

Berlinghieri's Geography Unveiled

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Colophon

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PREFACE

During the Italian Renaissance a renewed interest in science and ancient history developed. A part of this ancient knowledge was cartographic. The rediscovery of the *Geographia* or *Cosmographia* called manuscript by the cartographer Ptolemy in combination with the discovery of book printing sparked a production of atlases. Berlinghieri's *Geography* is one of them. We researched this edition which led to our book *Berlinghieri's Geography unveiled*. The Florentine Francesco di Niccolò Berlinghieri's *Geography* is one of the first atlases with separately printed maps, only preceded by the atlases printed in Bologna and Rome, in respectively 1477 and 1478. It is printed in 1482, the same year as the atlas in Ulm. Berlinghieri wrote his text for the *Geography* in vernacular language instead of Latin. He constructed it as a poem in *terza rima*, which was also used for Dante's *La Divina Commedia*.¹ The *Geography* contains the earliest printed modern maps of Italy, Spain, and France.² In addition to the printed edition of Berlinghieri's atlas, two manuscript versions of his atlas have been preserved. The one, nowadays present in the Vatican City, belonged to Federico d'Urbino, to whom the *Geographia* was dedicated. The other manuscript, previously belonging to Lorenzo de Medici has been preserved in Milan.³ Both are lavishly illuminated.⁴ A small number of printed copies has comparable illuminations.⁵ Most of them have come into the hands of and have been preserved in the libraries of very renowned and high-ranking people of the time.⁶ Where does Berlinghieri's *Geography* come from? Why are we interested in its story? It all began with the discovery of beautifully coloured maps from a Rome *Cosmography* edition, heightened with gold. The question was, to which edition do these maps belong to? We found no clear answers in the literature and among experts. Therefore, we decided to start a research project ourselves. It resulted in two publications about the different Rome editions of Ptolemy's *Cosmography*.⁷ At the end of this research, enthused by our findings and because of the lack of unequivocalness in the literature about Berlinghieri's *Geography*, we decided to study this work as well. The first impression was promising and called for further investigation. We saw potential in another research project and expected new findings, based on the experience gained while studying the Rome *Cosmography* editions.

The fascination for the earliest printed maps and atlases arose from contact with Jaap van den Bovenkamp, the owner of an antiquarian bookstore in my hometown. He has a fascination for maps in general and Ptolemy in particular. In comparison with the highly decorative beauty of the maps of the Dutch Golden Age, the attraction of Ptolemy's maps is much more hidden and subdued. One must first acquire knowledge. If you do that then you will find pure beauty. The appreciation becomes deeper and greater, as with more things in life that you invest in. We are not alone in this, as copies from Ptolemy's maps by Mercator were still printed and published 250 years later in 1730 by Wetstein in Amsterdam.⁸ Maps first became known to a wider public through printing, just like knowledge in general during the Renaissance. Atlases were created during the early days of book printing and were the first books with

¹ Sean Roberts, *Cartography between cultures: Francesco Berlinghieri's Geographia of 1482* (Michigan 2006), p. 4.

² Claudius Ptolemaeus, *Francesco Berlinghieri Geographia Florence 1482*, with an introduction by Raleigh A. Skelton (Amsterdam 1966), p. XII.

³ Biblioteca Apostolica Vaticana, shelfmark Urb.lat.273; Biblioteca Nazionale Braidense Milano, shelfmark AC.XIV.44; The manuscript Urb.lat.273 in the Vatican Library can be consulted digitally: https://digi.vatlib.it/view/MSS_Urb.lat.273; In this book we will use the words *Cosmographia* and *Geographia* for the manuscripts and *Cosmography* and *Geography* for the printed copies.

⁴ Francesco Carta, *Codici corali e libri a stampa miniati Della Biblioteca Nazionale di Milano*, (Roma 1891), pp. 93-100.

⁵ Raphaele Tauci, 'La geografia del Berlinghieri della Biblioteca Alessandrina di Roma', *La Bibliofilia*, 69, (1967), pp. 69-73.

⁶ Consiglio regionale del Piemonte, Biblioteca Nazionale Universitaria di Torino, Centro Studi Piemontesi, Fondazione CRT, *Berlinghieri Geografia* (Torino 2006), p. 28, 43; Adolf Deissman, 'Forschungen und Funde im Serai. Mit einem Verzeichnis der nichtislamischen Handschriften im Topkapu Serai zu Istanbul', *Imago Mundi*, 1 (1935), pp. 74-5.

⁷ Robert H.J. Peerlings, Frans Laurentius, Jaap van den Bovenkamp, 'The watermarks in the Rome editions of Ptolemy's *Cosmography* and more', *Quaerendo* 47, (2017), pp. 307-27; Robert H.J. Peerlings, Frans Laurentius, Jaap van den Bovenkamp, 'New findings and discoveries in the 1507/8 Rome edition of Ptolemy's *Cosmography*', *Quaerendo* 48, (2018), pp. 139-62.

⁸ Henry N. Stevens, *Ptolemy's Geography* (Amsterdam 1972), p. 62.

such large illustrations. They were printed from wood blocks or copper plates. The creators and printers of these atlases were pioneers, such as Steve Jobs and Elon Musk nowadays. The books printed before 1500, known as incunabula, represent the abandonment of the dark days of the Middle Ages and are part of the onset of humanism.⁹ Atlases, among other things, gave rise to the great voyages of discovery. Columbus had a Rome *Cosmography* atlas, edition 1478, with him during his voyage leading to the discovery of America. It has been preserved with personal notes in Madrid.¹⁰ Most of all, these incunable atlases are part of important human cultural heritage.

The fascination with the subject and these incunable atlases, in combination with the questions that arose, led to conversations with the second important person. He is co-responsible for this book. In the abovementioned antiquarian bookstore, I met Frans Laurentius, an art historian with a great interest in and knowledge of paper and watermarks.¹¹ He taught me a lot about paper, watermarks, printing techniques, bookbinding, ink, and the production of books, as well as paper research. Frans published extensively about art, paper, watermarks, and pottery. His most important works include a thesis about Clement de Jonghe and a number of catalogues about watermarks.¹²

I am an orthodontist, and my name is Robert Peerlings. I have lived in Middelburg, a town in the Netherlands, since 1991. Nowadays it is a downsized version of Amsterdam but at the end of the fifteenth century the difference was much smaller. After Amsterdam it was the second most important town for the VOC.¹³ Residing in this environment, an interest in history grew. I wanted to understand my hometown better, as well as culture and history in general. Professionally, I wrote a dissertation on an orthodontic subject in 1992.¹⁴ More recently I set up and executed a multi-practice clinical trial, in cooperation with the Radboud University Nijmegen. It resulted in a publication in 2017 in one of the leading scientific journals in dentistry.¹⁵ In the intervening period, I wrote some other scientific publications on orthodontics.¹⁶ In 2017 and 2018, the already mentioned articles about the Rome editions of Ptolemy's *Cosmography* were published.¹⁷ My interest together with the story outlined above and meeting Jaap and Frans, have led to the book you are now reading.

