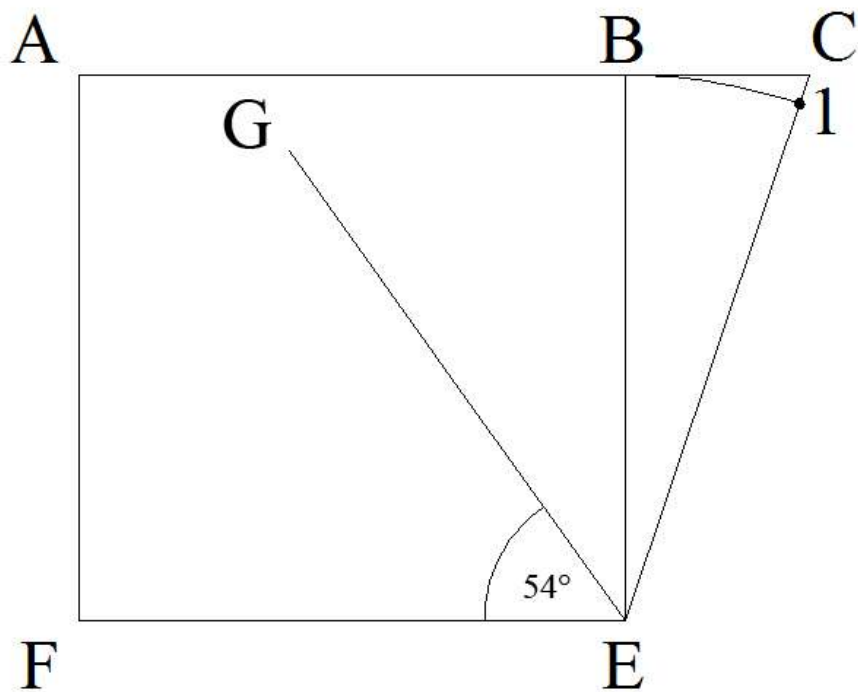


Fig. 14. Suggested sequence for designing the midship frame, step 4.

6) Bisect angle  $F\hat{E}C$  ( $180^\circ$ ) with line E-G to obtain angle  $F\hat{E}G$  ( $54^\circ$ ) (fig. 14).

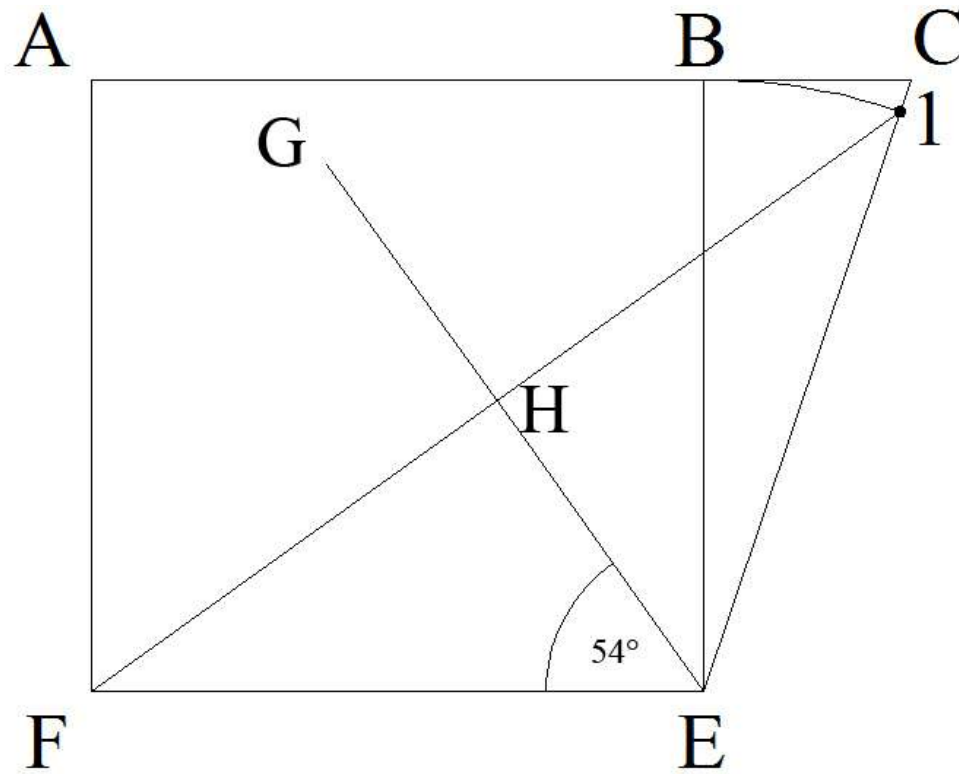


Fig. 15. Suggested sequence for designing the midship frame, step 5.

7) Draw a line from F to 1, so that F1 intersect E-G at H (fig. 15).

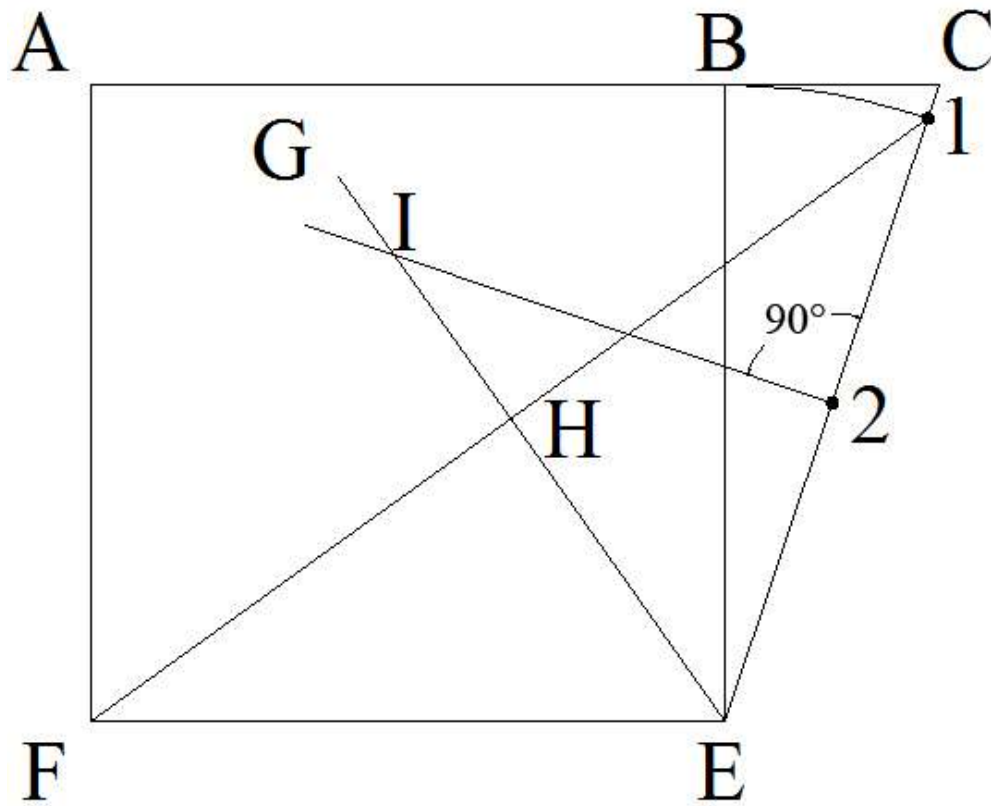


Fig. 16. Suggested sequence for designing the midship frame, step 6.

8) Draw a perpendicular bisector for E-C at 2 so that it intersects E-G at I (fig. 16).





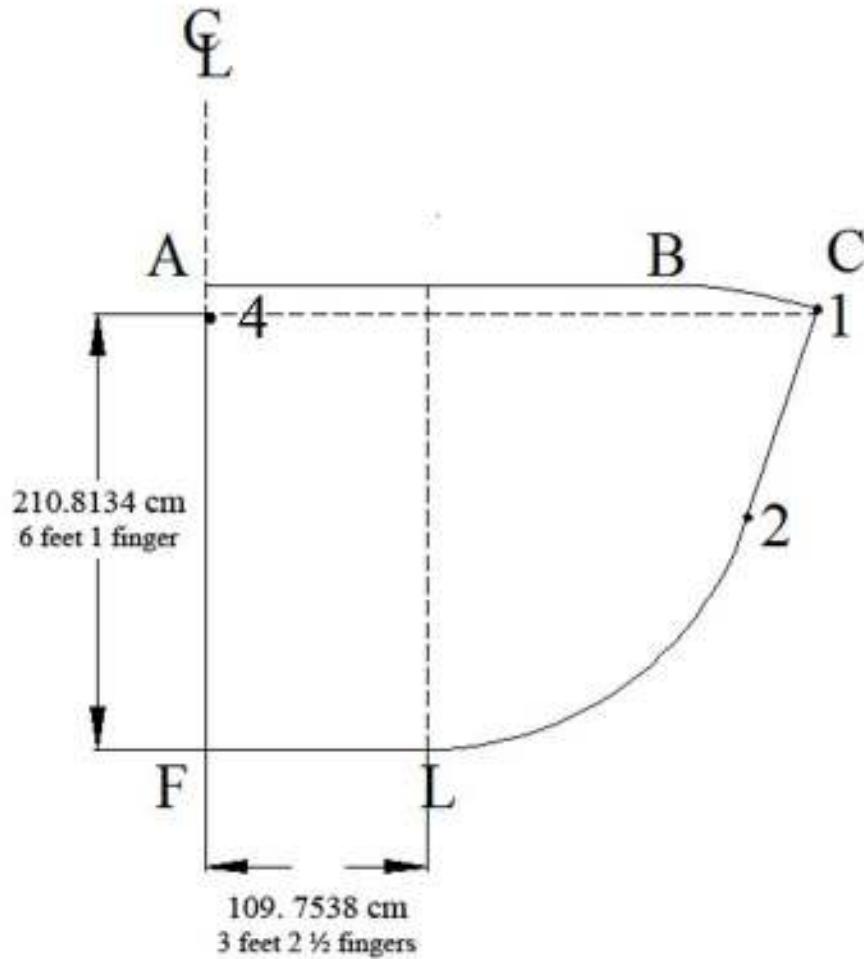


Fig. 19. Suggested sequence for designing the midship frame, step 9.

11) Removing construction lines to obtain half of the midship frame (fig. 19).

Points F, L, 2, and 1 form the profile of the midship frame.

F-L is the midship flat (*partison del fondo di poppa*) corresponding to 3 feet and 2 ½ fingers (109.7538 cm) as specified in the manuscript.

F-4 is the depth in the hold (*pontal*) corresponding to 6 feet and 1 finger (210.8134 cm) as specified in the manuscript.

### Construction of the Mold

Based on the measurements provided by folios 6v, a suggested construction of the mold (*sesto*) of the *galea da 5* is shown in figure 20. The mold is moved in the direction of the arrow by the increment for each successive station (floor location) resulting in the narrowing of the floors toward either end (*cai de sesto*) of the hull from amidships.

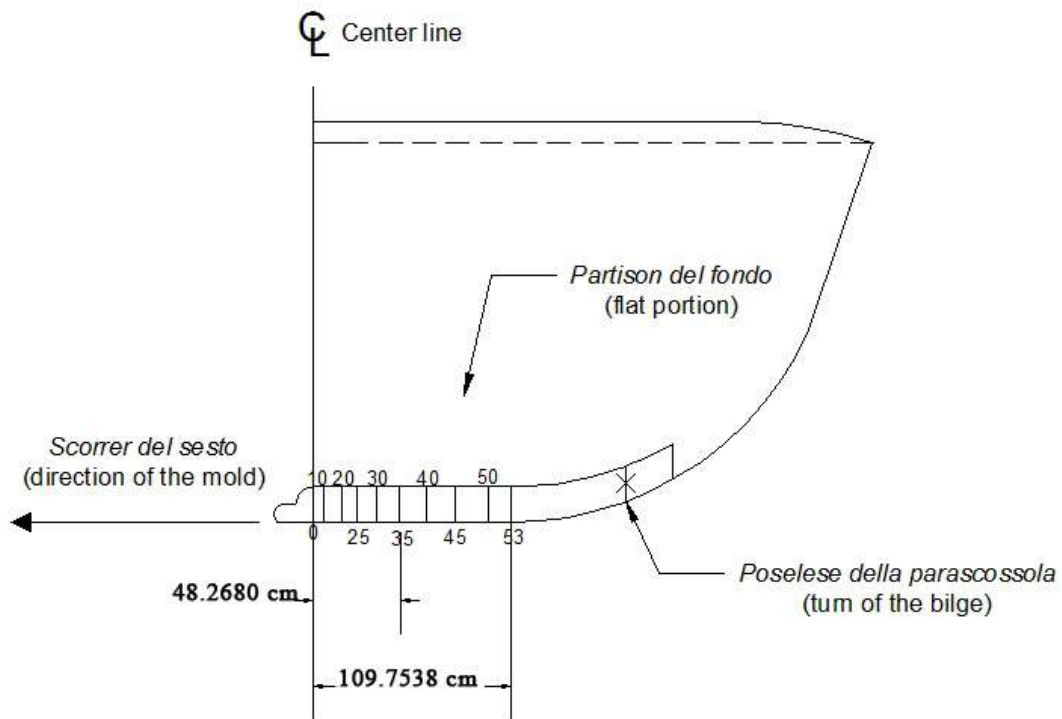


Fig. 20. Construction of the mold for the *galea da 5*.

The manuscript notes that the narrowed length of the flat portion of the designed frame's floor is 3 feet and 2 ½ fingers, corresponding to 109.7538 cm. The *partison*, or

portion of the hull consisting of frames that are narrowed and/or raised by means of geometrical methods, totals 53 stations, or frame locations, in the *galea da 5*.

Thus, the increment of each mark on the mold can be easily calculated using Gauss' formula:

$$\Sigma = n \times \frac{n + 1}{2}$$

$$\Sigma = 53 \times \frac{53 + 1}{2}$$

$$\Sigma = 53 \times 27 = 1431$$

The mold, therefore, consists of 1431 increments.

By dividing 1431 by the total narrowed length of the flat portion of the designed frame's floor (109.7538 cm), the exact length each increment is obtained:

$$109.75 \text{ cm} \div 1431 = 0.0766 \text{ cm}$$

For example, the narrowed length of the floor flat at the 35<sup>th</sup> station toward the stern is 48.2580 cm (fig. 20) obtained as follows:

$$\Sigma = 35 \times \frac{35 + 1}{2}$$



$$\Sigma = 35 \times 18 = 630$$

$$0.0766 \text{ cm} \times 630 = 48.2580 \text{ cm}$$

### Sheer Plan

Based on the measurements provided by folios 5r-v, a suggested reconstruction of the sheer plan is shown in figure 21. The original text and corresponding translations and calculations are tabulated on Table 5.

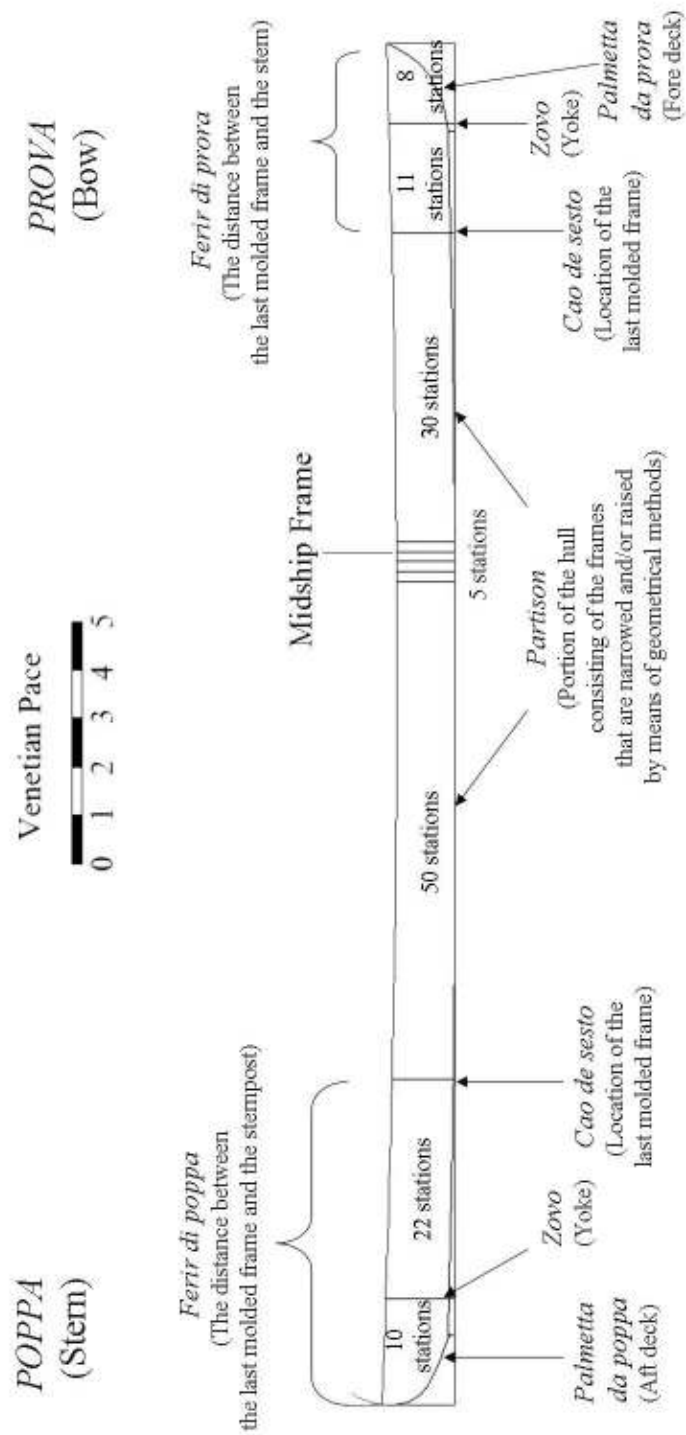


Fig. 21. Reconstruction of the sheer plan of the *galea da 5* based on folio 5r-v of *Misure di vascelli etc. di...proto dell'Arsenale di Venetia*.