Although the subject of this book is an atlas, the nature of our book is more book-historical than cartographic. From the outside, both are small worlds. From the inside, the opposite seems to apply. With this book we want to reach as wide an audience as possible. We focus on researchers with interest in incunabula, watermarks, paper history, early printing, humanities, and art. We also want to reach auction houses, map dealers, map collectors, map collectors' associations, libraries, and other institutions in possession of incunabula, maps, and atlases, particularly Berlinghieri's *Geography*. We would also like to address lay people and students. Therefore, for connoisseurs, already known facts will nonetheless be described. We would like to inform and enthuse interested people about cartography, book history, and the almost infinite possibilities of studying these subjects. The necessary material is omnipresent in libraries and museums around the world.

Already, much has been written about the many questions regarding the *Septe Giornate della Geographia* by the Florentine Francesco di Niccolò Berlinghieri. However, a lot of them remain

⁹ Incunabula can be searched in the Incunabula Short Title Catalogue of the British Library: https://data.cerl.org/istc/_search, or the Gesamtkatalog der Wiegendrucke of the Staatsbibliothek zu Berlin: <https://www.gesamtkatalogderwiegendrucke.de>

¹⁰ Claudius Ptolemaeus, *Cosmographia Roma 1478*, with an introduction by Raleigh A. Skelton (Amsterdam 1966), p. X.

¹¹ Theo Laurentius, Frans Laurentius, *Watermarks 1600-1650 found in the Zeeland Archives* (Houten 2007); Theo Laurentius, Frans Laurentius, *Watermarks 1650-1700 found in the Zeeland Archives* (Houten 2008).

¹² Frans Laurentius, *Clement de Jonghe (ca. 1624-1677) Kunstverkoper in de Gouden Eeuw*. (Houten 2010); Theo Laurentius, Frans Laurentius, *Italian Watermarks 1750-1860* (Leiden/Boston 2016); Theo Laurentius, Frans Laurentius, *Watermarks from the south-west of France, 1560-1860* (Leiden 2018); Laurentius, op. cit. (n. 7, 11).

¹³ Jonathan I. Israël, *The Dutch republic. Its rise, greatness and fall, 1477-1806* (Oxford 1995), pp. 119-22, 362.

¹⁴ Robert H.J. Peerlings, *Orthodontie en dento-faciale esthetiek: het effect van orthodontische behandeling op het uiterlijk* (Middelburg 1992).

¹⁵ Willemijn W. Penning, Robert H.J. Peerlings, Jan D.M. Govers, Robine J. Rischen, Kauter Zinad, Ewald M. Bronkhorst, Hero H. Breuning, Anne Marie Kuijpers-Jagtman 'Orthodontics with customized versus noncustomized appliances: a randomized controlled clinical trial', *Journal of Dental Research*, 96 (2017), pp. 1498-1504.

¹⁶ Robert H.J. Peerlings, Anne M. Kuijpers-Jagtman, Jan B. Hoeksma, 'A photographic scale to measure facial aesthetics', *European Journal of Orthodontics*, 17 (1995), pp. 101-9; Robert H.J. Peerlings, 'Treatment of a horizontally impacted mandibular canine in a girl with a class II Division 1 malocclusion', *American Journal of Orthodontics and Dentofacial Orthopedics*, 137 (2010), pp. S154-62.

¹⁷ Peerlings, op. cit. (n. 7).

unanswered. Several subjects and points of view are still controversial. These include the fonts, the paper, the watermarks, the timing of printing the text or parts of it, such as the title page, the first three leaves, and the register, the timing of engraving the copper plates and printing the maps, the engraver of the maps, the applied corrections to the text and maps during printing, the dedication, the number of different editions, and finally the relation between the two manuscripts and the printed edition of Berlinghieri's *Geographia*. Many scholars studied and described only one or some of these subjects, but not all. Others looked at different, sometimes overlapping, issues and details. This led to contradictory findings and statements. Some findings or opinions from authorities are frequently repeated and used to substantiate one's own theory or sometimes to subvert a deviating one. Up to now there is no comprehensive explanation for all the observations made by the experts involved in their studies of the *Geography*.

We conducted a short pilot study and superficially studied three copies in Florence.¹⁸ It was practical, as these atlases could regularly be found in the same libraries and institutions that we were already visiting for our articles about the Rome *Cosmography* editions. The provisional findings and results were promising. Two atlases contained coloured maps.¹⁹ We discovered the reason why others described the paper of the maps as heavier, thick, and solid. In these two copies, the paper used for the maps was backed with another sheet of paper. In some cases, the glue had let go, causing the two sheets of paper to separate. The paper of some maps was damaged or torn. This was easy to determine since the blank paper, with which the coloured map was backed, became visible. The presence of different watermarks in the paper used for the backing and the maps formed additional proof. To conclude, the watermarks detected differed from those that were described in the literature. The third atlas gave a totally different impression.²⁰ It was the only one with the additional title printed in red and the leaf with the register and colophon. The impressions of the maps were dense black. Furthermore, the watermarks found in the paper of these maps were completely different compared to those in the other two copies.

Another aspect of the pilot study concerned the comparison of the maps in two available facsimile atlases.²¹ This also led to new and promising findings, which needed to be further examined. Therefore, we decided to enter a new research project regarding Berlinghieri's *Geography*. The institutes and libraries with copies of Berlinghieri's *Geography* in their collection were found by using the Incunabula Short Title Catalogue of the British Library and the Gesamtkatalog der Wiegendrucke of the Staatsbibliothek zu Berlin. About 108 copies of the *Geography* in 89 institutes have been preserved.²² We have studied around forty printed copies in various libraries in Italy, England, Belgium and the Netherlands. Furthermore, a few copies with high resolution images were found and studied on the internet.²³ Although for obvious reasons the watermarks could not be studied, occasionally the combination of high-resolution images and the prominent presence of some watermarks in the paper made it possible to identify some of them in the atlases found on the internet. Lastly, some requested images were received from two copies in Chicago in the United States of America.²⁴ The two manuscript versions of Berlinghieri's *Geographia* have been studied personally in Milan and the Vatican City.

One of the problems studying these atlases is the fact that they are over 500 years old. We observed and studied them in their present state. But how did they become like this? What have they been through during the centuries? Have they been adapted? Another question concerns how they were compiled after they were printed. So, we had to try to find the truth based on what is presented to us now. We had to learn to comprehend the current appearance, however misleading it may be. There simply is no other information. On the one hand the atlases are deceptive, but on the other hand they are

¹⁸ Biblioteca Nazionale Centrale di Firenze, shelfmark Magl. Inc. N_20; Biblioteca Nazionale Centrale di Firenze, shelfmark Palat D.7.1.5; Biblioteca Riccardiana, shelfmark Ed.R.624.

¹⁹ Magl. Inc. N_20; Ed.R.624.

²⁰ Palat D.7.1.5.

²¹ Skelton, op. cit. (n. 2), the maps depicted in Skelton's book are based on the maps from the following copy: London, The British Museum, shelfmark 163.b.1; Consiglio regionale del Piemonte, op. cit. (n. 6).

²² Op. cit. (n. 9). This number is based on the count of the atlases listed in the ISTC files in December 2021.

²³ Bibliothèque nationale de France, shelfmark C 2035 9; Biblioteca de Catalunya, shelfmark Inc. 47-Fol.; Historic Map Works, item number OL5386; Biblioteca dell'Accademia della Crusca, shelfmark Inc. 34:

<http://incunaboli.accademiadellacrusca.org/theke/schedaimmagine2.asp?es=o&radice=000189809>

²⁴ Newberry Library, shelfmark Ayer 6.P9 B5 1480a; Newberry Library, shelfmark Ayer 6.P9 B5 1480b.

the only way to find out the truth. From the 1507 and 1508 editions of the Rome *Cosmographia* we have already learned and described in our article that what is displayed on the cover and title page does not always correspond with the actual content. Despite this hindrance, we hope to unravel the secrets of the *Geography*. The research method was initially the same as for the various editions of the Rome *Cosmographia*. Regarding the text pages, we initially only assessed the watermarks present in its paper. The maps were studied in more detail. The watermarks present in the paper of the maps, as well as those found in the paper some maps were backed with, were recorded. The comparison of the maps in the two copies during the pilot study led to the discovery of state differences. Therefore, the maps in the different atlases studied were compared with this preliminary list with state differences, as well as with each other.

As we are both professionally fully occupied, the visits to the libraries were planned during holidays. Living in the Netherlands, we confined ourselves to locations in Europe. We recorded and photographed the atlases as much as possible. Lighting conditions were not always optimal, nor adjustable, as other people were studying in the same rooms too. It was not always allowed to make photographs. In that case we had to confine ourselves to observe, take notes, and record everything as much as possible. When necessary, photos could be ordered afterwards at the photographic office of the specific library. In case data were not recorded completely or had to be studied further after more knowledge was acquired, we had to return to study an atlas again. This method of working had the disadvantage that it took some time before we had collected all the data. On the other hand, the advantage was that our knowledge increased during our research project. We observed, developed hypotheses, checked, and rejected them, and started over again. This way, each trip offered opportunities to pay extra attention to specific or new issues and to test developed theories. We gradually learned to understand how Berlinghieri's *Geography* was created and produced. To give an example: at some point we realized, based on findings and new ideas, that we needed to further compare and investigate the text pages. From that moment on we photographed each text page extensively and studied these at home. This led to a breakthrough concerning the understanding of the creation and production method of the *Geography*. In five years, we have collected information from 46 extant atlases. We think that this large number allowed us to identify the most important issues about Berlinghieri's *Geography*. In summary, the research procedure involved comparing photographs of what was visible on the paper and in the paper, and to develop, test, and reject theories, until all observations and their interrelationship were understood and could be explained. This was preceded and combined with the study of the existing literature on the subject. The information provided in this book will provide an apt research tool also for the copies we did not research. The next step of our project was the study of other books printed by the Florentine printer Tedesco. To test the developed theories and conclusions and to determine the chronology, we compared their printing characteristics, the used paper, and the watermarks with those of the *Geography*. The final step concerned a comparison of the text and the maps of the two manuscripts with the printed version of the *Geography*.

We begin this book describing Ptolemy and the rediscovery of his work during the Renaissance, combined with some information about the manuscripts that resulted from it. Next, a summary of the atlases printed before 1500 is given. Then Berlinghieri's *Geography* will be presented. Subsequently, the findings of our research will be described step by step. We start with discussing the paper and the watermarks. This is followed by the findings about the text, the maps, and the atlases studied. The book concludes with what we have discovered about both manuscripts and the relationship between them and the printed version of Berlinghieri's *Geographia*.

CHAPTER 1

Introduction to Ptolemy's Geographia

Ptolemy and the *Geographia*

Geographical knowledge in Europe changed dramatically from the middle of the fourteenth century until the end of the fifteenth century. New information became available about before unknown areas. More importantly, ancient geographical texts of Strabo (ca. 64 BC-20 AD), Pomponius Mela (ca. 43 AD), and the astronomer and mathematician Claudius Ptolemy (ca. 100-160 AD) were rediscovered.¹ The last one mentioned lived in Alexandria, at the time a place where seafarers and trading caravans from all parts of the known world met. That provided him with the opportunity to gather knowledge from distant regions and seas.² The versatile Ptolemy was not only concerned with astronomy, but also with acoustics, music theory, optics, and descriptive geography. He wrote a mathematical and astronomical treatise on the apparent motions of the stars and planetary paths, the *Almagest*. In this publication, Ptolemy mentioned that he would write a work about geography, which resulted in the book now known as the *Geographia*.³ He conceived that the primary function of geography was “mapmaking”, and that, to him, geography was synonymous with cartography. The task of the cartographer is to survey the world to scale.⁴ The rediscovery of the *Geographia* around 1400 led to the production of maps on a systematic and scientific basis in Europe. Portolan maps, quite accurate maps of coastlines, already existed more than a century before Ptolemy's maps were reintroduced. The contours of the land masses on portolan maps, especially of the Mediterranean, were much more accurate and truthful. However, the inlands were hardly or not shown at all on these maps. Further, they were not based on a scientific system suitable for further development and reproduction. Other maps from the Middle Ages, such as mappae mundi, were more metaphorical and theological presentations of the world.⁵

The *Geographia* was written in the second century. It describes a method to achieve an ordered cartographic representation of the world in scale. This can be accomplished by dividing the earth into latitudes and longitudes and determine the circumference of the earth. Combined with a mathematical method to visualize the earth on a flat surface and the presentation of coordinates of places on earth, maps could be made. Latin scholars in those days already knew the principles of geometric-astronomical geography but did not have a method to determine the geographical coordinates of places on earth.⁶ The text of the *Geographia* is divided into eight books, called *libers*. The first is devoted primarily to theoretical principles, including a discussion of globe construction, the description of two map projections onto a plane surface, and an extended, though amicable, criticism of his primary source, Marinus of Tyre (ca. 70-130 AD). Marinus had laid out a grid of straight lines equidistant from one another for both his parallels of latitude and meridians of longitude.⁷ Ptolemy described the dimensions of the world and introduced a conical projection method. This is a method for depicting the spherical surface of the earth on a flat surface. The following six *libers* are long lists of places with their respective coordinates.⁸ Ptolemy began with the western parts of the inhabited world, Europe first, then Africa, and lastly Asia. The coordinates were expressed in degrees of longitude east of the meridian drawn through

¹ Adolf E. Nordenskiöld, *Facsimile atlas to the early history of cartography with reproductions of the most important maps printed in the xv and xvi centuries* (New York 1973), pp. 6, 36.