Drawing: L. Campana.

Table 5. Offset measurements of the sheer plan of the *galea da 5* (fol. 5r-v).

		<b>Transcription</b>	<b>Translation</b>	<b>Calculations</b>	<b>Stations</b>
Lenght over all		Longa passa 28 deda 4 ½ dentro dalle haste	(The galley) is 28 paces and 4 ½ fingers long measuring between the posts	---	---
<i>Campi Stations</i>	Total	Mo' a deda 16 ½ ha campi 136 con do mezzi	Now, if each station is 16 ½ fingers, there are 136 stations and 2 ½	Fingers = 28 × 5 = 140 Fingers = 140 × 16 = 2,250 2,240 + 4 ½ = 2,244 ½ Stations = 2,244 ½ ÷ 16 ½ = <b>136.03</b>	136
	Frame in the mid- portion	In mezzo campi 5, pie' 5 deda 2 ½	In the middle portion, there are 5 stations [for a total of] 5 feet and 2 ½ fingers	Fingers = 5 × 16 = 80 80 + 2 ½ = 82 ½ Stations = 82 ½ ÷ 16 ½ = <b>5</b>	5
	<i>Partison (total)</i>	Sono 85, che fanno passa 17 deda 42 ½	There are 85 stations [for a total of] 17 paces and 42 ½ fingers	Feet = 17 × 5 = 85 Fingers = 85 × 16 = 1,360 1,360 + 42 ½ = 1,402 ½ Stations = 1,402 ½ ÷ 16 ½ = <b>85</b>	85
	<i>Partison da prova (toward the bow)</i>	In partison da prova deda campi 30, sono pie' 30 deda 15	In the portion of the hull comprising the molded frames toward the bow there are 30 stations [for a total of] 30 feet and 15 fingers	Fingers = 30 × 16 = 480 480 + 15 = 495 Stations = 495 ÷ 16 ½ = <b>30</b>	30
	<i>Partison da poppe (toward the stern)</i>	In partison da poppe campi 50, sono pie' 51 and deda 9	In the portion of the hull comprising the molded frames toward the stern there are 50 stations, (that is) 51 feet and 9 fingers	Fingers = 51 × 16 = 816 816 + 9 = 825 Stations = 825 ÷ 16 ½ = <b>50</b>	50
	<i>Ferir da prova</i>	In ferir a prova pie' 19 deda 11	The distance between the last molded forward frame and the stem is 19 feet and 4 fingers	Fingers = 19 × 16 = 304 304 + 11 = 315 Stations = 315 ÷ 16 ½ = <b>19.09</b>	19

Table 5. Continued.

		<b>Transcription</b>	<b>Translation</b>	<b>Calculations</b>	<b>Stations</b>
<i>Campi Stations</i>	<i>Ferir da poppe</i>	In ferir da poppa pie' 33 deda 8 ½	The distance between the last molded after frame and the sternpost is 33 feet and 8 ½ fingers	Fingers = $33 \times 16 = 528$ $528 + 8 \frac{1}{2} = 536 \frac{1}{2}$ Stations = $536 \frac{1}{2} \div 16 \frac{1}{2} =$ <b>32.51</b>	32
	<i>Palmetta da prova</i>	In palmete a prova pie' 8 deda 5 ½	The distance between the forward yoke and the stem is 8 feet and 5 ½ fingers	Fingers = $8 \times 16 = 128$ $128 + 5 \frac{1}{2} = 133 \frac{1}{2}$ Stations = $133 \frac{1}{2} \div 16 \frac{1}{2} =$ <b>8.09</b>	8
	<i>Palmetta da poppe</i>	Palmetta a poppe pie' 10 deda 13 ½	The distance between the after yoke and the sternpost is 10 feet and 13 ½ fingers	Fingers = $10 \times 16 = 160$ $160 + 13 \frac{1}{2} = 173 \frac{1}{2}$ Stations = $173 \frac{1}{2} \div 16 \frac{1}{2} =$ <b>10.51</b>	10
	<i>Cao de sesto al zovo da prova</i>	Le late dal cao de sesto al zovo da prova campi 11	The distance between the last molded forward frame and the forward yoke is 11 stations	Feet and fingers = $11 \times 16 \frac{1}{2} = 181 \frac{1}{2}$ $181 \frac{1}{2} \div 16 = 11.34375 =$ <b>11 feet and 5 ½ fingers</b>	11
	<i>Cao de sesto al zovo (poppa)</i>	(Le late dal cao de sesto al zovo) a poppe (campi) 22	The distance between the last molded after frame and the after yoke is 22 stations	Feet and fingers = $22 \times 16 \frac{1}{2} = 363$ $363 \div 16 = 22.6875 =$ <b>22 fingers and 11 fingers</b>	22

## **An Interpretative Hypothesis of the Anonymous 16<sup>th</sup>-century Venetian**

### **Shipbuilding Manuscript *Misure di vascelli etc. di...proto dell'Arsenale di Venetia***

The author of *Misure di vascelli etc. di...proto dell'Arsenale di Venetia* remains unknown, although it is certain that he was a master shipbuilder who worked in the service of the Arsenal of Venice during the mid-16<sup>th</sup> century. Tucci proposed some interesting views about authorship, which, however, must now be disregarded based on new information that came to light while conducting research for the present study. The identification of the manuscript's author is not a simple task, given the fact that, from the study of Venetian Renaissance shipbuilding manuscripts, it seems clear that all the shipwrights considered themselves beholders of the *secrets du métier* for building *the* perfect galley. As Alberto Tenenti noted, "...inside the wall of the Arsenal, all the master shipbuilders engaged in competition [to build the best galley] and to gain some rewards from the State; in order to design galleys, each shipwright employed his own mold, which had to remain secret and should not be revealed."<sup>499</sup>

During the 15<sup>th</sup> and the 16<sup>th</sup> centuries, the Venetian government and the Arsenal promoted new designs for building galleys in order to maintain (and later to reaffirm) the Republic's supremacy at sea. It is not uncommon to read, in the documents preserved at the State Archive of Venice, many decrees promulgated by the *Senato mar* – the office in charge of the naval affairs – that provided incentives and authorized the construction

---

<sup>499</sup> Tenenti 1962, 31: *A l'intérieur de l'Arsenal plusieurs maîtres se disputaient les commandes de l'État et les récompenses qui y étaient attachées : chacun construisait d'après le modèle de son invention, qui demeurait secret et ne se transmettaient pas, en principe.*

of ships based on new designs.<sup>500</sup> Toward the end of the 16<sup>th</sup> century, however, the *proto* Baldissera Quintio Drachio on more than one occasion voiced his disapproval of the custom of building galleys according to different designs because it generated confusion and resulted in imperfect ships.<sup>501</sup> Drachio proposed to standardize the galleys to one design. However, his attempt at reorganizing the Arsenal ended abruptly one night when he was assaulted and beaten by an unidentified group of men. Eventually, Drachio was forced to abandon the Arsenal.<sup>502</sup>

Returning to the initial question about the authorship of the *Misure di vascelli*, it is necessary to examine the earliest date provided by the manuscript, 25 April 1530. On the very same day, the Proveditors and the Superintendents of the Arsenal authorized the construction of five new great galleys, each one to be built by a different master shipbuilder who had to design their respective galleys by using “their own mold.”<sup>503</sup> At that time in the Arsenal there were only the *proto* Lunardo Bressan, and four foreman shipwrights capable of building great galleys: Ieronimo Rosso, Francesco de Todarin Zoto, Vincenzo Vitturi, and Vettor Fausto.

As already suggested by Tucci, the author of *Misure di vascelli* must be identified with one of the above five master shipbuilders. Tucci concluded, however, that “...both Bressan and Fausto have to be excluded as authors of the manuscript *Misure di*

---

<sup>500</sup> See, for example, ASVe, Senato mar, reg. 14, fol. 141r, and fol. 48r (Leonardo Bressan built a *barza*); ASVe, Senato mar, reg. 21, fol. 160r (Leonardo Bressan built a *barza* larger than the usual size, which made it necessary to break the Arsenal wall to get it out); ASVe, Patroni e Provveditori all’Arsenal, env. 133, fol. 107r (Fausto was authorized to build a great galley of his own design).

<sup>501</sup> ASVe, Patroni e Provveditori all’Arsenal, env. 533 (*Ricordi intorno la casa dell’Arsenal*); ASVe, Archivio Proprio Contarini, env. 25 (*Visione di Baldissera Quintio Drachio*). Translated by Th. Lehmann.

<sup>502</sup> Lehmann 1992, 1.

<sup>503</sup> ASVe, Patroni e Provveditori all’Arsenal, env. 133, fol. 107r. It should be noted that Vettor Fausto was never a foreman shipwright (*capo cantiere*), as he was never formally hired by the Arsenal.

*vascelli*. For the remaining [foreman shipwrights] – namely Ieronimo Rosso, Francesco de Todarin Zoto, and Vincenzo Vitturi – no documents have surfaced so far revealing which of them was the author of the manuscript.”<sup>504</sup>

It is further necessary to consider the second date provided by the manuscript, 1 April 1546, which accompanied the description and instructions to build a galleon. Fausto had died just a few months earlier. A document from the State Archive of Venice, dated to 18 January 1546, records that “...the famous *dominus* Vettor Fausto recently died without leaving any heirs.”<sup>505</sup> Therefore, Fausto’s sister, Apollonia, claimed his possessions.

An extremely important piece of information provided by documents in the State archive of Venice is that Fausto, before dying, had just begun building a galleon, which was left unfinished in the Arsenal.<sup>506</sup> A senatorial decree of 22 October 1547, about one year after Fausto’s death, decided that:

Since the galleon has always given prestige to Our Signory against enemies, and since it is finished up to the first deck, in order to launch it, we have to provide for it. Therefore, according to the opinion of the master shipbuilders of our

---

<sup>504</sup> Tucci 1964, 281: *Esclusi il Bressan e il Fausto, il probabile autore di queste ‘Misure di vascelli’ resta, così, incerto tra Francesco de Todarin, Ieronimo Rosso, Vincenzo Vitturi, e non ci sembra che possano invocarsi argomenti in favore dell’uno o dell’altro.*

<sup>505</sup> ASVe, Collegio, Notatorio, reg. 26, fol. 51r.

<sup>506</sup> Fausto also built a “small galleon” and another “huge galleon” in the 1550s. The first one was launched in 1542 – and not in 1544 as stated by Concina (1990, 121) – since the Senate, on 13 May 1542, planned to use it against the Uskoks in Dalmatia, but then dismissed the idea (ASVe, Senato mar, reg. 26, fol. 100r). The “huge galleon” (*il galion grande*) was launched on 11 December 1558, but sank the same day just as it reached Malamocco, for the ship’s heavy artillery shifted to one side causing the ship to take in water from the gunports (ASVe, Maggior Consiglio, Deliberazioni, reg. 28, fol. 77r). The salvage operations lasted about two months (ASVe, Senato mar, reg. 35, fol. 15r, and fols. 35v-36r). As noted by Aymard (1991, 263-7), during the 16<sup>th</sup> century, the Arsenal commissioned the construction of several galleons and heavy ships, such as the *barze* built by Leonardo Bressan, and the first galleon ever built in the Arsenal (1526-30) by Matteo Bressan.

Arsenal, we have to complete it, also because we have already established by the senatorial decree dated to last November that [the galleon] should be removed from the water and put back on the dockyard. It is established now that the Patrons and Proveditors of this Arsenal have to dismantle a portion of the wall of the Arsenal *Novissimo* toward Murano, so that the galleon could enter the Arsenal and be placed in a dried ship-shed. The galleon has to be put on the stocks, and the shipwrights with the master shipbuilders have to complete it according to its mold and measurements, without modifying its proportions.<sup>507</sup>

Remarkably, the Senate also decreed that “...the experts have to diligently record the measurements and the mold (*sesto*) of the galleon,”<sup>508</sup> which are, in all likelihood, those that are recorded in the manuscript *Misure di vascelli* in folios 17r-19r.

Thus, Fausto’s galleon was completed. Much later, on 30 December 1564, the Senate established to arm and to outfit the vessel:

In the Arsenal, there is the galleon that was built years ago by our faithful Vettor Fausto, whose knowledge and expertise on naval architecture was acknowledged by the Council. The said

---

<sup>507</sup> ASVe, Senato mar, reg. 29, fol. 125r: *Havendosi la Signoria Nostra in ogni sorte de tempi servito del galione con molta reputation appresso di cadauno, et essendo quello stà disfatto fino sopra la prima coperta, per esser fatto navigabile, è a proposito delle cose nostre dover far provisione, che per beneficio publico el sia revocato, come consigliano li prothi nostri all’arsenal, che commodamente si possi fare, essendo anco presi sotto di cinque novembre passato chel sii turrato in terra. Però l’anderà parte, che per autorità di questo consiglio sii imposto alli proveditori er patroni all’arsenal che debbi far apprir tanto della muraglia dell’arsenal novissimo che è’ verso Murano quanto possi capir, et ricever dentro il detto galione, il qual per loro sia fatto turrar in terra dentro l’arsenal predetto, et sia fatto poner sopra i vasi, et sia pontato, pesandolo nella mezzaria er facendolo da corba a corba su le misure et sesto di quello cavate, restar da quelli prothi et maestri, che a loro parerano esser sufficienti, liquali non debbino azonzer ne sminuir le misure et sesto.* Pantera Pantero (1614, 40-3) says that Fausto’s galleon was 12,000 *salme*, that is to say, about 2,000 tons. From an earlier document, dated to 5 November 1546, we learn that Fausto’s galleon had been built in Poveglia, a small island between Venice and Lido, and that it was rotting (ASVe, Senato mar, reg. 29, fol. 18v).

<sup>508</sup> ASVe, Senato mar, reg. 29, reg. 125v: *Far tuor da periti diligentemente le misure et il sesto di esso galione.*



galleon, once armed, caulked, outfitted, and rigged with sails, which have to be cut so that they can be rigged either as lateen sails and square sails, could be of great service to our State. Also the Proveditors and the Patrons of the Arsenal, and the master shipbuilders as well, agreed with us [...] Therefore, it is established that, following the authority of this Council, the Proveditors and the Patrons of the Arsenal have to arm and outfit the galleon so that Our Signory can make use of it if needed.<sup>509</sup>

Apparently, six years passed before the galleon could be armed and outfitted. On 25 April 1570, the two Proveditors of the Arsenal, Giacomo Marcello and Paolo Trun, and the three Patrons, Nicolò Donado, Antonio Moro, and Lorenzo Pisani, “...deliberated about the galleon that [had been built] by Vettor Fausto, since it has to be launched as soon as possible, so that it can serve in the present war.”<sup>510</sup> There is no doubt that the Republic of Venice was organizing its naval fleet for the Battle of Lepanto, fought shortly after the decree, on 12 October 1571. However, due to the deterioration since its construction, upon the judgment of the master shipbuilders, the Proveditors and the Patrons of the Arsenal unanimously decided to reinforce the

---

<sup>509</sup> ASVe, Senato mar, reg. 36, fol. 193v: *Si ritrova nella casa nostra dell'arsenal un galeone, che gia alcuni anni fu fabricato dal quondam fidel nostro Vettor Fausto, che fu di quella peritia nelle cose d'esso arsenal, che è ben nota a questo consiglio, il qual galeone, quando fusse fornito delli suoi morsi et di calafado, oltra delli armizi, et delle vele, che deveno esser fatte, si che potranno servire alla latina, et alla quadra, potrebbe in ogni occorrenza apportar grandissimo beneficio, et utile alle cose nostre, il che anche affirmano li Proveditori et Patroni nostri all'arsenal, et li prothi di quello [...] L'anderà parte, che per autorità di questo consiglio sia commesso alli Proveditori et Patroni nostri all'arsenal, che debbano far finire il detto galeone di tutte le cose, che fussero necessarie, si che in ogni occorrenza la Signoria Nostra potesse valersene nelli sui bisogni.* On the raw materials employed in the Arsenal of Venice for shipbuilding and fitting, see: Vergani 1991, 285-312.