² Jim Siebold: <https://www.myoldmaps.com/maps-from-antiquity-6200-bc/116-pomponius/119-ptolemy/>, p. 1.

³ Nordenskiöld, op. cit. (n. 1), p. 1; Consiglio regionale del Piemonte, Biblioteca Nazionale Universitaria di Torino, Centro Studi Piemontesi, Fondazione CRT, *Berlinghieri Geografia* (Torino 2006), p. 16.

⁴ Siebold, op. cit. (n. 2), p. 2.

⁵ Sean Roberts, *Cartography between cultures: Francesco Berlinghieri's Geographia of 1482* (Michigan 2006), p. 65.

⁶ J. Lennart Berggren, Alexander Jones, *Ptolemy's Geography* (Princeton and Woodstock 2000), pp. 3-53.

⁷ Op. cit. (n. 2), p. 4.

⁸ Consiglio regionale del Piemonte, op. cit. (n. 3), p. 16.

the Fortunate Isles, the prime meridian, and in degrees of latitude, north or south of the equator.⁹ In Ptolemy's time, the latitude, or distance from the equator, was generally astronomically calculated from the length of the longest and the shortest day. The earth was accordingly divided into a number of zones, parallel to the equator within which the days had a certain length. These zones were called *climates* from the Greek word meaning inclination. The numbers of the *climata* or parallels on the right of the maps give the number of hours in the longest day at different latitudes. They had a geographical, not a meteorological, significance although the climate of a region was somewhat related to its distance from the equator. The lines that separate the *climata* were termed parallels.¹⁰ Ptolemy puts the longitude first since he expected the mapmaker to draw the map from left to right. He planned twenty-six regional maps: ten for Europe, four for Africa, and twelve for Asia. The tables with coordinates, also called gazetteer, were meant to be used for both regional and world maps. The coordinates Ptolemy provided are largely inaccurate and suggest he did not verify either his own observations, or those made by others.¹¹ The fifth chapter of *Liber Septimus* contains a description of the map of the world, together with an enumeration of the oceans and of the more important bays and islands.¹² The final *liber* complements what has been described in the previous *libers*. It further mentions the length of the longest day for some important places and provides a table with 94 provinces, in which the world was divided.¹³

It is difficult to imagine that the *Geographia* originally did not contain maps. Ptolemy described, for example, how common faults by map makers could be avoided.¹⁴ It was assumed that they were lost. There are indications that Ptolemy's work and maps existed and were known in Europe and Arabia during the Middle Ages. A book from the sixth century contains text by Cassiodorus which refers to a manuscript of Ptolemy including maps. Leads in Arabic from the ninth and tenth century also exist. However, there is no general agreement as to whether the *Geographia* contained maps.¹⁵

Cartographers from the era of Ptolemy were confronted by three major cartographic problems. Ptolemy discusses these in the *Geographia*, based on the work of Marinus of Tyre, as the most recent of contemporary cartographers. The first problem concerned the size and position of the inhabited world. According to Ptolemy, Marinus of Tyre made some astronomical observations. He also used records of travelers and merchants. The number of days necessary to go by land or sea from one place to another were converted into *stades* (one mile is nine to ten *stades*). When the number of *stades* seemed excessive, it was reduced to suit his conceptions.¹⁶ Thus, direct earthly measurements as well as astronomical observations were used to determine the size of the earth. Ptolemy concluded that the most reliable way of determining distances was by astronomical observation.¹⁷ He used the measurement of Posidonius (ca. 135-51 BC) of about 18000 miles as a measure for the circumference of the earth, which was incorrect. It led to a smaller picture of the world. Eratosthenes' (ca. 276-194 BC) calculation for the circumference of the earth of 25000 to 28000 miles was much closer to the truth. Ptolemy has further reduced the longitudes, calculated by Marinus of Tyre, by 45 degrees. This was based on astronomical observations and led to a distorted image of the earth from east to west.¹⁸ The second cartographic problem was about map projections. Marinus of Tyre's goal, as well as Ptolemy's, was to visualize the world. Like Eratosthenes and Strabo, Marinus developed a rectangular projection in which the parallels and meridians were all drawn as straight parallel lines, the meridians perpendicular to the parallels.¹⁹ Ptolemy chose the equidistant conical projection as method to visualize the earth on a flat surface. He wanted to take into account the convergence of the meridians.²⁰ The third problem in Marinus' maps concerned the errors accumulated in the compilation of geographical detail from written commentaries

⁹ Oswald A.W. Dilke, 'Chapter 11 The culmination of Greek cartography in Ptolemy', *The History of Cartography Volume one* (Chicago 1987), pp. 184, 190.

¹⁰ Op. cit. (n. 2), p. 9.

¹¹ Dilke, op. cit. (n. 9), p. 190.

¹² Op. cit. (n. 2), p. 6.

¹³ Consiglio regionale del Piemonte, op. cit. (n. 3), p. 16.

¹⁴ Op. cit. (n. 2), p. 6.

¹⁵ Op. cit. (n. 9), p. 178.

¹⁶ Ibid, p. 179.

¹⁷ Op. cit. (n. 2), p. 6.

¹⁸ Berggren, op. cit. (n. 6), p. 29.

¹⁹ Op. cit. (n. 9), p. 179.