<sup>510</sup> ASVe, Patroni e Proveditori all'Arsenal, env. 136, fol. 94v: *Dovendosi deliberar quello che si deve per la presta ispeditione del galion del quondam Ser Vettor Fausto, si che quanto prima si possa butar in acqua, per servirsi in quest'occasione di guerra.*

sternpost of Fausto's galleon. They assigned the task to Giovanni Maria di Zanetto, known also as Zulle.<sup>511</sup>

Zulle, who had been carpenter (*marangon*) and attendant to the master shipbuilder (*sotto protho*), was elected *proto* on 16 December 1568 by the three Patrons and Proveditors of the Arsenal: Nicolò Donado, Nicolò Suriano, and Gerolamo Contarini.<sup>512</sup> Upon Francesco Bressan's death, Zulle succeeded him as master shipbuilder at the Arsenal.<sup>513</sup> In a document dated to 1593, Zulle, during an inquiry conducted by the Arsenal about mechanical problems of the rowing system of galleasses, prided himself in being the apprentice of Vettor Fausto. Zulle explicitly stated that Fausto had taught him his shipbuilding principles for galleys (*el suo insegnar una come sel fabrica*).<sup>514</sup> Thus, it seems likely that Zulle can now be identified as the author of the manuscript *Misure di vascelli etc. di...proto dell'Arsenale*, and the ships recorded are likely to be those that had been built by Fausto, including light galleys, during the years Fausto spent in the Arsenal.<sup>515</sup>

Unfortunately, none of the technical drawings and Fausto's notes, which must have been preserved in the Archive of the Naval Museum in Venice, survived. Besides

---

<sup>511</sup> ASVe, Patroni e Provveditori all'Arsenal, env. 136, fol. 94v.

<sup>512</sup> ASVe, Patroni e Provveditori all'Arsenal, env. 136, fol. 68v and fol. 93v. See also: ASVe, Senato mar, reg. 36, fol. 72v, dated 23 August 1563, where Zulle is said to be vice master shipbuilder (*sotto protho*).

<sup>513</sup> ASVe, Senato mar, reg. 34, fol. 114r; ASVe, Senato mar, reg. 36, fol. 72r.

<sup>514</sup> ASVe, Patroni e Provveditori all'Arsenale, env. 1, fol. 11r. The document is briefly cited by Tucci (1964, 281), who, however, failed to identify Zulle's authorship.

<sup>515</sup> Fausto started designing light galleys toward the end of his life. By 1544, his light galleys were much in demand by the Venetian sea captains for their seaworthiness (ASVe, Patroni e Provveditori all'Arsenale, env. 135, fol. 73r). The sea captain Cristoforo da Canal said that "...the [light] galleys built by Fausto were the best to have ever been built in the Arsenal..." and that "...the proportions of Fausto's [light] galleys are perfect so that its shape narrows gracefully." Cristoforo da Canale provided a lengthy description of Fausto's trireme; in Nani Mocenigo 1930, 65-6.

the sources discussed in the previous chapter, which provide general information about rowing arrangements of galleys, *Misure di vascelli etc. di...proto dell'Arsenale* is the *only* technical manuscript with detailed records of Fausto's shipbuilding instructions. The manuscript is all the more valuable, considering that Fausto was extremely jealous of his technological innovations and he kept his shipbuilding *ratio* secret. The quinquereme was built in a *volto serrato*, a locked ship-shed that permitted entrance only to the shipwrights selected to build the quinquereme.<sup>516</sup> Also, Fausto requested of the humanists and scholars with whom he discussed the technical aspects of his shipbuilding *ratio* not to spread this information. Giovanni Musler from Oettingen, for example, who met Fausto in 1536 during his law studies at the University of Padua, said, "...all the information about the art of shipbuilding that has been conveyed to me by Vettor Fausto, professor of Greek in Venice and illustrious mathematician, will remain secret."<sup>517</sup> Zulle proudly recalled the work of Fausto in the Arsenal, his study of the Greek and Latin writers, and how his theoretical knowledge, combined with practical skills acquired in the shipyard over the years, gave him an advantage over the purely empirical shipbuilding practice employed by the *proti*.

At the end of the inquiry, the main question regarding the mechanical problems of the rowing system of the galleass was not resolved. Several issues needed assessing: first, the length of the oars, which were pulled by five men on the same bench; and second, the distance between the tholes, and third the length and angle of each bench.

---

<sup>516</sup> Sanuto, XLII, col. 765.

<sup>517</sup> Musler 1538, fol. 33b: *Victoris Fausti illius Graecae linguae Venetiis publici per lectoris, insignis mathematici, qua in vai, eius arte consiliisque extruenda communicavit appèta manebunt consilia.*

The urgency of building more efficient and maneuverable galleys was dictated by the fact that the Venetians – and all of Christendom – realized that the threat of the Ottoman Empire had not been eliminated in the waters of Lepanto, but, in spite of the Christian victory, to the contrary, the Ottomans were in the process of building a much stronger and larger fleet to replace their losses at Lepanto.<sup>518</sup>

Thus, in 1593, during the inquiry at the Arsenal, the maritime Republic of Venice turned to the most famous professor of mathematics then available, Galileo Galilei. Giacomo Contarini (1536-1595), one of the Proveditors of the Arsenal, wrote to Galilei asking for technical advice on the configuration of the oars and how to enhance their power. Contarini's interest in shipbuilding is shown by the presence in his personal archive (now in the State Archive of Venice) of various manuscripts on Venetian naval architecture. One of the most applicable to his research is *Arte de far vasselli* ("The Art

---

<sup>518</sup> In 1573, two years after the battle of Lepanto, the *bailo* Marcantonio Barbaro reported to the *Serenissima* that "the Grand Turk has in his Arsenal (*i.e.*, in Galata) 300 rowed ships, among which are 14 *maone* (*i.e.* merchant vessels that took their name from the Medieval trade joint-stock company called *maona*). He can easily build many ships of any type, due to the abundance of wood that is imported from the Great Sea (*i.e.*, the Black Sea). We have seen that, after the defeat (at Lepanto), in six months the Ottomans were able to rebuild 120 galleys, plus those that have already built, which [...] was almost impossible to believe, especially because they have already armed and outfitted those new galleys." In Alberi 1840, III, 2: 306. With regard to Ottoman polyremes, the Sea Captain *Uluzzali* (Uluch Ali), on 23 March 1573, launched a galley he had had built with 30 benches and seven rowers per bench. The *bailo* Marcantonio Barbaro reported that the galley, however, was "very slow, even though the rowers were strong" (ASVe, Senato, Dispacci, Costantinopoli, string 6, folios not numbered, dispatch dated to 23 March 1573). From the report sent by the *bailo* Giovanni Correr, dated to 4 April 1576, it seems that the Ottomans experimented with new rowing systems in this period. The Bassà (Pasha, the Admiral of the Ottoman Navy) consulted "a shipwright from Curzola (Dubrovnik), who offered to show a secret, that is how to build a galley capable of being rowed either with two rowers per bench, or with four." The Ottomans, however, never built such ship, for "the Bassà did not believe him, since – if it were true – the Christians would have already built such a galley" (ASVe, Senato, Dispacci, Costantinopoli, string 9, folios not numbered, dispatch dated to 4 April 1576).

of Building Ships”), which recorded the shipbuilding instructions for building a quadrireme – another galley type invented by Fausto.<sup>519</sup>

Thus, Galilei studied, as had done Fausto some years earlier, the rowing arrangement of galleys from classical periods.<sup>520</sup> Toward the end of 1638, Galilei published his most authoritative scientific work focused on mechanics, entitled “Discourses and Mathematical Demonstrations on Two New Sciences Concerning Mechanics and Local Motions.” It is by coincidence that Galilei opens his work with a praise of the Arsenal, which can be regarded probably as the highest recognition and tribute to Vettor Fausto:

A large field for philosophical investigation is open to inquisitive minds by frequenting your famous Arsenal, Venetian gentlemen, and particularly in that branch that is called mechanics, since every sort of instrument and machine is continually put into operation there by a great number of artisans. Among them there must be some who, through observations handed down by their predecessors, as well as through those which they attentively and continually make on their own, are highly expert and capable of the most subtle reasoning.<sup>521</sup>

---

<sup>519</sup> The manuscript *Arte de far vasselli* is in ASVe, Archivio Proprio Contarini, env. 19. It is dated to ca. 1570. Since the focus of this thesis is on the quinquereme, *Arte de far vasselli* is not discussed. Nevertheless, it is of interest to note that, on 21 September 1551, four quadriremes sailed in the Venetian fleet. By 1563 in the Arsenal there were five quadriremes that were yet to be completed, and six more that had served for a short period; see ASVe, Senato mar, reg. 35 fol. 42r and 43r-v (the latter dated to 1 June 1563). The quadriremes serving in the Venetian fleet were the Admiral ships, such as that belonging to Antonio da Canal, who in 1566 attacked some Ottoman galliots in the waters off Corfu (ASVe, Senato mar, reg. 36, fol. 102r). That the Ottoman fleet also had a quadrireme is reported by the *bailo* Gerolamo Ferro (ASVe, Senato, Dispacci, Costantinopoli, string 2-B, folios not numbered, dispatch dated to 4 October 1560).

<sup>520</sup> Renn and Valleriani 2001, 19.

<sup>521</sup> Galilei 1638, 1.1: *Largo campo di filosofare à gl'intelletti specolativi parmi che porga la frequente pratica del famoso Arsenale di Voi Sig. Veneziani, et in particolare in quella parte che mechanica si domanda, atteso che quivi ogni sorte di strumento e di machine vien continuamente posta in opera da numero grande d'artefici, tra i quail, e per osservazioni fatte da i loro antecessori, e per quelle che di propria avvertenza vanno continuamente per se stessi facendo, è forza che ve ne siano dei peritissimi e di finissimo discorso.* The treatise is a dialogue involving three characters: Salviati, Sagredo, and Simplicio, and takes place on four different days. The citation is from the dialogue between Salviati and Sagredo that takes place on the first day.

After the praise for the Arsenal, Galilei mentioned “the great galleass” that was built based on Fausto’s ship design.<sup>522</sup> Thus, the scientific revolution had begun and Vettor Fausto’s important contributions helped pave the way.

---

<sup>522</sup> Galilei 1638, 1.2. Galilei, however, claimed that *la gran galeazza* (“the great galleass”) was “...very heavy due to its huge size, which made it inconvenient (*oppressa dal gravissimo peso della sua vasta mole, inconveniente*).

## CHAPTER VI

### SUMMARY AND CONCLUSIONS

Vettor Fausto was well ahead of his time; he was able to combine his humanistic theoretical knowledge with shipbuilding practical skills. No one after Fausto was able to build a galley according to ancient Greek and Roman proportions: his ability as a *marina architectura* (naval architecture) lived and died with him. Although Fausto represented an isolated figure and an exception among the shipbuilders in the Venetian Arsenal who relied on empirical shipbuilding practices, he nevertheless profoundly influenced the history of naval architecture.

In the first decade of the 16<sup>th</sup> century, Fausto began his studies at the prestigious School of Saint Mark in Venice. In 1509, however, the War of the League of Cambrai drastically changed the situation in the Republic of Venice, and the School temporarily closed its doors during the war. Fausto then undertook a six-year-long journey that brought him to other Italian maritime cities, Spain, and France. Upon his return to Venice he wished to place his newly gained knowledge at the service of the *Serenissima*, the Most Serene Republic of Venice. In 1518, Fausto was appointed professor of Greek at the School of Saint Mark, which had opened its doors after the termination of the war in 1511. In 1526, Fausto proposed to the Venetian Senate the construction of a new, superior type of galley he called the quinquereme, the proportions of which he based on his knowledge of ancient Greek and Roman ships. With some skepticism, the Senators

approved the proposal, and in 1529, Fausto launched his quinquereme in the Grand Canal, where the ship won a race against a light galley.

In the 14<sup>th</sup> century, Italian humanists recovered the foundations of ancient learning through the rediscovery of Classical Greek and Latin works which had fallen into obscurity and lay buried in many European libraries and monasteries. The rebirth (*rinascimento*) of the Classical tradition and the spread of classically-inspired values resulted in significant cultural changes and achievements in many fields: from art and literature to philosophy and architecture. Vettor Fausto purported to introduce in naval architecture a shipbuilding principle that he applied in the design of his quinquereme. According to Fausto the naval architecture (*marina architettura*) had to be based on the knowledge that derived from the study of ancient Greek mathematicians, and not only on experience and practical skills.

The Renaissance idea of beauty, which derived from the harmony of proportions, led to major changes in the rules and application of shipbuilding practices. The art of shipbuilding, as with all crafts based on oral knowledge, retained its conservative character throughout the centuries. New techniques and designs have always had difficulty penetrating the minds of shipwrights, who primarily relied on practical expertise and repetitive gestures for building ships. Thanks to the past works of eminent scholars of naval architecture manuscripts, our knowledge and understanding of shipbuilding practices has increased significantly. We now know that starting at least from the second half of the 14<sup>th</sup> century, shipwrights designed ships by means of molds (*sesti*) and gauges (*morelli*) that were calibrated with progressive markings. The



calibrations on these tools were generated by simple geometrical methods, which were often graphically represented in shipbuilding manuscripts, such as the *Libro di Zorzi Trombetta da Modon* (“The Notebook of Zorzi Trombetta from Modon”), dated to 1444-1449. In designing ships, the shipwrights manipulated the molds and gauges along each station, or frame location, thus obtaining the narrowing and the rising of each frame.

These new shipbuilding methods were based on rules of geometry, such as proportions, and are referred to in Venetian manuscripts as *ragioni fabbricatorie*, or building methods. The establishment of the *navium ratio* (shipbuilding principle) based on mathematical calculations, led, through the centuries, to the birth of modern naval architecture. In the present study, it has been suggested that Fausto based his shipbuilding principle on the works of Greek mathematicians and philosophers, such as Aristotle, Apollonius of Perga, and Euclid.

The 16<sup>th</sup> century was a period of many technical innovations in naval architecture. Fausto purported to introduce in naval architecture a shipbuilding principle that he applied in the design of his quinquereme. In this, Fausto basically codified the empirical shipbuilding methods of the Venetian shipwrights into a mathematical formula, which is known to later mathematicians as the Gaussian formula.

Renaissance documents and naval treatises provide descriptions of Fausto’s quinquereme and illuminate, to some extent, its technical features, such as the number of benches, the rowing system, and the steering mechanism he used. Fausto claimed that he recreated the ancient quinquereme used by the Romans in their wars and, in doing so, he relied on ancient Greek texts for generating the proportions for his quinquereme.

The most revealing document on this matter is the manuscript titled *Misure di vascelli etc. di...proto dell'Arsenale di Venetia* (“Measurements of vessels etcetera by...a master shipbuilder of the Arsenal of Venice”), which contains shipbuilding instructions for several types of ships. Originally belonging to the private collection of the erudite Giovan Vincenzo Pinelli (1535-1601), this manuscript has never been fully studied, and its authorship has as yet to be established. Perhaps, due in part to the lack of sufficient technical shipbuilding knowledge, modern scholars have failed to note the relationship between Fausto’s work at the Arsenal and this manuscript, a source well known since the 19<sup>th</sup> century, but still regrettably misinterpreted.

The series of calculations in this manuscript are based on ancient and modern mathematics, requiring an extensive knowledge of both mathematics that only Fausto could have possessed. The hypothesis advanced in this thesis is that the manuscript is the work of Fausto’s apprentice, Giovanni di Maria di Zanetto, nicknamed Zulle, who became *proto* (master shipbuilder) of the Arsenal in 1570. Zulle, at the eve of the Battle of Lepanto, was requested by the Venetian Senate to build the last galleon *alla Faustina* (in the Fausto way), which was to become the flagship of the Papal contingent, led by Marcantonio Colonna, of the great Christian fleet against the Turks. The “Greek dream” of Fausto and his *marina architectura*, however, met their demise off the coast of Ragusa, never to be reborn, when the galleon was struck by lightning and completely destroyed.

Nevertheless, Vettor Fausto, although an outsider to the fiercely guarded world of shipbuilding, paved the way for the foundations of a scientific revolution in the conservative realm of the Venetian Arsenal.

## WORKS CITED

- Ackerman, J. 1949. “*Ars sine scientia nihil est*. Gothic Theory of Architecture at the Cathedral of Milan.” *Art Bulletin* 31: 84-111.
- Agnoletti, M. 2007. “Gestione del bosco e costruzioni navali all’epoca d’oro (secoli XVI-XVII).” In *L’arte dei remèri. I 700 anni dello statuto dei costruttori di remi*, edited by G. Caniato, 111-25. Verona, Italy: Cierre Edizioni.
- Alberi, E.. ed. 1840. *Relazioni degli ambasciatori veneti al Senato. Relazioni degli stati ottomani*. 3 vols. Firenze, Italy: All’Insegna di Clío.
- Alertz, U. 2003. “The Venetian Merchant Galley and the System of *Partisoni* – Initial Steps towards Modern Ship Design.” In *Boats, Ships and Shipyards. Proceedings of the IX International Symposium on Boat and Ship Archaeology, Venezia 2000*, edited by C. Beltrame, 212-221. Oxford, UK: Oxbow.
- Altieri Biagi, M.L. 1965. “Vile meccanico.” *Lingua Nostra* 26: 1-12.
- Anderson, R. C. 1925. “Italian Naval Architecture about 1445.” *The Mariner’s Mirror* 11(2): 135-63.
- \_\_\_\_\_. 1945. “Jal’s ‘Memoire No. 5’ and the Manuscript ‘Fabrica di galere’.” *The Mariner’s Mirror* 31(3): 160-7.
- \_\_\_\_\_. 1962. *Oared Fighting Ships*. London: Percival Marshall.
- Archibald, R.C. 1916. “Historical Note on Centers of Similitude of Circles.” *The American Mathematical Monthly* 23: 159-61.

- Aymard, M. 1980. "L'Arsenale e le conoscenze tecnico-marinaresche. Le arti." In *Storia della cultura veneta. Dal primo Quattrocento al concilio di Trento*. 3 vols. Edited by G. Arnaldi and M. Pastore Stocchi, 3: 289-315. Vicenza, Italy: Neri Pozza.
- \_\_\_\_\_. 1987. "L'arsenal de Venise: science, expérience et technique dans la construction navale au XVI<sup>e</sup> siècle." In *Cultura, scienze e tecniche nella Venezia del Cinquecento: atti del convegno internazionale di studio Giovan Battista Benedetti e il suo tempo*, edited by A. Manno, 407-18. Venezia, Italy: Istituto Veneto di Scienze, Lettere ed Arti.
- \_\_\_\_\_. 1991. "Strategie di cantiere." In *Storia di Venezia dalle origini alla caduta della Serenissima. Temi: il mare*, edited by A. Tenenti and U. Tucci, 259-83. Roma, Italy: Istituto della Enciclopedia Italiana.
- Baïf (de), L. 1537. *De re navali libellus, in adoluscentorum bonarum literarum studiosurum favorem Lugduni* (Lyon, France): Apud Haeredes Simonis Vincentii.
- Baldassarri, S. U., ed. 1994. *Dialogi ad Petrum Paulum Histrum*. Firenze, Italy: Leo S. Olschki.
- Balsamo. 2002. "Aldo Manuzio e la diffusione dei classici greci." In *L'eredità greca e l'ellenismo veneziano*, edited by G. Benzoni, 171-88. Venezia, Italy: Leo S. Olschki.
- Barker, R. 1986. "Fragments from the Pepysian Library." *Revista da Universidade de Coimbra* 32: 161-78.

- \_\_\_\_\_. 1988. "Many May Peruse Us: Ribbands, Molds and Models in the Dockyards." *Revista da Universidade de Coimbra* 34: 539-59.
- \_\_\_\_\_. 2007. "Two Architectures – A View of Sources and Issues." In *Creating Shapes in Civil and Naval Architecture. A Cross-disciplinary Comparison*, edited by H. Nowacki and W. Lefèvre, 41-133 (workshop report, preprint 338). Berlin: Max Plank Institute.
- Barozzi, N., and G. Berchet, eds. 1863. *Le relazioni degli stati Europei lette al Senato dagli ambasciatori veneti nel secolo decimosettimo*. 10 vols. Venezia: Pietro Naratovich.
- Barsanti, P. 1905. *Il pubblico insegnamento in Lucca nel secolo XIV alla fine del secolo XVIII. Contributo alla storia della cultura nazionale*. Lucca, Italy: A. Marchi.
- Basch, L. 1998. "Construction privée et construction d'Etat dans l'Antiquité." In *Concevoir et construire les navires de la trière au picoteaux*, edited by E. Rieth, 21-48. Ramonville Saint-Agne, France: Editions Erès.
- Bataillon, M. 1937. *Erasmus y España. Estudios sobre la historia spiritual del siglo XVI*. 2 vols. Buenos Aires: Fondo de Cultura Económica.
- Bellarbarba, S. 1993. "The Ancient Methods of Designing Hulls." *The Mariner's Mirror* 79(3): 274-92.
- Bembo, P. 1538. *Epistolarum Leonis decimi Pontificis Max. nomine scriptarum libri XVI*. Lugduni (Lyon, France): Apud heredes Simoniis Vincentii.
- Bernardo, A., ed. 1982. *Francesco Petrarca. Letters on Familiar Matters. Rerum familiarium libri*. 3 vols. Baltimore: Johns Hopkins University Press.

Bertoloni Meli, D. 1992. "Guidobaldo dal Monte and the Archimedean Revival."

*Nuncius* 7: 3-34.

Bigliuzzi, L. 1994. *Aldo Manuzio tipografo, 1495-1515*. Firenze: Octavo.

Bondioli, M. 1995. "Oar Mechanics and Oar Power in Medieval and Later Galleys." In

*The Conway's History of Ship. The Age of the Galley. Mediterranean Oared*

*Vessels since Pre-classical Times*, edited by R. Gardiner, 173-205. London:

Conway Maritime Press.

\_\_\_\_\_. 1996. "Arte della costruzione navale veneziana tra il XV e il XVI secolo:

riflessioni e nuovi documenti." In *Navalia. Archeologia e Storia*, edited by F.

Ciciliot, 139-55. Savona, Italy: The International Propeller Club.

\_\_\_\_\_. 2003. "The Art of Designing and Building Venetian Galleys from the 15<sup>th</sup> to the

16<sup>th</sup> Centuries." In *Boats, Ships and Shipyards. Proceedings of the IX*

*International Symposium on Boat and Ship Archaeology, Venezia 2000*, edited

by C. Beltrame, 222-7. Oxford: Oxbow.

\_\_\_\_\_. 2009. "Early Shipbuilding Records and the Book of Michael of Rhodes." In *The*

*Book of Michael of Rhodes: A Fifteenth-century Maritime Manuscript*. 3 vols.

*Volume 3: Studies*, edited by P. O. Long, D. McGee, A. M. Stahl, 243-80.

Cambridge, MA: Massachusetts Institute of Technology.

Bondioli, M., and G. Penzo. 1999. "*Teodoro Baxon e Nicola Palopano protti delle galee*

*sottili. L'influsso greco nelle costruzioni navali veneziane della prima metà del*

*XV secolo.*" *Archeologia delle Acque* 2: 67-80.

- Bonelli, R., and P. Portoghesi, eds. 1966. *Leon Battista Alberti. L'Architettura (De re aedificatoria)*. 2 vols. Milano: Edizioni il Polifilo.
- Boyancé, P. 1970. *Études sur l'humanisme cicéronien*. Bruxelles: Latomus.
- Branca, V. 1980. "L'Umanesimo veneziano alla fine del Quattrocento. Ermolao Barbaro e il suo circolo." In *Storia della cultura veneta. Dal primo Quattrocento al concilio di Trento*. 3 vols, edited by G. Arnaldi and M. Pastore Stocchi, 1: 123-75. Vicenza: Neri Pozzi Editore.
- \_\_\_\_\_. 1983. *Umanesimo e Rinascimento a Firenze e Venezia*. 2 vols. Firenze: L. S. Olschki.
- Braudel, F. 1976. *Civiltà e imperi del Mediterraneo nell'età di Filippo II*. 2 vols. Torino: Einaudi.
- Brentjes, S. 2008. "Euclid's Elements, Courtly Patronage and Princely Education." *Iranian Studies* 41(4): 441-63.
- Bruschi, A., C. Maltese, M. Tafuri, and R. Bonelli. 1978. *Scritti rinascimentali di architettura*. Milano: Edizioni Il Polifilo.
- Burckhardt, J. 1904. *The Civilization of the Renaissance in Italy*. London: S. Sonnenschein.
- Butterfield, H. 1962. *The Origin of Modern Science*. New York: Collier Books.
- Calabi, D., and P. Morachiello. 1987. *Rialto, le fabbriche e il ponte (1514-1591)*. Torino, Italy: Giulio Einaudi Editore.



- Carugo, A. 1984. "L'insegnamento della matematica all'università di Padova prima e dopo Galileo." In *Storia della cultura veneta. Il Seicento*. 4 vols, edited by G. Arnaldi and M. Pastore Stocchi, 2: 151-99. Vicenza: Neri Pozza.
- Casoni, G. 1838. "Dei navigli poliremi usati nella marina degli antichi veneziani." *Esercitazioni scientifiche e letterarie dell'Ateneo di Venezia*, 2: 307-55.
- Casson, L. 1971. *Ships and Seamanship in the Ancient World*. Princeton, NJ: Princeton University Press.
- \_\_\_\_\_. 1994. *Ships and Seafaring in the Ancient Times*. Austin: University of Texas Press.
- Castellani, C., ed. 1895. *Catalogus codicum graecorum qui in bibliothecam D. Marci Venetiarum inde ab anno MDCCXL ad haec usque tempora inlati sunt*. Venetiis: Ongania et Visentini.
- Castro, F. 2005. *The Pepper Wreck: A Portuguese Indiaman at the Mouth of the Tagus River*. College Station: Texas A&M University.
- \_\_\_\_\_. 2007. "Rising and Narrowing: Sixteenth-century Geometric Algorithms used to Design the Bottom of Ships in Portugal." *IJNA* 36(1): 148-54.
- Cecchetti, B. 1886. "Libri, scuole, maestri, sussidii allo studio in Venezia nei secoli XIV e XV." *Archivio Veneto* 32(2): 329-63.
- Celenza, C. 2009. "Hellenism in the Renaissance." In *The Oxford Handbook of Hellenic Studies*, edited by G. Bouys-Stones, B. Graziosi, and P. Vasunia, 150-65. New York: Oxford University Press.
- Cessi, R. 1988. *Storia della Repubblica di Venezia*. 2 vols. Firenze: Sansoni Editore.

- Chiggiato, A., ed. 1987. *Ragioni antique spettanti all'arte del mare et fabbriche de vasselli: manoscritto nautico del sec. XV*. Venezia, Italy: Il Comitato Editore.
- Cian, V. 1885. *Un decennio della vita di M. Pietro Bembo (1521-1531). Appunti biografici e saggio di studi sul Bembo*. Torino, Italy: Loescher.
- Ciccolella, F. 2008. *Donati Graeci. Learning Greek in the Renaissance*. Leiden, Netherlands: Brill.
- Cicogna, E. A. 1824-1853. *Delle iscrizioni veneziane*. 6 vols. Venezia, Italy: Giuseppe Piccotti.
- Clagett, M. 1955. *Greek Science in Antiquity*. New York, Abelard-Schuman
- \_\_\_\_\_. 1964. "A Medieval Latin Translation of a Short Arabic Tract on the Hyperbola." *Osiris* 11: 359-85.
- Clarke, M.L. 1963. "The Architects of Greece and Rome." *Architectural History* 6: 9-22.
- Coates, J. 1995. "The Naval Architecture and Oar System of Ancient Galleys." In *Conway's History of Ship. The Age of the Galley. Mediterranean Oared Vessels since Pre-classical Times*, edited by R. Gardiner, 127-41. London: Conway Maritime Press.
- Colish, M. 1978. "Cicero's De Officiis and Machiavelli's Prince." *The Sixteenth Century Journal* 9(4): 91-93.
- Concina, E. 1984. *L'Arsenale della repubblica di Venezia*. Milano, Italy: Electa.
- \_\_\_\_\_. 1987a. "La fascination de l'antique en fait d'architecture navale. Une lettre de Vettor Fausto." In *Amphion. Études d'histoire de techniques*, edited by G. Jacques, 23-28. Paris: Picard.

- \_\_\_\_\_. 1987b. “Marina architectura” e “fabrilis peritia”: l’iconografia reinterpretata di un disegno mantegnesco e gli atteggiamenti culturali del primo ‘500 Veneto.” In *Cultura, scienze e tecniche nella Venezia del cinquecento*, edited by A. Manno, 387-405. Venezia, Italy: Istituto Veneto di Scienze, Lettere ed Arti.
- \_\_\_\_\_. 1988a. *Pietre, parole, storia: glossario della costruzione nelle fonti veneziane (secoli XV-XVIII)*. Venezia, Italy: Marsilio.
- \_\_\_\_\_. 1988b. “Humanism on the Sea.” *Mediterranean Historical Review* 3(1): 159-65.
- \_\_\_\_\_. 1989. *Venezia nell’età moderna. Struttura e funzioni*. Venezia, Italy: Marsilio.
- \_\_\_\_\_. 1990. *Navis. L’umanesimo sul mare (1470-1740)*. Torino, Italy: Giulio Einaudi Editore.
- \_\_\_\_\_. 1991a. “La casa dell’Arsenale.” In *Storia di Venezia dalle origini alla caduta della Serenissima. Temi: il mare*, edited by A. Tenenti and U. Tucci, 147-210. Roma: Istituto della Enciclopedia Italiana.
- \_\_\_\_\_. 1991b. “La costruzione navale.” In *Storia di Venezia dalle origini alla caduta della Serenissima. Temi: il mare*, edited by A. Tenenti and U. Tucci, 211-58. Roma: Istituto della Enciclopedia Italiana.
- \_\_\_\_\_. 2006. *Venezia e Istanbul: incontri, confronti, e scambi*. Udine: Forum.
- Concina, E., and E. Molteni. 2001. *‘La fabbrica della fortezza:’ l’architettura militare a Venezia*. Modena, Italy: Poligrafico Artioli.
- Cosenza, M. E. 1962. *Biographical and Bibliographical Dictionary of the Italian Humanists and of the World Classical Scholarship in Italy, 1300-1800*. 6 vols. Boston: G.K. Hall & Co.

Crescenzo, B. 1601. *Nautica mediterranea*. Roma: Appresso Bartolomeo Bonfandino.

Crombie, A.C., 1959. *Medieval and Early Modern Science*. 2 vols. New York:

Doubleday.

D'Agostino, M., S. Medas, and J. McManamon. 2003. "Excavation and Recording of the

Medieval Hulls at San Marco in Boccalama (Venice)." *INA Quarterly* 30(1): 22-

8.

Dalle Fosse, U. B. 1512. *Urbani Bolzani Grammaticae institutiones iterum perquam*

*diligenter elaboratae. Impressum Venetiis: sumptu miraue diligentia Ioanis de*

*Tridino alias Tacuino, 1512 die XX. Augusti* [Venice: Tridino de Tacuino].

Da Mosto, A. 1937. *L'archivio di Stato di Venezia. Indice generale, storico, descrittivo*

*ed analitico*. Roma: Biblioteca d'Arte Editrice.

Degli Agostini, G. 1752-1754. *Notizie istorico-critiche intorno alla vita, e le opere degli*

*scrittori viniziani*. 2 vols. Venezia, Italy: Occhi.

De Vivo, F. 2007. *Information and Communication in Venice: Rethinking Early Modern*

*Politics*. Oxford, UK: Oxford University Press.

Di Pasquale, S. 1996. *L'Arte del costruire tra conoscenza e scienza*. Venezia, Italy:

Marsilio.

Douglas, R. M. 1959. *Jacopo Sodoletto (1477-1547): Humanist and Reformer*.

Cambridge, MA: Harvard University Press.

Drachmann, A. G. 1963. *The Mechanical Technology of Greek and Roman Antiquity: A*

*Study of the Literary Sources*. Madison: University of Wisconsin Press.