²⁰ Consiglio regionale del Piemonte, op. cit. (n. 3), p. 17.

concerning the coordinates of places. For example, Marinus sometimes corrected the latitudes of a place in one work and the longitudes of the same place in another work. Consequently, Ptolemy regarded the drawing of a map according to Marinus' data a hopeless undertaking.²¹ Dalché states that the coordinates described by Ptolemy were not all based on scientific observations either.²² Based on his own words, Ptolemy himself seems to have been fully aware of deficiencies with regard to the degrees of latitude and longitude of his coordinates.²³

In the *Geographia*, Ptolemy explained how to draw the map of the inhabited world on a globe and on a plane surface. He focused primarily on the techniques by which maps were compiled rather than solely on geographical content. Instructions, as to how maps of various types should be drawn, were included. His cartographic knowledge was transmitted in digital, by coordinates, longitudes, latitudes, and projection methods, rather than graphic form. Ptolemy's successors had to recreate the images he so clearly envisioned as the final product of the mapping process.²⁴ This explains the many differences found between maps from different copyists and artists. It can also be noted that both Ptolemy and the copyists of the fifteenth century were living in the Mediterranean. They were familiar with the shape and contours of these areas by the portolan maps, among other things. Territories further away were more unknown. The perimeters of these regions were partly based on travel information. For example, distances were determined by the number of days of travel on foot, by horse or by boat. The results depended on the conditions of the terrain, wind direction, and speed. Therefore, they were less accurate. Together with the already mentioned distortion caused by applying incorrect values of, for example, the earth's circumference, these are additional reasons for the less realistic representation of these regions on Ptolemaic maps.

The *Geographia* was, by its structured approach, from the beginning amenable for adjustments and corrections. This may explain the long-term popularity and history of the work. Geographers of the fifteenth and sixteenth centuries relied on it so heavily, while ignoring the new discoveries of maritime explorers, that it actually exerted a powerful retarding influence on the progress of cartography.²⁵ Nevertheless, the method was developed further in the fifteenth and sixteenth centuries and was made applicable to new areas, not yet known at the time of Ptolemy. An example is the map depicting Northern Europe, especially Scandinavia with modern content and a Ptolemaic structure. It was drawn in 1424 based on information from a Danish priest, Claudius Clavus, by order of Cardinal Orsini.²⁶ Ptolemy's maps were still in use at the time of Copernicus. The last edition, with copies after Ptolemy's maps by Mercator, was published by Wetstein, in 1730 in Amsterdam.²⁷

The rediscovery of the *Geographia*

The *Geographia* appears to have been unavailable to Western Europe until the beginning of the fifteenth century. Although no original manuscript of Ptolemy's text survived, several manuscript copies were preserved in the Byzantine Empire. One of them was brought to Italy together with other manuscripts in Greek by the Byzantine diplomat and scientist Manuel Chrysoloras (ca. 1355-1415, Fig. 1, see Annotated list of photographs and illustrations).²⁸ He compiled a Greek grammar in Florence for his students. They translated Ptolemy's *Geographia* and the works of Plato among many others. This made the astronomical mathematical grid of Ptolemy available again for the western world. During the renaissance, the Greek title *Geographia* was changed to the Latin *Cosmographia*. Another motivation for this adaptation of the title may be that cosmography is the basis of geography.²⁹ The Greek

²¹ Op. cit. (n. 9), p. 180.

²² Patrick G. Dalché, 'Chapter 9 The reception of Ptolemy's *Geography*', *The History of Cartography Volume three* (Chicago 2007), pp. 291, 308-09, 316.

²³ Op. cit. (n. 9), p. 183.

²⁴ Ibid, p. 180.

²⁵ Op. cit. (n. 2), p. 13; Dalché, op. cit. (n. 22), p. 327.

²⁶ Consiglio regionale del Piemonte, op. cit. (n. 3), p. 20.

²⁷ Henry N. Stevens, *Ptolemy's Geography* (Amsterdam 1972), p. 62.

²⁸ Op. cit. (n. 1), p. 9; Op. cit. (n. 22), p. 287.

²⁹ Op. cit. (n. 22), p. 292.



Fig. 1

manuscript, brought to Italy by Chrysoloras from Constantinople at the end of the fourteenth century has been preserved in the Vatican City.³⁰ The codex is drawn up by the Patriarch of Alexandria, Athanasius the Younger, for Emperor Andronicus II Palaeologus (1282-1328), between the last quarter of the thirteenth century and the beginning of the fourteenth century. It is believed to have been brought to Italy by the interference of Palla Strozzi, a Florentine banker, politician, writer, and philosopher. It was passed on to his son Nofri by testamentary provisions.³¹ Later, it became part of the collection of manuscripts from the library of Federico da Montefeltro, the Duke of Urbino. This can be concluded from an inventory list from 1482.³² The Byzantine scholar Chrysoloras chose the *Geographia*, from the many Greek texts brought by him, to start his Greek class. It was the first in Italy and the only one in Florence. The translation into Latin by Jacopo Angelo was finished around 1406. He only translated the text of the *Geographia*. It took some time before maps were also made with the place names in Latin instead of Greek.³³ Subsequent to this translation, the fifteenth century saw a spread of manuscripts and printed editions of the *Cosmographia*.

Further development of the *Geographia*

From the *Geographia*, two types of manuscripts with maps were produced. Type A contains 27 maps: a world map, ten maps of Europe, four of Africa and twelve of Asia. Type B contains 63 regional maps along with a world map. To some type B manuscripts four more maps were added, namely of Europe, Africa, and North and South Asia. The first printed copies of the *Geographia* are according to type A. One of the first surviving manuscripts is now present in Nancy.³⁴ It was owned by a French cleric, Cardinal Filastre. It dates back to the first decades of the fifteenth century.³⁵ Many manuscripts, it is estimated more than half, do not contain maps. Drawing them took a lot of time and was very expensive. Around 1420 it was still difficult in Italy to get hold of a copy with maps.³⁶ Regularly, the toponyms present on the maps differ from those in the gazetteers. Maybe this is caused by the fact that the text was translated first and the toponyms in Greek on the maps some years later. According to Dilke, the toponymic details in the gazetteers are more reliable, but there are exceptions. In such case, the scribe possibly had another or a different manuscript as an example.³⁷ That explains the differences found and extensively described by, among others, Almagià and Fischer in their search for the master copy.³⁸ Another explanation might be that toponyms were not copied from an ancient manuscript. They may have been inserted in maps by artists from another source or from a copy, other than the one used by the scribe. In addition, Dilke writes that Ptolemy does not seem to have known Latin well. This is based on

³⁰ The Greek manuscript from Chrysoloras, Urbinas Graecus 82, is present in the Vatican Library and can be consulted digitally: https://digi.vatlib.it/view/MSS_Urb.gr.82

³¹ Eleonora Azzini, 'Domizio Calderini e la recognitio tabularum Ptolemaei', *Tesi di Dottorato in Archivistica, Bibliografia e Biblioteconomia Università degli studi di Firenze*, M-STO/08 (2010), p. 14.

³² Biblioteca Apostolica Vaticana, Codices Urbinae Graeci Bibliothecae Vaticanae descripti, praeside Alfonso cardinali Capeceaturo, recensuit Cosimus Stornajolo, accedit index vetus Bibliothecae Urbinae nunc primum editus, Romae, Ex typographeo Vaticano, 1895, pp. 128-129; As cited in Azzini, op. cit. (n. 31), p. 14; Dalché described he has some doubts about this assignment, op. cit. (n. 220), p. 288.