- Drake, S., N. Swerdlow, and T. H. Levere. 1999. *Essays on Galileo and the History and Philosophy of Science*. 3 vols. Toronto: Toronto University Press.
- Duggan, M. K. 1992. *Italian Music Incunabula: Printers and Type*. Berkeley: University of California Press.
- Dupré, S. 2002. *Galileo, the Telescope, and the Science of Optics in the Sixteenth Century: A Case Study of Instrumental Practice in Art and Science*. Ghent, Belgium: Universiteit Gent.
- \_\_\_\_\_. 2003. *Renaissance Optics: Instruments, Practical Knowledge and the Appropriation of Theory*. Berlin: Max Planck Institute.
- Dupuy, C., and A.M. Raugé. 2001. *Une correspondance entre deux humanistes*. Firenze, Italy: Leo S. Olschki.
- Eco, U. 2004. *History of Beauty*. New York: Rizzoli.
- Egnazio (Cipelli), G. 1554. *De exemplis virorum Venetae civitatis atque aliarum gentium*. Venetiis (Venice, Italy): Apud Nicolaum Tridentinum.
- Ergang, R. R. 1967. *The Renaissance*. Princeton, NJ: Van Nostrand.
- Fasoli, G. 1958. "Nascita di un mito. Il mito di Venezia nella storiografia." In *Studi storici in onore di Gioacchino Volpe per il suo ottantesimo compleanno*. 2 vols. Firenze, Italy: Biblioteca Storica Sansoni.
- Fausto, V. 1511. *Hoc pugillari Terentius numeris concinatus, et L. Victoris Fausti de comoedia libello nova recognitione, litterisque novis continetur. Hasce Terentii fabulas censura cujusdam sane eruditi viri, sumptibusque assiduis imprimendas Lazarus Soardus curavit*. Venetiis (Venice): Apud Lazarum Soardiis.

- \_\_\_\_\_. 1511. *M. T. Ciceronis tres de officiis libri, et aureum illud de amicitia senectuteque volumen una cum paradoxis hoc habentur pugillari*. Venetiis (Venice): Lazarus Soardus.
- \_\_\_\_\_. 1517. *Aristotelis Mechanica Victoris Fausti industria in pristinum habitum restituta ac latinitate donate*. Ludguni (Lyon, France): In aedibus Iodoci Badii.
- \_\_\_\_\_. 1551. *Victoris Fausti veneti orationes quinque eius amicorum cura quam fieri potuit diligenter impressae*. Venetiis (Venice): Apud Aldi Filios.
- Ferreiro, L. 2009. *The Aristotelian Heritage in Early Naval Architecture, from the Venetian Arsenal to the French Navy, 1500-1700*. Berlin: Max Planck Institute.
- Fincati, L. 1881. *Le triremi*. Roma: Tipografia Barbera.
- Finley, R. 1999. "The Myth of Venice in Guicciardini's 'History of Italy': Senate Orations on Princes and the Republic." In *Medieval and Renaissance Venice*, edited by E. E. Kittell and T. F. Madden, 294-328. Urbana: University of Illinois Press.
- Foffano, F. 1892. "Marco Musuro, professore di greco a Padova ed a Venezia." *Nuovo Archivio Veneto* 3: 453-73.
- Folkerts, M. 2003. *Essays on Early Medieval Mathematics: The Latin Tradition*. Aldershot, UK: Ashgate.
- \_\_\_\_\_. 2006. *The Development of Mathematics in Medieval Europe: The Arabs, Euclid, Regiomontanus*. Aldershot: Ashgate.
- Forcellini, E. 1833. *Totius latinitatis lexicon*. 4 vols. Schneebergae (Schneeberg, Auatria): C. Schumanni.

- Foucault, M. 2000. *The Essential Works of Michael Foucault, 1954-1984*. 2 vols. London: Penguin.
- Fozzati, L., ed. 2002. *La galea ritrovata. Origine delle cose di Venezia*. Venezia: Marsilio Edizioni.
- Frommel, C. 1994. *The Architectural Drawings of Antonio da Sangallo the Younger and His Circle*. Cambridge, MA: The MIT Press.
- Gaeta, F. 1961. "Alcune considerazioni sul mito di Venezia." *Bibliothèque d'Humanisme et Renaissance. Travaux et documents* 23: 58-75.
- Galilei, G. 1638. *Discorsi e dimonstrazioni matematiche intorno a due scienze attenenti alla meccanica et i movimenti locali del Signor Galileo Galilei Linceo, filosofo e matematico primario del Serenissimo Grand Duca di Toscana. Con un'appendice del centro di gravità d'alcuni solidi*. Leida (Leiden, Netherlands): Appresso gli Elsevirii
- Gamba, E., and V. Montebelli. 1987. "La matematica abbachistica tra ricupero della tradizione e rinnovamento scientifico." In *Cultura, scienze e tecniche nella Venezia del cinquecento*, edited by A. Manno, 169-202. Venezia, Italy: Istituto Veneto di Scienze, Lettere ed Arti.
- Geanakoplos, D. J. 1962. *Byzantium and the Renaissance: Greek Scholars in Venice. Studies in the Dissemination of Greek Learning from Byzantium to Western Europe*. Cambridge, MA: Harvard University Press.
- Garin, E. 1965. *Italian Humanism. Philosophy and Civic Life in the Renaissance*. New York: Harper & Row.

- Gentile, G. 1931. *La filosofia dell'arte*. Milano, Italy: Treves.
- \_\_\_\_\_. 1968. *Il pensiero italiano nel Rinascimento*. Firenze, Italy: Sansoni.
- Gerson, L. 1994. *Plotinus*. London: Routledge.
- Gibbs Smith, C.H. 1978. *Les inventions de Léonard de Vinci*. Oxford, UK: Oxford University Press.
- Giraldi, L. G. 1540. *Lilii Gregorii Gyraldi ferrariensis, de re nautica libellus, admiranda quadam et recondita eruditione refertus, nunc primum et natus et aeditus*. Basiliae (Basilea, Swiss): Apud Michaellem Isingrinium.
- Giustiniani, V. 1961. "Sulle traduzioni latine delle 'Vite' di Plutarco nel Quattrocento." *Rinascimento* 12: 1-59.
- \_\_\_\_\_. 1979. "Plutarch und die humanistische Ethik." *Beitrage zur Humanismusforschung* 5: 45-62.
- \_\_\_\_\_. 1985. "Homo, Humanus, and the Meaning of Humanism." *Journal of the History of Ideas* 46(2): 167-95.
- Gleditsch, J. F. 1741. *Nova acta eruditorum*. Lipsiae (Leipzig, Germany) : Apud B. Lanckisii haeredes.
- Godwin, J. 1999. *Francesco Colonna. Hypnerotomachia Poliphili. The Strife of Love in a Dream*. New York: Thames and Hudson.
- Gomez de Castro, Alvaro. 1569. *De rebus gestis a Francisco Ximeno, Cisnerio, archiepiscopo Toletano, libri octo*. Compluti (Alcalá de Henares, Spain): Apud Andream de Angulo.



- Gozzi, Gaetano. 1849. *Scritti, con giunta d'inediti e rari, scelti e ordinate da Niccolò Tommaseo, con note e proemio*, 3 vols. Firenze: Le Monnier. Grant, John N.
1988. "Pietro Bembo and Vat. Lat. 3226." *Humanistica Lovaniensia* 37: 211-43.
- Granger, F. 1925. "Vitruvius' s Definition on Architecture." *The Classical Review* 39: 67-9.
- Grendler, M. 1980. "A Greek Collection in Padua: The Library of Gian Vincenzo Pinelli (1535-1601)." *Renaissance Quarterly* 33(3): 386-416.
- \_\_\_\_\_. 1981. "Book-collecting in Counter-Reformation Italy: The library of Gian Vincenzo Pinelli, 1535-1601." *Journal of Library History*, 16: 143-51.
- Grendler, Paul. 1985. "The Organization of Primary and Secondary Education in the Italian Renaissance." *Catholic Historical Review* 71: 185-205.
- \_\_\_\_\_. 1989. *Schooling in Renaissance Italy. Literacy and Learning, 1300-1600*. Baltimore: The Johns Hopkins University Press.
- \_\_\_\_\_. 1990. "Schooling in Western Europe." *Renaissance Quarterly* 43: 775-88.
- \_\_\_\_\_. 1999. *Encyclopedia of the Renaissance*. New York: Scribner's.
- \_\_\_\_\_. 2002. *The Universities of the Italian Renaissance*. Baltimore: The Johns Hopkins University Press.
- Grubb, James. 1986. "When Myths Lose Power: Four Decades of Venetian Historiography." *Journal of Modern History* 58: 43-94.
- Gualdo, P. 1607. *Vita Ioannis Vincentii Pinelli, patrici genuensis in qua studiosi bonarum artium, proponitur typus viri probi et eruditi*. Augusta Vincelicorum (Augsburg, Germany): Christophorus Mangus.

- Gualdo Rosa, L. 2005. "Un decennio avventuroso nella biografia del Parrasio (1509-1519): Alcune precisazioni e qualche interrogativo." *AIΩN (AIŌN)* 27: 25-36.
- Guglielmotti, A. 1862. *Marcantonio Colonna alla battaglia di Lepanto*. Firenze, Italy: Le Monnier.
- Gummerre, R. 1920. *Seneca. Ad Lucilium Epistulae Morales*. London: W. Heinemann.
- Hale, J. R. 1980. "Industria del libro e cultura militare a Venezia nel Rinascimento." In *Storia della cultura veneta. Dal primo Quattrocento al concilio di Trento*. 3 vols, edited by G. Arnaldi and M. Pastore Stocchi, 2: 245-82. Vicenza, Italy: Neri Pozzi Editore.
- Hankins, J. 1990. *Plato in the Italian Renaissance*. 2 vols. New York: Brill.
- Hankins, J., and A. Palmer. 2008. *The Recovery of Ancient Philosophy in the Renaissance: A Brief Guide*. Firenze, Italy: Leo S. Olschki Editore.
- Harris, N. 1995. *The Art of Renaissance*. Bristol, UK: Paragon Book.
- Heath, T.L. 1896. *Apollonius of Perga. Treatise on Conic Sections*. Cambridge, MA: Cambridge University Press.
- Henninger-Voss, M. 2000. "Working Machines and Nobles Mechanics: Guidobaldo del Monte and the Translation of the Knowledge." *Isis* 91(2): 233-59.
- Hett, W. S. 1936. *Aristotle. Minor Works*. Cambridge, MA: Harvard University Press.
- Hocker, F. M., and Dokkedal, L. 2001. "News from the Kolding Cog." *Maritime Archaeology Newsletter from Roskilde, Denmark* 16: 16-7.

- Hocker, F.M., and J.M. McManamon. 2006. "Medieval Shipbuilding in the Mediterranean and Written Culture at Venice." *Mediterranean Historical Review* 21: 1-37.
- Hocquet, J.-C. 1991a. "L'armamento privato." In *Storia di Venezia dalle origini alla caduta della Serenissima. Temi: il mare*, edited by A. Tenenti and U. Tucci, 397-433. Roma: Istituto della Enciclopedia Italiana.
- \_\_\_\_\_. 1991b. "Squeri e unità mercantili." In *Storia di Venezia dalle origini alla caduta della Serenissima. Temi: il mare*, edited by A. Tenenti and U. Tucci, 313-54. Roma: Istituto della Enciclopedia Italiana.
- Hodius, H. and S. Jebb. 1742. *De graecis illustribus linguae graecae literarumque humaniorum instauratoribus, eorum vitis, scriptis et elogiis libri duo*. London: Apud Hodium.
- Irigoin, J. 1996. "La contribution de l'Espagne au développement de la typographie grecque." *Minerva Revista de filología clásica*, 10: 59-76.
- Ito, S. 1980. *The Medieval Latin Translation of the Data of Euclid*. Tokyo: University of Tokyo Press.
- Jal, A. 1840. *Archéologie Navale*. 2 vols. Paris: A. Bertrand.
- \_\_\_\_\_. 1848. *Glossaire nautique. Répertoire polyglotte de termes de marine anciens et modernes*. Paris: Firmin Didot Frères.
- Kallendorf, C. 2002. *Humanist Educational Treatises*. Cambridge, MA: Harvard University Press.
- Katz, V.J. 1993. *A History of Mathematics*. New York: Harper Collins.

- Keyes, W. C. 1928. *Cicero. De Re Publica. De Legibus*. Cambridge, MA: Harvard University Press.
- King, M. 1986. *Venetian Humanism in an Age of Patrician Dominance*. Princeton, NJ: Princeton University Press.
- Kohl, B. 1992. "The Changing Concept of the Studia Humanitatis in the Early Renaissance." *Renaissance Studies* 6(2): 185-202.
- Kristeller, P.O. 1951. *The Modern System of the Arts: A Study in the History of Aesthetics*. Durham, NC: Duke University Press.
- \_\_\_\_\_. 1974. *Medieval Aspects of Renaissance Learning. Three Essays*. Durham, NC: Duke University Press.
- \_\_\_\_\_. 1979. "Humanism and Scholasticism in the Italian Renaissance." In *Renaissance Thought and Its Sources*, edited by P. O. Kristeller and M. Mooney, 85-105. New York: Columbia University Press.
- Labalme, P. 2008. *Venetia, città excelentissima. Selections from the Renaissance Diaries of Marin Sanuto*. Baltimore: The Johns Hopkins University Press.
- Lierd, W. R. 1987. "Giuseppe Moletti's 'Dialogue on Mechanics' (1576)." *Renaissance Quarterly* 40(2): 209-23.
- Lane, F. C. 1934. "Naval Architecture about 1550." *The Mariner's Mirror* 20: 24-49.
- \_\_\_\_\_. 1964. "Tonnage, Medieval and Modern." *The Economic History Review* 17(2): 213-33.
- \_\_\_\_\_. 1965. *Navires et constructeurs à Venise pendant la Renaissance*. Paris: J. Touzot.

- \_\_\_\_\_. 1973. *Venice: A Maritime Republic*. Baltimore: The Johns Hopkins University Press.
- \_\_\_\_\_. 1992. *Venetian Ships and Shipbuilders of the Renaissance*. London: The Johns Hopkins University Press.
- Layton, E. 1994. *The Sixteenth Century Greek Books in Italy. Printers and Publishers for the Greek World*. Venice, Italy: Hellenic Institute of Venice.
- Lee, J. A. 2005. "Dimitrios Doukas and the Accentuation of the New Testament Text of the Complutensian Polyglot." *Novum Testamentum* 47(3): 250-90.
- Legrand, É. 1885. *Bibliographie hellénique. Ou description raisonnée des ouvrages publiés par des Grecs au XV<sup>e</sup> et XVI<sup>e</sup> siècles*. 2 vols. Paris: Ernest Leroux.
- Lehman, L. Th. 1992. *Visione del Drachio*. Amsterdam: Private Publication.
- Lefaivre, L. 1997. *Leon Battista Alberti's Hypnerotomachia Poliphili: Re-cognizing the Architectural Body in the Early Italian Renaissance*. Cambridge: Massachusetts Institute of Technology.
- Lepori, F. 1980. "La scuola di Rialto dalla fondazione alla metà del Cinquecento." In *Storia della cultura veneta. Dal primo Quattrocento al concilio di Trento*. 3 vols. Edited by G. Arnaldi and M. Pastore Stocchi, 2: 538-605. Vicenza, Italy: Neri Pozzi Editore.
- Liddell, H. G., and R. Scott. 1953. *Greek-English Lexicon*. Oxford: Clarendon Press.
- Lindberg, D.C. 1992. *The Beginning of Western Science: The European Scientific Tradition in Philosophical, Religious, and Institutional Context, 600 BC to AD 1450*. Chicago: University of Chicago Press.

- Lindembrog, F. 1820. *P. Terentii carthaginensis afri comoediae sex*. 2 vols. London: R. Priestley.
- Logan, O. 1980. *Venezia: cultura e società, 1470-1790*. Roma: Veltro.
- Lowry, M. C. J. 1976. "The New Academy of Aldus Manutius: A Renaissance Dream." *Bulletin of the John Rylands University Library of Manchester* 58(2): 378-420.
- \_\_\_\_\_. 1979. *The World of Aldus Manutius: Business and Scholarship in Renaissance Venice*. Ithaca, NY: Cornell University Press.
- Lyell, J. 1917. *Cardinal Ximenes, Statesman, Ecclesiastic, Soldier, and Man of Letters, with an Account of the Complutensian Polyglot Bible*. London: Grafton & Co.
- Maccagni, C. 1980. "Le scienze nello Studio di Padova e nel Veneto." In *Storia della cultura veneta. Dal primo Quattrocento al concilio di Trento*. 3 vols, edited by G. Arnaldi and M. Pastore Stocchi, 3: 135-71. Vicenza, Italy: Neri Pozzi Editore.
- Magdaleno Martin, R. 1976. *Papeles de Estado: Venecia, siglos XV-XVI. Catálogo XXVI del Archivo general de Simancas*. Valladolid, Spain: Ed. Organismos Oficiales de la Administración.
- Mancini, G. 1882. *Vita di Leon Battista Alberti*. Firenze: Sansoni.
- Mandosio, J. 1998. "La classification des sciences et des arts à la Renaissance." Ph.D. diss., École Pratique des Hautes Études, Paris.
- Margolin, J.-C. 2002. "Érasme et Venice." In *L'eredità greca e l'ellenismo veneziano*, edited by G. Benzoni, 189-213. Venezia, Italy: Leo S. Olschki.
- Mariani, L. 1941. *Le Navi di Nemi nella bibliografia*. Roma: Fratelli Palombi.