³³ Op. cit. (n. 22), p. 292.

³⁴ Bibliothèque Renaissance à Nancy, shelfmark ms. 354. This type A atlas can be viewed page by page on the following website: <http://bmn-rennaissance.nancy.fr/items/show/1236>

³⁵ Op. cit. (n. 3), p. 20.

³⁶ Op. cit. (n. 22), p. 301.

³⁷ Op. cit. (n. 9), p. 191.

³⁸ Roberto Almagià, 'Osservazioni sull'opera geografica di Francesco Berlinghieri', *Archivio della R. deputazione romana di storia patria*, 68 (1945), pp. 211-55; Joseph S.J. Fischer, *Claudii Ptolemaei Geographicae Codex Urbinae Graecus 82* (Leiden 1932), pp. 375-98.

his mistakes regarding some toponyms.³⁹ Thus, there are a number of very simple, practical, and logical explanations for the differences regarding toponyms and their spelling. The application of coordinates was developed first in celestial cartography and later adapted for terrestrial use. Dilke states that the precision of Ptolemy's coordinates of places, estuaries and promontories was largely illusory since few scientific measurements of longitude and latitude had been made. Most of the figures were based on estimates of land or sea distances derived from sources of varying reliability.⁴⁰ Dalché describes that from copy to copy the figures given for specific coordinates vary.⁴¹ Despite these shortcomings, Ptolemy's texts were the carriers of the idea of celestial and terrestrial mapping long after the factual content of the coordinates had been made obsolete through new discoveries and exploration.⁴²

It would be wrong to overemphasize Ptolemy's "errors" as the cartographic literature has tended to do.⁴³ Dilke considers the inconsistencies and errors found between manuscripts based on the same origin inherent to the transmission process. Such differences between manuscripts developed during the fifteenth century. This suggests that in the much longer period between the death of Ptolemy and late Byzantine times even greater variations and inconsistencies may have arisen.⁴⁴ According to Dalché, in the first half of the fifteenth century, the *Geographia* was seen as a compendium of ancient place names.⁴⁵ This may explain why many editions and copies appeared without maps. Another probable reason is that drawing maps was time consuming and very expensive. The astronomical and geometrical methods Ptolemy offered were appreciated only insofar as they guaranteed the truth and exactitude of the representation. It seems that there was no great interest in his methods in Italy in those days.⁴⁶

From the second half of the fifteenth century onwards, the writing activity related to the Ptolemaic text increased considerably, caused by a growing demand. It is evidenced by the surprising concentration of manuscripts that can be attributed to this period, especially from the large Florentine "ateliers" working on illustrious assignments.⁴⁷ Massaio, Bartolomeo, Ghirlandaio, and Attavante were artists involved with the illumination and painting of these manuscripts.⁴⁸ They primarily were symbols of power and prestige, a demonstration of a prince's aesthetic taste rather than an instrument of study. Each could await a purchaser on the shelf of a bookseller. This explains why some parts might predate others by as much as ten years, why the decoration of an unsold manuscript might be left unfinished, and why the space for the owner's coat of arms was sometimes left blank.⁴⁹ Vespasiano da Bisticci was a known bookseller selling them.⁵⁰

Projection methods

As already described, there has been some discussion as to whether or not maps were attached to the *Geographia* from the beginning. The opinion that Ptolemy or a contemporary scholar probably did make at least some of the maps, so clearly specified in his texts, is increasingly accepted according to Dilke.⁵¹ It is common to draw the map of the inhabited world on a plane surface. Ptolemy examined different types of map projection and their ability to maintain the characteristics of a sphere. The *Geographia* contains a detailed description of four systems of map projection: the Marinus projection with straight and perpendicular parallels and meridians (Fig. 2); Ptolemy's first projection with straight

³⁹ Op. cit. (n. 9), p. 191.

⁴⁰ Oswald A.W. Dilke, 'Chapter 16 Cartography in the ancient world: a conclusion' *The History of Cartography Volume one* (Chicago 1987), p. 276.

⁴¹ Op. cit. (n. 22), p. 359.

⁴² Dilke, op. cit. (n. 40), p. 278.

⁴³ Ibid, p. 278.

⁴⁴ Oswald A.W. Dilke, 'Chapter 15 Cartography in the Byzantine empire', *The History of Cartography Volume one* (Chicago 1987), p. 271.

⁴⁵ Op. cit. (n. 22), p. 359.

⁴⁶ Ibid, p. 359.

⁴⁷ Op. cit. (n. 31), p. 10.

⁴⁸ Claudius Ptolemaeus, *Francesco Berlinghieri Geographia Florence 1482*, with an introduction by Raleigh A. Skelton (Amsterdam 1966), p. XII; Raphaele Tauci, 'La geografia del Berlinghieri della Biblioteca Alessandrina di Roma', *La Bibliofilia*, 69, (1967), p. 71; Op. cit. (n. 31), p. 11, 126.

⁴⁹ Op. cit. (n. 22), p. 324.

⁵⁰ Op. cit. (n. 3), p. 19, 20.

⁵¹ Op. cit. (n. 40), p. 278.

converging meridians and curved parallels (Fig. 3); Ptolemy's second projection with curved converging meridians and curved parallels (Fig. 4-5); and Ptolemy's third and special projection of the globe as viewed from a distance (Fig. 6-7).⁵² Ptolemy rejected Marinus' projection for the world map because it resulted in a severe deformation away from the central parallel. According to Ptolemy, the Marinus projection could be applied for the regional maps as they covered a smaller area.⁵³ The regional maps in Greek codices and early Latin translations were drawn according to this rectangular projection, employed by Marinus and described by Ptolemy. The problem with the world map was solved by Ptolemy's first projection. However, this projection method also had its shortcomings. It did not reflect the spherical shape of the earth as effectively. Further, only two parallels maintained their true lengths. Nevertheless,

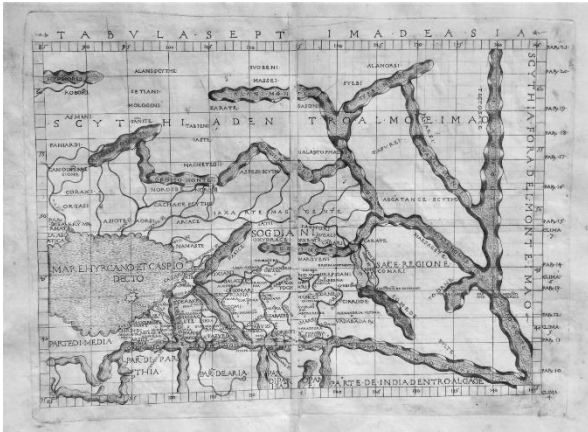


Fig. 2

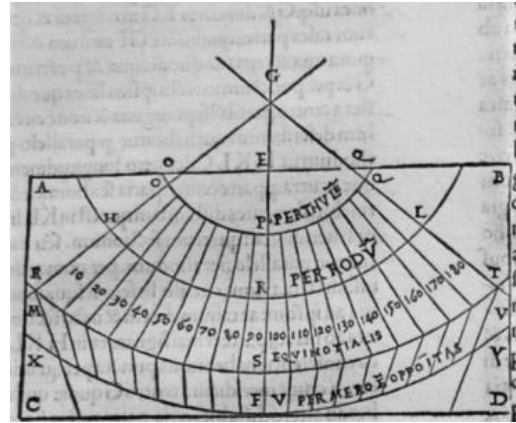


Fig. 3

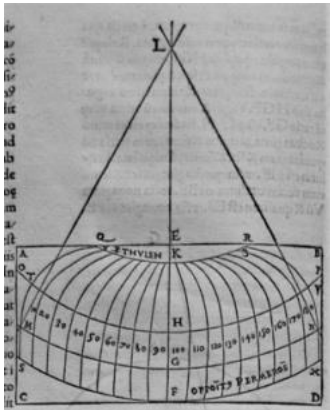


Fig. 4

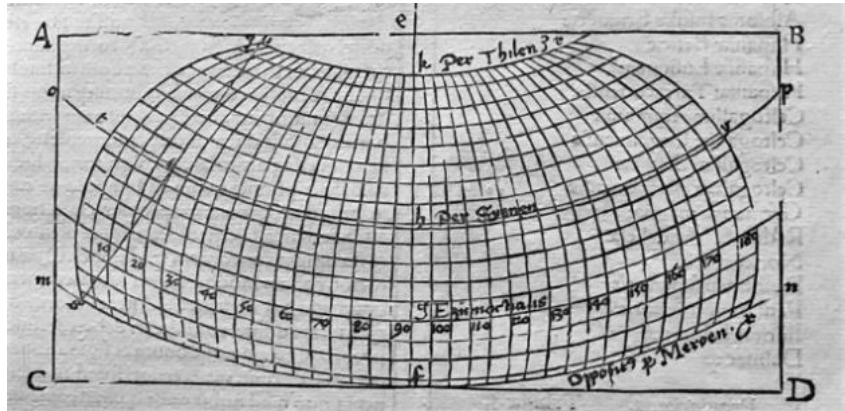


Fig. 5

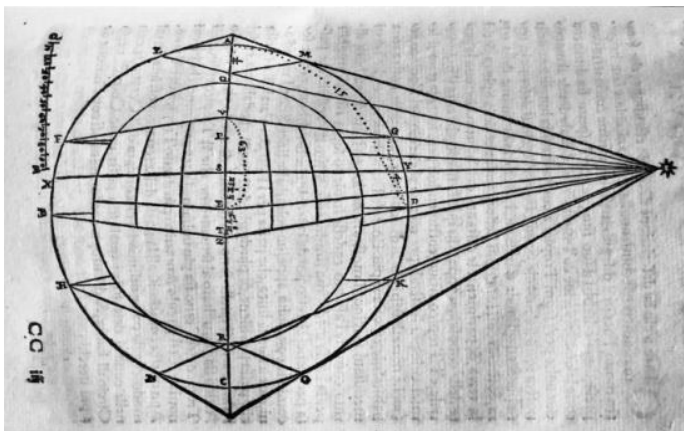


Fig. 6

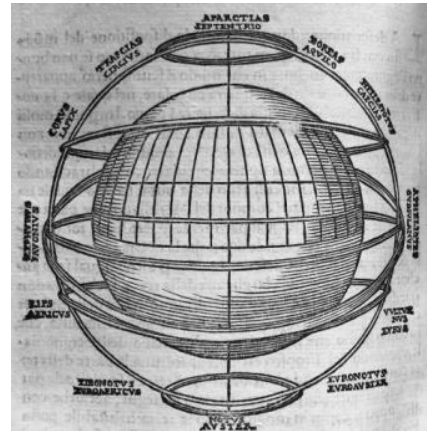


Fig. 7

⁵² Op. cit. (n. 9), pp. 185-89.

⁵³ Ibid, p. 185.

early scholars attempting to draw a world map from Ptolemy's instructions seem to have preferred the first projection because it was easier to implement.⁵⁴ To alleviate these problems Ptolemy developed his second projection. Its aim was to give the lines that represent the meridians the appearance they have on the sphere, when viewed by an observer looking directly at the center of the map. This second projection, although it was more difficult to apply, was popular with later editors of the *Geographia* in the Renaissance.⁵⁵ Ptolemy's third projection arose from his description of the armillary sphere. The aim was to give a plane representation of the terrestrial globe in such a way that all the inhabited world could be seen unencumbered by the rings of the armillary sphere.⁵⁶

Germanus' projection methods

Initially, Ptolemy's projection methods were used to develop maps. Dalché described it was difficult to understand the theoretical explanations in the text due to the poor quality of Jacopo Angelo's translation. According to Regiomontanus, Jacopo Angelo neither knew Greek nor mathematics. The schema for cartographic construction in books one and two of the *Geographia* were full of mistakes and discrepancies with the text. In addition, maps did not get the appearance intended by Ptolemy because of Jacopo's mistakes regarding the meaning of Ptolemy's words.⁵⁷ Later, scholars tried to adapt and improve the projection methods. Between 1460 and 1480, new projection methods for displaying maps on a flat surface were developed. These are regularly ascribed to Germanus. Little is known about him outside his works. He can be seen as a product of the scientific activity in the Benedictine houses of Southern Germany and Austria, following in a tradition handed on from Klosterneuburg to Reichenau and Tegernsee.⁵⁸ In March 1466, Germanus presented an illuminated copy of the *Cosmographia* to Borso d'Este, Duke of Ferrara. It contained only Ptolemaic maps. This is an example of his first revision of Ptolemy's work between about 1460 and 1466. The maps were redrawn on a trapezoid projection, the so called Donis-projection (Fig. 8-9). Germanus claims in his letters to be the originator of the trapezoid projection.⁵⁹ He also increased the number of modern place names and showed frontiers using dotted lines.⁶⁰ The contents and text of this manuscript have also been modernized. Information from nautical, portolan, and chorographic maps was added to the Ptolemaic basic view.⁶¹ Quite accurate maps of coastlines already existed for about 200 years. These so-called *portolani* were created empirically and practically by means of observation. The word portolan comes from the Italian *portulano*, which means related to ports or harbors. The marine cartography was much readier to accept new input and face questions about modes of representation compared to the Ptolemaic cartography. On the other hand, *portolani* were not created by a systematic method. Above all, they contained little or no information about the inlands.⁶² Thus, the Ptolemaic model has stimulated, but also hindered the development of cartography.⁶³ Between 1466 and 1468 Germanus prepared his second revision. He then redrew the world map on a homeotheric projection with curved meridians and parallels instead of the conical first projection with rectilinear meridians (Fig. 10).⁶⁴ Furthermore, he added modern maps of Spain, Italy, and the North.⁶⁵ In the third revision he added two more modern maps of France and Palestine. A manuscript with these characteristics is assumed to have been drawn or completed after 1474.⁶⁶ Dalché does not value the accomplishments of Germanus very highly. He states the maps have been changed

⁵⁴ Ibid, pp. 187-88.