- Marx, B. 1978. *Venezia – altera Roma? Ipotesi sull'umanesimo veneziano*. Venezia, Italy: Centro Tedesco di Studi Veneziani.
- Mauro, A. 1961. *Iacobo Sannazaro. Opere volgari*. Bari, Italy: Laterza & Figli.
- Mazzacurati, G. 1980. "Pietro Bembo." In *Storia della cultura veneta. Dal primo Quattrocento al concilio di Trento*. 3 vols, edited by G. Arnaldi and M. Pastore Stocchi, 2: 1-58. Vicenza, Italy: Neri Pozzi Editore.
- McGee, D. 2009. "The Shipbuilding Text of Michael of Rhodes." In *The Book of Michael of Rhodes: A Fifteenth-century Maritime Manuscript*. 3 vols. *Volume 3: Studies*, edited by P. Long, D. McGee, and A. M. Stahl, 211-42. Cambridge, MA: Massachusetts Institute of Technology.
- McManamon, J. 2001. "The Archeology of Fifteenth-century Manuscripts on Shipbuilding." *Institute of Nautical Archaeology Quarterly* 28(1): 17-26.
- Mercato, G. 1998. "Metodi di riduzione utilizzati fino alla prima metà del XVIII secolo." In *Navi di legno. Evoluzione tecnica e sviluppo della cantieristica nel Mediterraneo dal XVI secolo ad oggi*, edited by M. Marzari, 31-82. Grado, Italy: Lint.
- Miller, W. 1913. *Cicero. De officiis*. Cambridge, MA: Harvard University Press.
- Morrison, J.S. 1995. "Hellenistic Oared Warships 399-31 BC". In *Conway's History of Ship. The Age of the Galley. Mediterranean Oared Vessels since Pre-Classical Times*, edited by R. Gardiner, 66-77. London: Conway Maritime Press.
- \_\_\_\_\_. 1996. *Greek and Roman Oared Ships*. Oxford, UK: Oxbow Books.

- Morrison, J.S. and J.F. Coates. 1986. *The Athenian Trireme*. Cambridge, MA: Cambridge University Press.
- \_\_\_\_\_. 1996. *Greek and Roman Oared Warships*. Oxford, UK: Oxbow Books.
- Mott, L. 1997. *The Development of the Rudder. A Technological Tale*. College Station: Texas A&M University.
- Muir, E. 1981. *Civic Ritual in Renaissance Venice*. Princeton, NJ: Princeton University Press.
- Musler, J. 1538. *Oratio de liberalibus disciplinis cum iurisprudencia coniungendis*. Venetiis (Venice, Italy): sine nomine.
- Nader, H. 1978. "The Greek Commander Hernán Núñez de Toledo, Spanish Humanist and Civic Leader." *Renaissance Quarterly* 31(4): 463-85.
- Nani Mocenigo, M., ed. 1930. *Della milizia marittima, libri quattro, di Cristoforo da Canale*. Roma: Libreria dello Stato.
- Nardi, B. 1958. *Saggi sull'aristotelismo padovano dal secolo XIV al XVI*. Firenze, Italy: Sansoni Editore.
- \_\_\_\_\_. 1971. "Letteratura e cultura veneziana del Quattrocento." In *Saggi sulla cultura veneta del Quattro e Cinquecento*, edited by P. Mazzantini, 3-43. Padova, Italy: Antenore.
- \_\_\_\_\_. 1971a. "La scuola di Rialto e l'Umanesimo veneziano." In *Saggi sulla cultura veneta del Quattro e Cinquecento*, edited by P. Mazzantini, 45-98. Padova, Italy: Antenore.



- Nauert, C. G. 1995. *Humanism and the Culture of Renaissance Europe*. Cambridge, MA: Cambridge University Press.
- Novati, F. 1891-1911. *Epistolario di Coluccio Salutati*. 4 vols. Roma: Istituto Storico Italiano.
- Nuovo, A. 2007a. "Gian Vincenzo Pinelli's Collection of Catalogues of Private Libraries in Sixteenth-century Europe." *Gutenberg Jahrbuch* 82: 129-44.
- \_\_\_\_\_. 2007b. "The Creation and Dispersal of the Library of Gian Vincenzo Pinelli." In *Books on the Move: Tracking Copies through Collections and the Book Trade*, edited by G. Mandelbrote, 39-68. New Castle, UK: Oak Knoll Press and The British Library.
- Pade, M. 2007. *The Reception of Plutarch's Lives in Fifteenth-century Italy*. 2 vols. Copenhagen: Museum Tusulanum.
- Page, T.E. 1939. *Greek Mathematics*. 2 vols. Translated by I. Thomas. Cambridge: Harvard University Press.
- Pantera, P. 1614. *L'armata navale del capitano Pantero Pantar gentilh'huomo Comasco, et cavalliero dell'habito di Cristo, divisa in doi libri, ne i quail si ragiona del modo, che si ha a tenere per fomare, ordinare, et conservare un'armata marittima. Con molti avvertimenti necessarii alla navigatione et alla battaglia*. Roma: Appresso Egidio Spada.
- Parks, G. B. 1955. "Ramusio's Literary History." *Studies in Philology* 52:127-48.
- Paruta, P. 1718. *Degl'istorici delle cose veneziane, i quali hanno scritto per pubblico decreto*. 10 vols. Venezia, Italy: Appresso il Lovisa.

- Paternoster, Paolo. 1883. *Le scuole pubbliche a Venezia ai tempi della repubblica. Nozze Levi-Rava*. Venice, Italy: A spese dell'autore.
- Pedretti, C. 2007. *Leonardo architetto*. Milano, Italy: Mondadori Electa.
- Pertusi, A. 1970. "Gli inizi della storiografia umanistica del Quattrocento." In *La storiografia veneziana fino al secolo XVI. Aspetti e problemi*, edited by A. Pertusi, 269-332. Firenze: Leo S. Olschki.
- \_\_\_\_\_. 1980. "L'Umanesimo greco dalla fine del secolo XIV agli inizi del secolo XVI." In *Storia della cultura veneta. Dal primo Quattrocento al concilio di Trento*. 3 vols, edited by G. Arnaldi and M. Pastore Stocchi, 1: 177-264. Vicenza, Italy: Neri Pozzi Editore.
- Pigafetta, F. 1581. *Le Mechaniche dell'Illustrissimo Signor Guido Ubaldo De' Marchesi del Monte, nelle quali si contiene la vera dottrina di tutti gli istrumenti principali da mover pesi grandissimi con picciola forza, a beneficio di chi si diletta di questa nobilissima scienza et massimamente di capitani di guerra, ingegneri, architetti, et d'ogni artefice che intenda per via di machine far opre maravigliose, e quasi sopra naturali. Et si dichiarano i vocaboli et luoghi più difficili*. Venetia (Venice, Italy): Sanese.
- Pincus, D. 1992. "Venice and the Two Romes: Byzantium and Rome as a Double Heritage in Venetian Cultural Politics." *Artibus et Historiae* 13(26): 101-14.
- Piovan, F. 1995. "Vittore, Fausto." In *Dizionario biografico degli italiani*. 72 vols., edited by A. M. Ghisalberti, 398-401. Roma: Istituto della Enciclopedia Italiana.
- Pomey, P. 1973 "Plaute et Ovide architectes navals!" *MÉFRA* 85: 483-515.

- Proctor, D. V. 1987. "Astronomy, Astrology, and the Character of Shipbuilders." In *Ragioni antiche spettanti all'arte del mare et fabriche de vasselli*, edited by G. Bonfiglio Dosio, lxxxvii-xcii. Venezia, Italy: Il Comitato Editore.
- Proctor, R. E. 1990. "The Studia Humanitatis: Contemporary Scholarship and Renaissance Ideals." *Renaissance Quarterly* 43(4): 813-14.
- Pryor, J. H. 1995. "From Dromon to Galea: Mediterranean Bireme Galleys AD 500-1300." In *Conway's History of Ship. The Age of the Galley. Mediterranean Oared Vessels since Pre-classical Times*, edited by R. Gardiner, 101-16. London: Conway Maritime Press.
- \_\_\_\_\_. 2006. *The Age of the ΔΡΟΜΩΝ. The Byzantine Navy ca. 500-1204*. London: Brill.
- Queller, D. 1986. *The Venetian Patriciate: Reality versus Myth*. Urbana: University of Illinois Press.
- Raugei, A.M. 1988. *Echi della cultura lionese nella biblioteca di Gian Vincenzo Pinelli*. Roma: Edizioni dell'Ateneo.
- Renn, J., and M. Valleriani. 2001. *Galileo and the Challenge of the Arsenal*. Berlin: Max Plank Institute.
- Revilla Rico, M. 1917. *La Políglota de Alcalá. Estudio histórico-crítico*. Madrid: Imprenta Helénica.
- Reynolds, L.D. and N.G. Wilson, 1975. *Scribes and Scholars. A Guide to the Transmission of Greek and Latin Literature*. Oxford, UK: Clarendon Press.
- Rhodes, D. E. 1978. *Annali tipografici di Lazzaro de' Soardi*. Firenze: Leo S. Olschki.

- Richter, J. P., and C. Pedretti. 1977. *The Literary Works of Leonardo da Vinci*. Berkeley: University of California Press.
- Rieth, E. 2001. "Les illustrations d'un livre de recettes techniques d'architecture navale du milieu du XV<sup>e</sup> siècle." In *Pour une histoire du fait maritime. Sources et champ de recherche*, edited by C. Villain-Gandossi and E. Rieth, 81-104. Paris: CTHS Histoire.
- \_\_\_\_\_. 1998. "L'arquitectura naval." In *Excavacions arqueològiques subaquàtiques a Cala Culip*, edited by H. Palou, 115-89. 2 vols. Girona, Spain: Museu d'Arqueologia de Catalunya.
- Rivolta, A. 1914. *Contributo a uno studio sulla biblioteca di Gian Vincenzo Pinelli*. Monza, Italy: Artigianelli.
- \_\_\_\_\_. 1933. *Catalogo dei codici pinelliani dell'Ambrosiana*. Milano: Tipografia Pontificia Arcivescovile San Giuseppe.
- Rolfe, J. 1927. *Aulus Gellius. Attic Nights*. Cambridge: Harvard University Press.
- Romanin, S. 1853-1861. *Storia documentata di Venezia*. 10 vols. Venezia, Italy: P. Naratovich.
- Rose, P. L. 1969. *The Accademia Venetiana: Science and Culture in Renaissance Venice*. Firenze, Italy: Leo S. Olschki.
- \_\_\_\_\_. 1976. *The Italian Renaissance of Mathematics. Studies on Humanists and Mathematicians from Petrarca to Galileo*. Genève, Swiss: Droz.
- Rose, P. L., and S. Drake. 1971. "The Pseudo-Aristotelian Questions of Mechanics in Renaissance Culture." *Studies in the Renaissance* 18: 65-104.

- Ross, J. B. 1976. "Venetian Schools and Teachers Fourteenth to Early Sixteenth Century: A Survey and a Study of Giovanni Battista Egnazio." *Renaissance Quarterly* 29:521-57.
- Rossi, F. 2009. "Introduction to the Manuscript." In *The Book of Michael of Rhodes: A Fifteenth-century Maritime Manuscript*. 3 vols. *Volume 1: Transcription and Translation*, edited by P. O. Long, D. McGee, A. M. Stahl, xi-xlvii. Cambridge, MA: Massachusetts Institute of Technology.
- Russell, B. 1945. *A History of Western Philosophy and Its Connection with Political and Social Circumstances from the Earliest Times to the Present*. New York: Simon and Schuster.
- Sabellico, M. A. C. 1495. *De situ urbis Venetae, de praetoris officio et de viris illustribus*. Venetia (Venice, Italy): Damianus de Gorgonzola.
- Salopek, D. 2005. *De navigatione (O plovidbi)*. Zagreb, Croatia: Ex Libris.
- Sanuto, M. 1466-1536. *I diarii*. 58 vols., edited by R. Fulin. Bologna, Italy: Forni Editore.
- \_\_\_\_\_. 1880. *Cronachetta*. 8 vols., edited by R. Fulin. Venezia, Italy: M. Visentini.
- Sanuto, M. (the Elder, from Torsello). 1411. *Liber secretorum fidelium crucis super terrae sanctae recuperatione et conservatione, quo et terrae sanctae historia ab origine et eiusdem vicinarumque provinciarum geographica description continetur, cuius auctor Marinus Sanutus dictus Torsellus patricus venetus*. Honoviae (Hanau, Germany): Apud herede Ioannis Aubrii.
- Sarsfield, J.P. 1984. "Mediterranean Whole Molding." *The Mariner's Mirror* 70: 86-8.

- Scaglia, G. 1979. "A Translation of Vitruvius and Copies of Late Antiquity Drawings in Buonaccorso Ghiberti's Zibaldone." *TAPS* 69: 1-30.
- Schiavone, A. 2003. *L'Histoire Brisée: La Rome antique et l'Occident moderne*. Paris: Belin.
- Schmitt, C.B. 1984. *The Aristotelian Tradition and Renaissance Universities*. London: Variorum Reprints.
- Scranton, L.R. 1974. "Vitruvius's Arts of Architecture." *Hesperia* 43: 494-9.
- Segarizzi, A. 1916. "Cenni sulle scuole pubbliche a Venezia nel secolo XV e sul primo maestro d'esse." *Atti dell'Istituto Veneto di Scienze, Lettere ed Arti* 75(2): 637-65.
- Setton, K. 1956. "The Byzantine Background to the Italian Renaissance." *PAPS* 100(1): 1-76.
- Shapin, S. 1996. *The Scientific Revolution*. Chicago: University of Chicago Press.
- Shaw, T. 1995. "Oar Mechanics and Oar Power in Ancient Galleys." In *The Age of the Galley. Mediterranean Oared Vessels since Pre-Classical Times*, edited by R. Gardiner, 163-71. Annapolis, MD: Naval Institute Press.
- Sleeswyk, A., and L. Lehmann. 1982. "Pintle and Gudgeon and the Development of the Rudder." *The Mariner's Mirror* 68: 279-303.
- Sofroniou, A. 2003. *Moral Philosophy. The Ethical Approach through the Ages*. Swindon, UK: PsySys.
- Spezi, G. 1862. *Lettere inedite del cardinale Pietro Bembo e di altri scrittori del secolo XVI*. Roma: Tipografia delle scienze matematiche e fisiche.

- Strathern, P. 2003. *The Medici: Godfathers of the Renaissance*. London: Jonathan Cape.
- Tafari, M. 1984. *Renovatio urbis. Venetia nell'età di Andrea Gritti (1523-1538)*. Roma: Officina Edizioni.
- \_\_\_\_\_. 1985. *Venezia e il Rinascimento: Religione, scienza, architettura*. Torino, Italy: Giulio Einaudi Edizioni.
- \_\_\_\_\_. 1989. *Venice and the Renaissance*. Cambridge, MA: The Massachusetts Institute of Technology.
- Taisbak, C.M. 2003. *ΔΕΔΟΜΕΝΑ. Euclid's Data or the Importance of Being Given*. Copenhagen: Museum Tusulanum Press.
- Tarn, W.W. 1930. *Hellenistic Military and Naval Developments*. Cambridge, MA: Cambridge University Press.
- \_\_\_\_\_. 1939. "Alexander's Plans." *JHS* 59(1): 124-35.
- \_\_\_\_\_. 1985. "The Greek Warship." *JHS* 25: 137-56.
- Tassini, G. 1863. *Curiosità veneziane, ovvero origini delle denominazioni stradali di Venezia*. Venezia, Italy: G. Cecchini.
- Tenenti, A. 1962. *Cristoforo da Canal. La marine Vénitienne avant Lépante*. Paris: S.E.V.P.E.N.
- Teeuwen, M. 2003. *The Vocabulary of Intellectual Life in the Middle Ages*, edited by Comité international du vocabulaire des institutions et de la communication intellectuelle au Moyen Age. Paris: Brepols.
- Tiraboschi, G. 1822-1826. *Storia della letteratura italiana*. 9 vols. Milano: Società tipografica de' classici italiani.

- Travi, E., ed. 1992. *Lettere di Pietro Bembo*. 6 vols. Bologna, Italy: Commissione per i testi di lingua.
- Tucci, Ugo. 1964. "Architettura navale veneziana. Misure di vascelli della metà del Cinquecento." *Bollettino dell'Atlante Linguistico Mediterraneo*, 5-6: 277-93.
- \_\_\_\_\_. 1967. "Un problema di metrologia navale: la botte veneziana." *Studi Veneziani*, 9:201-46.
- \_\_\_\_\_. 2002. "La Grecia e l'economia veneziana." In *L'eredità greca e l'ellenismo veneziano*, edited by G. Benzoni, 139-56. Venezia, Italy: Leo S. Olschki.
- Ullman, B. L. 1955. *Studies in Italian Renaissance*. Roma: Edizioni di Storia e Letteratura.
- Valeri, D. 1958. *La Civiltà Veneziana del Rinascimento*. Firenze, Italy: Sansoni.
- Vendruscolo, F. 2005. "Dall'ignoto Falconio all'immortal Fausto." *AIΩN (AIŌN)* 27: 37-50.
- Vergani, R. 1991. "Le materie prime." In *Storia di Venezia dalle origini alla caduta della Serenissima. Temi: il mare*, edited by A. Tenenti and U. Tucci, 1285-312. Roma: Istituto della Enciclopedia Italiana.
- Versi, P. (di). 1991. *Raxion de' marinieri. Taccuino nautico del XV secolo*, edited by C. Conterio. Venezia, Italy: Comitato per la Pubblicazione delle Fonti Relative alla Storia di Venezia.
- Vredeveld, H. 2001. "Deaf as Ulysses to the Siren's Song: the Story of a Forgotten Topos." *Renaissance Quarterly* 54(3): 846-82.



- Walbank, F. W. 2002. *Polybius, Rome, and the Hellenistic World. Essays and Reflections*. Cambridge, MA: Cambridge University Press.
- Walz, C., ed. 1968. *Rhetores graeci ex codicibus florentinis, mediolanensibus, monacensibus, neapolitanis, parisiensibus, romanis, venetis, taurinensibus et vindobonensibus*. 10 vols. Osnabrück, Germany: Otto Zeller.
- Weber, E., ed. 1894. *Virorum clarorum saeculi XVI et XVII epistolae selectae e codicibus manuscriptis Gottingensibus edidit et adnotationibus instruxit Ernestus Weber*. Lipsiae (Leipzig, Germany): Teubner.
- Weinberg, B., ed. 1970. *Trattati di poetica e retorica del Cinquecento*. Bari, Italy: Giuseppe Laterza & Figli.
- Weiss, R. 1969. *The Renaissance Discovery of the Classical Antiquity*. Oxford, UK: B. Blackwell.
- \_\_\_\_\_. 1977. *Medieval and Humanist Greek*. Padova, Italy: Editrice Antenore.
- Westerhoff, A. 1742. *Pub. Terentii Afri comoediae sex ad fidem duodecimo amplius manoscrittorum codicum, et pluscularum optimae notae editorum recensitae, et commentario perpetuo illustratae*. 2 vols. Hagrae-comitum (The Hague, Netherlands): Apud Pterum Gosse.
- Wilson, N. W. 1988. "Vettor Fausto, Professor of Greek and Naval Architect." In *The Use of Greek and Latin: Historical Essays*, edited by A. C. Dionisotti, A. Grafton, and J. Kraye, 89-95. London: The Warburg Institute.
- \_\_\_\_\_. 1992. *From Byzantium to Italy. Greek Studies in the Italian Renaissance*. Baltimore: The John Hopkins University Press.

- Zamberti, B. 1505. *Euclidis Megaresis philosophi platonici mathematicarum disciplinarum janitoris*. Venetiis (Venice, Italy): In aedibus Ioannis Tacuino.
- Zeno, P. A. 1662. *Memoria de' scrittori veneti patritii ecclesiastici e secolari*. Venetiis (Venice, Italy): sine nomine.
- Zorzi, M. 2002. "Bessarione e i codici greci." In *L'eredità greca e l'ellenismo veneziano*, edited by G. Benzoni, 93-121. Venezia, Italia: Leo S. Olschki.

## Archival Material

(\* denotes documents examined by the author)

ASVe

\*Archivio Proprio Contarini, env. 25: *Visione di Baldissera Quintio Drachio*.

\*Archivio Proprio Contarini, env. 19: *Arte de far vasselli*.

\*Archivio Proprio Pinelli, env. 2 (former Miscellanea Codici , n. 125, FF 25).

\*Collegio, Notatorio, reg. 26, fol. 51r.

\*Consiglio di Dieci, Parti comuni, reg. 5, fols. 39v-40r.

\*Consiglio di Dieci, Parti secrete, reg. 1, folios not numbered.

\*Consiglio di Dieci, Parti secrete, reg. 1, fol. 31r.

\*Consiglio di Dieci, Parti secrete, reg. 1, fol. 62r.

\*Dieci Savi alle Decime, Condizioni, reg. 47, 48.

Indice 86ter 1, Matrimoni patrizi per nome di donna, 265.

\*Maggior Consiglio, Deliberazioni, reg. 28, fol. 77r.

\*Maggior Consiglio, Deliberazioni, Ursa, fol. 144r.

\*Patroni e Provveditori all'Arsenal, env. 1, fol. 11r.

\*Patroni e Provveditori all'Arsenal, env. 8, fol. 37v.

\*Patroni e Provveditori all'Arsenal, env. 133, fol. 107r.

\*Patroni e Provveditori all'Arsenal, env. 135, fol. 73r.

\*Patroni e Provveditori all'Arsenal, env. 136, fol. 68v.

\*Patroni e Provveditori all'Arsenal, env. 136, fol. 93v.

\*Patroni e Provveditori all'Arsenal, env. 136, fol. 94v.

\*Patroni e Provveditori all'Arsenal, env. 533: *Baldissera Quintio Drachio. Ricordi intorno la casa dell'Arsenal*.

\*Senato, Dispacci, Costantinopoli, string 3, folios not numbered, dispatch dated to 22 May 1568.

\*Senato, Dispacci, Costantinopoli, string 2-B, folios not numbered, dispatch dated to 4 October 1560).

\*Senato, Dispacci, Costantinopoli, string 6, folios not numbered, dispatch dated to 23 March 1573.

\*Senato, Dispacci, Costantinopoli, string 9, folios not numbered, dispatch dated to 4 April 1576.

\*Senato mar, reg. 18, fol. 115r.

\*Senato mar, reg. 14, fol. 141r.

\*Senato mar, reg. 14, fol. 48r.

\*Senato mar, reg. 21, fol. 141v.

\*Senato mar, reg. 21, fol. 160r.

\*Senato mar, reg. 21, fol. 161v.

\*Senato mar, reg. 26, fol. 100r.

\*Senato mar, reg. 26, fols. 160v-161r.

\*Senato mar, reg. 29, fol. 18v.

\*Senato mar, reg. 29, fol. 125r.

\*Senato mar, reg. 29, reg. 125v.

\*Senato mar, reg. 34, fol. 114r.

\*Senato mar, reg. 35, fol. 15r.

\*Senato mar, reg. 35, fols. 35v-36r.

\*Senato mar, reg. 35 fol. 42r.

\*Senato mar, reg. 36, fols. 43r-v.

\*Senato mar, reg. 36, fol. 72r.

\*Senato mar, reg. 36, fol. 72v.

\*Senato mar, reg. 36, fol. 193v.

\*Senato terra, reg. 1, fol. 193r.

\*Senato terra, reg. 15, fol. 36r.

\*Senato terra, reg. 17, fol. 117v.

\*Senato terra, reg. 17, fol. 118r.

\*Senato terra, reg. 20, fol. 132v.

\*Senato terra, reg. 20, fol. 159r.

\*Senato terra, reg. 20, fol. 159v.

\*Senato terra, reg. 26, fol. 55r.

\*Senato terra, reg. 26, fol. 103r.

#### BCVe

\*Cons. IX, d. 1-2, Cittadini veneziani, fol. 190r.

Ms. Gradenigo 170, fol. 66r.

#### BBL

\*Cotton ms., Titus A XXVI: *Libro di appunti di Zorzi Trombetta da Modon.*

\*Add. Ms. 38655, fol. 27r: Steffano de Zuanne. *L'Architettura navale.*

## BNM

\*123 D. 213: *Hoc pugillari Terentius numeris concinatus, et L(ucius) Victoris Fausti de comoedia libellus nova recognitione, litterisque novis continetur. Hasce Terentii fabulas censura cujusdam sane eruditi viri, sumptibusque assiduis imprimendas Lazarus Soardus curavit. Venetijs MDXI humanae salutis Anno mense Augusti Augustum initium auspicatus.*

\*Aldine 359 *Victoris Fausti Veneti Orationes quinque eius amicorum cura quàm fieri potuit diligenter impressae. Apud Aldi filios, Venetiis, MDLI.*

\*Miscellanea 2983: *Aristotelis Mechanica Victoris Fausti industria in pristinum habitum restituta ac latinitate donata. Venetiis: in aedibus Iodoci Badii.*

\*Ms. It., cod. 379 (=7588): *Alessandro Picheroni della Mirandola. Disegni di biremi, triremi, e quadriremi.*

\*Rari V, 678: Fausto, 1511, *M. T. Ciceronis tres de officiis libri, et aureum illud de amicitia senectuteque volumen vna cum paradoxis hoc habentur pugillari.*

## BNN

Neap. II.F.30, fol. 1r.

## LAM

Ms. MA334: *Libro di navigare.*

## ONB

Ms. Vindobon. Lat. 9737e, fol. 11r-v.

ULG

Hunter 424, fol. 323v.

**Excerpts from Sanuto's *Diaries***

V	col. 333 col. 592
VI	col. 117 col. 433
VIII	col. 384
XIV	col. 316 col. 324 col. 414 col. 415 col. 450
XV	col. 32 col. 168
XXV	col. 120
XXVI	col. 52 col. 107 col. 108 col. 110 col. 122 col. 127 col. 502-503
XXVIII	col. 430
XXXII	col. 37 col. 38

XXXIX	col. 322 col. 440
XLII	col. 765 col. 766
XLIX	col. 357
XL	col. 123
L	col. 147 col. 227 col. 343 col. 345 col. 346 col. 347 col. 363 col. 364 col. 560 col. 561 col. 566 col. 568
LI	col. 222 col. 286 col. 462 col. 464 col. 483 col. 506 col. 516
LII	col. 100 col. 101 col. 102 col. 346 col. 393 col. 594 col. 595



LIII

col. 18  
col. 118  
col. 194  
col. 337  
col. 349  
col. 352  
col. 353  
col. 382  
col. 396

## Classical and Medieval Latin Sources

Ar.

*Ra.* 1074

Arist.

*Mech.* 4.850b.10  
4.850b.10-29  
5.850b.30-851a.18

*Metaph.* 980a.22  
981b.30

*Ath. Pol.* 46.1

August.

*Conf.* 5.4.7  
13.15.16

*De civ. D.* 5.11

*Exp. ad Ps.* 45.7

Aul. Gel.

*Noct. act.* 13.17

Boeth.

*De inst. arith.* 1.23-26

Cic.

*Fin.* 5.18.48  
5.18.49  
5.19  
5.26

*Leg.* 1.26  
1.44  
1.45

*Off.* 1.11  
1.13  
1.28-29

	1.50
	3.46
	3.89
	<i>Orat.</i> 1.53
	3.15.58
	3.32.127
	<i>Leg. Man.</i> 4.9
	<i>Pro Archia</i> 2.20
	3.33
	<i>Sen.</i> 20.72
	<i>Tusc.</i> 1.98
	2.49
	5.39
	5.7
	<i>Verr.</i> 1.3
Colum.	
	<i>Rust.</i> 1.4
D. L.	
	<i>De clar. Phil. Vitae</i> 1
	4
	4.4
	5
	7
	9
D. S.	
	14.41.3
	14.42.2
	14.44.6
Geor. Pach.	
	<i>Progymn.</i> 585.29-586.4
Hdt.	
	3.39.3
	3.44.2

- 6.8.
- Hor.  
*Ep.* 1.2.17-18  
 1.2.17-22
- Isid.  
*Etym.* 19.8  
 19.9
- Nicom.  
*Ar.* 1.1-5
- Nonius Marcellus  
 13.134
- Ov.  
*Her.* 16.107-18
- Pl.  
*Plt.* 258d  
 259e  
*R.* 439d  
*Ti.* 69e-70e
- Plaut.  
*Mil.* 915-21
- Plin.  
*HN* 7.57  
 9.8  
 32.1
- Pl.  
 1.2  
 1.6.9
- Plu.  
*Publ.* 16  
 17  
*Them.*
- Poll.  
*Onom.* 1.87

1.120

Plb.

1.20.8-16  
 1.21.1-2  
 1.26.7

Quint.

*Inst.* 12.1.1

Sallust.

*Ad Caes.* 1.2

Seneca

*Ep.* 4.31.2  
 88.7

Thomas Aquinas

*Summa Theologiae* 3a  
 10  
 15

Thuc.

2.93.2.

Ugo of San Vittore

*De tribus diebus* 7. 3

Val. Max.

3.2.1  
 3.3.1  
 4.7.2  
 5.3.3  
 5.6.3  
 6.5.2  
 6.9.3  
 8.7.14  
 8.14.1

Veget.

*Mil.* 4.34

Verg.

*Aen.* 5.116

Vitr.

*De arch.* 1.1.1  
1.1.3  
1.2.1  
1.2.2  
1.2.4  
3.1.1  
3.1.2

APPENDIX I  
 ARCHIVAL DOCUMENTS AND LITERARY SOURCES ON  
 VETTOR FAUSTO' S QUINQUEREME

**Document 1:** ASVe, Consiglio di Dieci, Parti secrete, reg. 1, fol. 31r (23 September 1525)

È stato alla presentia nostra el fidel nostro Venetian Dominus Vettor Fausto che ne ha mostrato uno modello de una galia quinquere, zoè che vuoga remi cinque per banco, qual esta tractata et conserata da li prothi nostri del Arsenal, è ben conveniente uno navilio de tanta securità al Stato nostro da mar come saria la dicta quinquere de haverne, et nel Arsenal nostro et insieme, et de retener a' li servitii nostri dicto Dominus Vettor.

Landarà parte che per autorità de questo conseio sia ordinato ai Proveditor et Patroni nostri del Arsenal che debano deputer uno volto dove se habi ad levar la dicta quinquere, et li sia dato el modo et aiuto de farla. Preterea sia scritto al orator nostro in Roma che debi supplicare la beatissima pontificia con un gratification nostra sia contenta proveder de ducati 500 de intrada de beneficii de la relligion de Rhodi, over de altra sorte beneficii primi vacanti al dicto Dominus Vettor. Et presa sarà la presente parte sia obligato dicto Dominus Vettor de metter in vera executione la voga dela dicta quinquere et mostrarla al Provededor, Patroni, et prothi nostri del Arsenal. Et essendo

approbata per i experti nostri sia commenzata dicta quinquere me et compita. Et sia preso che in questo mezo finochè vachino dicti beneficii sia dato al dicto Dominus Vetor per sustenation sua ducati 100 al anno quali habino ad cessar per rata come vacherano dicti beneficii, et tal provision debi commenzare dal iorno che sarà compita del tuto la dicta quinquere me et congnessuta cum vera experientia che la vuoga reussì et sii laudata et approbata. Pretea sia data licentia al dicto Dominus Vetor chel possi portar arme lui et uno fameio che sia cum lui per segurtà de la persona sua, come el ne ha supplicato per molti rispetti convenienti.

De parte \_\_\_\_\_ 17 \_\_\_\_\_ 16

De non \_\_\_\_\_ 7 \_\_\_\_\_ 8

Non synceri \_\_\_\_\_ 1 \_\_\_\_\_ 1

Nihil captum quia  $\frac{3}{4}$  requiruntur

Secretum impositum



**Document 2:** ASVe, Consiglio di Dieci, Parti secrete, reg. 1, folios not numbered. On the reverse of the last folios there is written “Request by [Vettor] Fausto” (*Supplica del Fausto*)

Serenissimo Principe et Excellentissimi Signori.

Serenissimo Principe, vedendo io Vettor Fausto che le occupation de la Sublimità Vostra sono di sorte che non lassa che ‘l caso mio sia terminato, nè messa la parte che mi era stà promessa, credo non esser inconveniente cum questa mia scriptura redur in mente de la Sublimità Vostra et de questi Excellentissimi Signori il caso mio. Sapi, dunque, Vostra Sublimità, che già 7 anni io voluntieri ritornai in questa città et fui contento di lezer lettere greche cum la mità del salario che poteva haver da Lucchesi, Ragusei, come apar per istrumenti pubblici, non per altro se non per monstrar alla Sublimità Vostra quelli che tutto il tempo de la vita mia cum molti travagli, pericoli, et longa fatica per il mondo haveva acquistato, perchè praticando cum marinari de diverse nation, zoè Cathelani, Provenzali, Normandi, Biscaini, Zenovesi, et altri, et havendo cercato tutte quasi le marine de Spagna, Francia, Italia et altre, parlando cum diversi capitanei, et tra li altri Piero Navaro, Pier Jam, el Biassa, el Gobo Dalmatin, el Doria, et cum li primi prothi de Napoli, Genoa, et che già sono da Pisa, tandem è ritrovato che la galìa grande et presta qual era la quinquere me che usavano romani ne le guerre, sì per la sua voluntà come perchè la poteva star sul mar ad ogni fortuna et tempo ruzo, seria signora de la marina et bateria ogni altro legno; il modello de la qual galìa havendolo facto de mia man secondo le misure ritrovate ne li libri greci antiquissimi, io venni in Collegio

presenti tutti quelli Excellentissimi Signori cum tutti li prothi di l'Arsenal vostro, et lo apresentai dicto modello, et li dissi che tal galia haveva queste condition: che la potea portar uno pezo di artellaria de 15 et più miara ultra li altri sui, la prova che butando 100 libre di ferro cum tanta polvere sempre quanto balla per la sua debita longeza saria sufficiente a ruinar senza periculo suo ogni possente navilio; et per esser assai grande la potria star a ferro, et far le volte in mar dove stesseno altri grossi legni; seria etiam de incredibel avantazo a la battaglia da mar. Item, per la sua bona fortuna, et conveniente numero di remi, la provezaria et andaria almanco a par a par cum le gagliarde sotil. Tutte queste condition io promissi che haveria la dicta galia. Li prothi, veramente, di la Sublimità Vostra havendo voluto veder le misure sue et quelle ben considerar, disseno che li faria gli effecti sopraditti et seria presta, se io li metesse la voga tal che tutti li remi operassino, confessano non lo saper far loro. Allora io me ofersi di far talmente che quelli vederiano che 'l quinto remo vogeria meglio di quel che fa al presente il terzo, cum questo che la Sublimità Vostra pur facesse haver dal Pontefice, per esser cosa di comun utile a la Christianità, beneficii per ducati 500 de intrada de la Religion de Rodi over altri; et fra questo mezo mi desse provision di ducati 150 a l'anno. Dove per la Sublimità Vostra et per quelli Excellentissimi Signori fu monstrata grandissima promptezza di voler meter tal parte; tamen nulla fin hora vedo esser stà facto. Al presente, veramente, intendendo che la Sublimità Vostra desiderosa di haver legni di tal sorte che possino batar le barze de corsari di ponente, vol far nave cum tanta sua spesa, item li offero la sopraditta galia quinquere me che farà tutti li effecti sopradicti; il che niuna di le galie de la Sublimità Vostra li po' far nè sotil nè bastardetta per esser piccola, nè grossa nè

bastarda per non poter montar a vento col provizar. Et dico volerli monstrar in actual voga come 5 homeni insieme vogeranno meglio tutti 5 che non fanno al presente li tre di le galie sotil; et se la dicta non sarà laudata da li pratici, et che cum l'occhio la Sublimità Vostra non vedi l'effecto che li prometto, non voglio haver niente. Et per parlarli ancor più chiaramente, quando el si guardi a spesa prima che si fazi el corpo de la ditta galia, quella me dii una bastarda del suo Arsenal, et lassi che io la conzi a mio modo, et li meti la voga secundo la sua portada per esser bassa in pontal. Vostra Sublimità vederà quanto avantazo sarà da quella a le altre ancora che la non sia proportionata; per il che si potrà comprender quel che seria la quinquere me cum tutte le sue proportion, remetendo poi facta galia a description di Vostra Sublimità disminuir il premio parendoli che l'artificio nol meritasse; il qual spero li parerà meravigliosamente grande et bello. Queste, Serenissimo Principe et Excellentissimi Signori, son le cose che un vostro servitor ha zercato per il mondo, et cum l'adiuto di le scripture antique de greci et da romani tandem ha trovato, et le apresenta a la Sublimità Vostra, le qual saranno de grandissima reputation, beneficio, et segurtà de questa amplissima città. Quella adunque non fazi che 'l pari, che, questi Excellentissimi Signori li quali portano il vanto et laude appresso tutto il mondo di li più sapientissimi et peritissimi de la guerra da mar, non si habino dignato di voler veder et haver servitor di tanta importantia che un suo povero servitor li ha apresentato, perchè certo poche tal galie sarian suficiente a ruinar ogni potente armata de inimici; suplicando reverentemente, che quando li piacque de exaudirmi la si degni far che io cum uno famiglio possiamo portar arme per li respecti che potesseno esser notissimi alla Sublimità Vostra.

**Document 3:** ASVe, Consiglio di Dieci, Parti secrete, reg. 1, fol. 62r (23 May 1526)

Che la supplication de Dominus Victor Fausto hora lecta continente la oblation de far la gallia quinquere me sia remessa al collegio nostro qual possi venir cum le opinion sue al conseio nostro de pregadi per deliberare quanto li parera, exceptuando perhò el darli licentia de le arme per esser cosa spectante a' questo conseio.

De parte \_\_\_\_\_ 10 \_\_\_\_\_ 9

Volunt che la oblation de Dominus Vetor Fausto sia acceptata et che li sia data la commodità el domanda per far la gallia quinquere me, et visto reussir per experientia quanto el se offerisse, li sia usata quella recognition parerà a' questo conseio.

De parte \_\_\_\_\_ 10 \_\_\_\_\_ 10

De non \_\_\_\_\_ 8

Non synceri \_\_\_\_\_ 1 \_\_\_\_\_ 10

## APPENDIX II

GLOSSARY OF VENETIAN NAVAL AND NAUTICAL TERMS<sup>523</sup>

(\* terms used in the *Misure di vascelli*, fols. 5r-6v)

Legend:

fem. = feminine form  
 loc. = locution  
 masc. = masculine form  
 n. = noun  
 pl. = plural form  
 sing. = singular form  
 v. = verb

**A**

*Acciurmar/azzurmare*: v. To provide a ship with crew.

*Achordamento*: n. sing. masc. Rigging. See also *Chorda*.

*Agugliotto*: n. sing. masc., pl. *agugliotti*. Pintle. See also *Cancaro*.

*Alboro/albero*: n. sing. masc., pl. *albori/alberi*. Mast.

*Alboro di mezo*: n. sing. masc. Main mast.

*Alboro di proda*: n. sing. masc. Mizzen mast. See also *Alboro di trinchetto*.

*Alboro di trinchetto*: n. sing. masc. Mizzen mast. See also *Alboro di proda*.

*Alzana*: n. sing. fem., pl. *alzane*. Cable used to tow small boats.

---

<sup>523</sup> This Glossary is based mostly on archival research conducted by the author and on Jal, A. 1848. *Glossaire nautique. Répertoire polyglotte de termes de marine anciens et modernes*. Paris: Firmin Didot Frères.

*Amainare*: v. To furl a sail.

*Amante*: n. sing. masc., pl. *amanti*. Thick rope used to hang the yard.

*Amarra*: n. sing. fem., pl. *amarre*. Mooring cable.

*Ampolletta*: n. sing. fem., pl. *ampollette*. Sand clock.

*Anccura*: n. sing. fem., pl. *anccure*. Anchor.

*Anchino*: n. sing. masc., pl. *anchini*. Ropes used to fasten the yard to the mast.

*Anco/ancho*: n. sing. masc. See *Anchino*.

*Antenna*: n. sing. fem., pl. *antenne*. Yard.

*Apostizzo/aposticcio*: n. sing. masc. See *Postizzo*.

*Armiraio*: n. sing. masc. Admiral.

\* *Asta*: n. sing. fem., pl. *aste*. Wooden rods placed vertically at the extremities of the *carena* (or baseline). Usually followed by the terms *da poppa* (sternpost) or *da prora/prova* (stem).

## **B**

*Bachalare/baccalare*: n. sing. masc., pl. *bachalari/baccalari*. Outrigger knee.

*Banco/bancho*: n. sing. masc., pl. *banchi*. Rower's bench.

\* *Bocca*: n. sing. fem. The maximum breadth of a ship taken at the midship frame.

*Bruscha*: n. sign. fem. Wooden stick or gauge on which the increments generated by geomtric progression were marked.

*Buonevoglie*: n. pl. masc. Volunteer rowers.

## C

\* *Calcagnol*: n. sing. masc., pl. *calcagnoli*. The gripe placed at the forward and after extremities of the keel (see *Colomba*).

*Calcese*: n. sing. masc., pl. *calcesi*. Crow's nest.

*Cancarol/Ghanghero*: n. sing. masc., pl. *cancare/gangheri*. Pintle.

\* *Campo*: n. sing. masc., pl. *campi*. Station, location for frame placement.

\* *Cao*: n. sing. masc., pl. *cai*. Literally meaning head, but denoting a terminus point in measurements.

\* *Cao de sesto*: n. sing. masc. Location of the last molded frame.

*Carena*: n. sing. fem. Wooden timbers on which the shipwright placed the keel and built the ship. In manuscripts, the *carena* is referred to as the base line.

*Collo de la lata*: n. sing. masc., pl. *colli de le latte*. Upward curving extension of the deck beam that supports the outrigger knee (see *Bachalare*).

\* *Corba*: n. sing. fem., pl. *corbe*. Floor timber of a frame (see: *Madiere*).

*Corba codiera*: n. sing. fem. The last molded frame.

*Corba di mezo*: n. sing. fem. The midship frame.

*Corsia*: n. sing. fem. Central gangway.

\* *Costado*: n. sing. masc. Skeletonwork of a ship, frames.

*Coverta/coperta*: n. sing. fem. Deck.

*Cugno*: n. sing. masc. Wedge, also known as *schagion*. It is one of the geometrical methods used in designing the narrowing and rising of a ship's frame. It is better known as the "incremental triangle." See *Scagion*.

**D**

\* *Dedo*: sing. masc., pl. *deda*. Finger. It corresponds to 1/6 of a foot (*deda grosso*, big finger), or to 1/14 of a foot (*deda sottile*, small finger) (see: *Piede*).

**F**

\* *Ferir*: n. sing. masc. The distance between the last molded frame and the endpost.

*Forcame*: n. pl. masc. Futtocks.

**G**

*Giogo/gioco*: n. sing. masc., pl. *gioghi/giochi*. See *Zovo*.

*Gomena*: n. sing. fem., pl. *gomene*. Hawser.

**H**

\* *Hasta*: n. sing. fem., pl. *haste*. See *Asta*.

*Homo da remo*: n. sing. masc., pl. *homini da remo*. Rowers.

**L**

\* *Lata*: n. sing. fem, pl. *late*. Deck beam.



**M**

\* *Mezzaria*: n. sing. fem. Center line.

*Madiere*: n. sing. masc., pl. *madieri*. Frame. See also *Magiere*.

\* *Magiere/magiori*: n. sing. masc., pl. *magieri/magiori*. Frame.

*Maistra*: n. sing. fem., pl. *maistre*. Stringer.

*Mezo redondo*: n. sing. masc. Half circle, better known as “half-moon.” It was one of the geometrical method employed in designing the narrowing and rising of ship’s frames.

*Morello*: n. sing. masc., pl. *morelli*. Gauge, measuring rod.

**O**

\* *Oro*: sing. masc., pl. *ori*. Edge. Term used in recording ship to indicate a measurement to be taken along an edge.

**P**

*Pala*: n. sing. fem., pl. *pale*. Blade of an oar.

*Palada*: n. sing. fem., pl. *palade*. Stroke of the oar.

\* *Palmetta*: n. sing. fem., pl. *palmette*. Distance between the yoke (*zovo*) and the post, corresponding to the foredeck and afterdeck.

*Paraschossola*: n. sing. fem., pl. *paraschossole*. Bilge strake.

\* *Partison*: n. sing. masc. Portion of the hull consisting of the frames that are narrowed and/or raised by means of geometrical methods.

\* *Passo*: n. sing. masc., pl. *passa/passi*. A measure of length corresponding to five Venetian feet.

*Pavion*: n. sing. masc. Scribe board for shaping the ship drawn in a 1:1 scale on the floor (*pavion*) of the mold-loft.

*Pennone*: n. sing. masc., pl. *pennoni*. Arm of the yard.

*Piano*: n. sing. masc. Flat portion of a floor timber (see *Corba*).

*Piede/pie'*: n. sing. masc., pl. *piedi/pie'*. Foot; the basic unit of length in the Venetian mensuration system. It corresponds to 34.7735 cm.

\* *Pontal*: n. sing. masc. Depth in the hold.

\* *Poppa*: n. sing. fem. Stern.

\* *Poselese*: n. sing. masc. A mark denoting a specific location of timbers or features. In Venetian shipbuilding manuscripts the *poselese* indicates the location of the gripe (*poselese del calcagnol*), of the futtock (*poselese del magier di bocca*), and of the turn of the bilge (*poselese della paraschossola*).

*Postizzo*: n. sing. masc. Outrigger.

*Proda*: n. sing. fem. See *Prora*.

\* *Prora*: n. sing. fem. Bow.

\* *Prova*: n. sing. fem. See *Prora*.

## R

*Ramo*: n. sing. masc. Futtock.

*Remo*: sing. masc., pl. *remi*. Oar.

*Ruota/ruoda*: sing. fem., pl. *ruote/ruode*. Post.

## S

*Scagion*: n. sing. masc. Wedge, also known as *schagion*. It is one of the geometrical methods used in designing narrowing and rising of a ship's frame. It is better known as the "incremental triangle." See *Cugno*.

*Schaza/scassa*: n. sing. fem., pl. *schaze/scasse*. Mast step.

*Schorer del sesto*: loc. The process of designing a ship's frame by moving the mold (*sesto*) so that the exact flat portion of the frame to be narrowed can be calculated.

*Sentina*: n. sing. fem., pl. *sentine*. Bilge pump.

\* *Sesto*: n. sing. masc., pl. *sesti*. Mold.

\* *Slanzo*: n. sing. masc. Rake. Refers to the overhang of the endpost.

*Speron*: n. sing. masc. Spur at the bow.

## T

*Timonera/timoniera*: n. sing. fem. Rudder.

*Triganto*: n. sing. masc. Transom.

*Trizuola*: n. sing. fem., pl. *trizuole*. Rope used in a shipyard in designing the midship frame (see: *Corba di mezo*) and the mold (see: *Sesto*).

*Tuola/ tola*: n. sing. fem., pl. *tuole/tole*. Planks.

**V**

*Voga*: n. sing. fem. Rowing method.

**Z**

*Zenta*: sing. fem., pl. *zente*. Wale.

\* *Zovo/zuovo*: n. sing. masc., pl. *zovi/zuovi*. Fore and aft yoke.

## VITA

Lilia Campana

Department of Anthropology  
 Texas A&M University  
 College Station, TX 77843-4352  
 liliacampana@neo.tamu.edu

**Education**

- 2003 B.A., Classics and Archaeology, University of Urbino (Italy), *Summa cum Laude*.
- 2010 M.A., Anthropology, Nautical Archaeology Program, Texas A&M University, G.P.A. 4.00.

**Archaeological Fieldwork Experience**

- 1996-1998 Participant, Paleolithic tomb at Lavello (Italy). Director: Dr. Cipolloni Mariella.
- 1999-2001 Participant, Punic *tofet* (cemetery) at Monte Sirai, Sardinia (Italy), Director: Dr. Bartoloni Piero.
- 2001-2003 Assistant Director, Roman site at Fossombrone (Italy). Director: Dr. Mario Luni.
- 2005-2006 Participant, Underwater Excavations at Ustica. Director: Dr. Giuliano Volpe.

**Professional Experience**

- 2009-present Research Assistant, Nautical Archaeology Program, Department of Anthropology, Texas A&M University. Supervisor: Dr. Cemal Pulak.
- 2009-present Director of *The Nicolò Sagri Project* (C.M.A.C.-University of Zadar).
- 2007-present Research Associate, Institute of Nautical Archaeology.
- 2007-present Archival Researcher
- 2007-2009 Research Assistant, Nautical Archaeology Program, Department of Anthropology, Texas A&M University. Supervisor: Dr. Filipe Castro.