⁵⁵ Ibid, p. 187.

⁵⁶ Ibid, p. 188.

⁵⁷ Op. cit. (n. 22), p. 340.

⁵⁸ Claudius Ptolemaeus, *Cosmographia Ulm 1482*, with an introduction by Raleigh A. Skelton (Amsterdam 1963), p. VI.

⁵⁹ Skelton, op. cit. (n. 58), p. V.

⁶⁰ Op. cit. (n. 22), p. 320.

⁶¹ Op. cit. (n. 3), pp. 20-1, 30, 34-5.

⁶² Roberts, op. cit. (n. 5), p. 31.

⁶³ Op. cit. (n. 22), p. 327.

⁶⁴ Op. cit. (n. 9), p. 186.

⁶⁵ Op. cit. (n. 58), p. V.

⁶⁶ Ibid, p. V.

arbitrarily and non-mathematically by him. He adds that the maps varied from one manuscript to another because they were copied without reference to the text.⁶⁷



Fig. 8

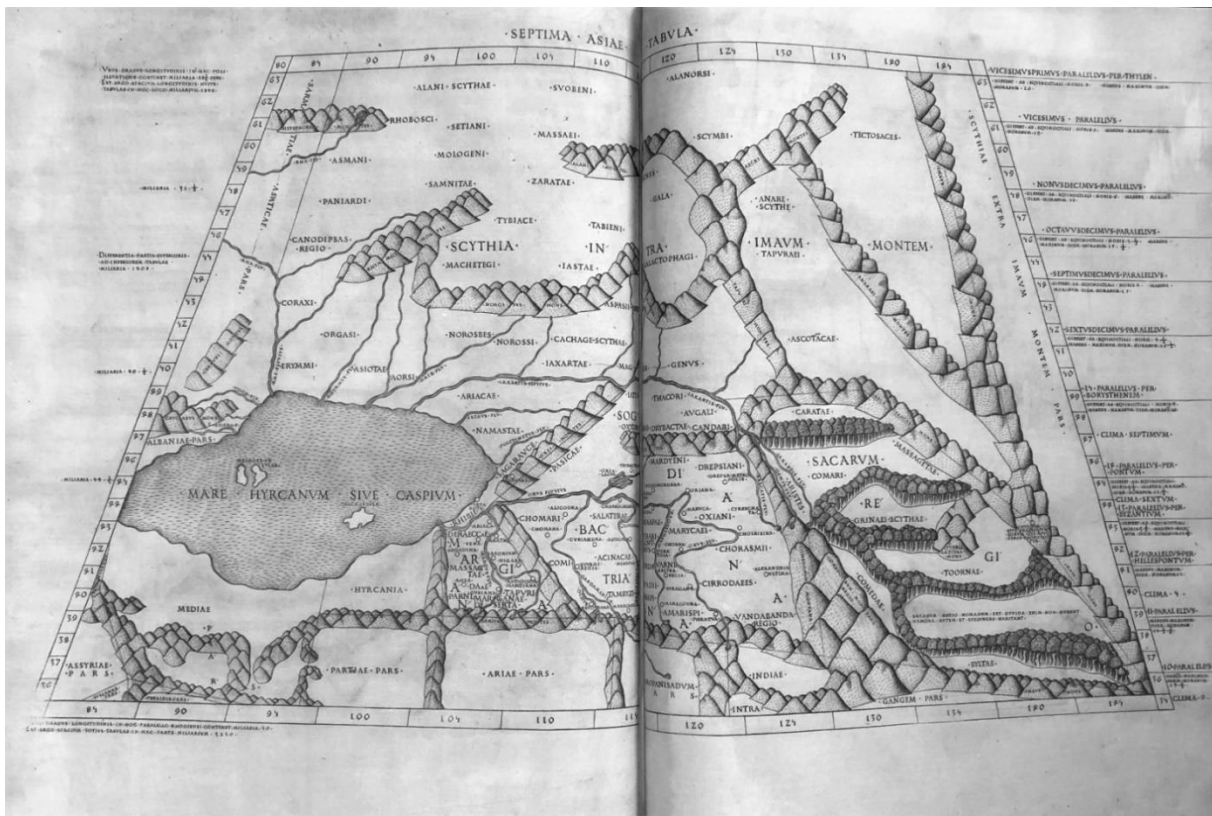


Fig. 9

⁶⁷ Op. cit. (n. 22), p. 340.



Fig. 10



Fig. 11

The modern maps

Possibly, Germanus was not the first to add modern maps. Three manuscripts were illuminated by Hugo de Comminelli di Mezières. They contain maps painted by the Florentine miniaturist and cartographer Pietro del Massaio.⁶⁸ The first manuscript is undated, but it should be placed before 1456. It comes from the library of the king of Aragon in Naples. It was sold together with tapestry in March 1456 to Alfonso of Aragon by Giovanni Artani, a Florentine merchant, for 100 ducats. Dalché claims it should not be dated before 1456 but rather between 1464/65 and 1480.⁶⁹ Durand suggested that the modern maps may have been added later.⁷⁰ The second manuscript bears the date 1469 and the third one 1472. All three contain several modern maps including one from Spain, one from France, and one from Italy. They are considerably identical in all three manuscripts. However, Dalché describes that there are differences in the techniques of representation used on them in these manuscripts.⁷¹ It appears that the painter switching models was common practice. Certain features were a matter of choice to be decided by the actual purchaser of the manuscript.⁷² Pietro del Massaio is only known as a mediocre painter. He was certainly not the author of the maps himself. He will have copied them for the three manuscripts from an existing model. The resemblance between these three and those in the printed version of Berlinghieri and the Braidense manuscript is striking. They perpetuate a thread that leads back to him. An improved version is present in Berlinghieri's printed edition of the *Geography*.⁷³ The modern maps in two other manuscripts can be positioned in between those of Pietro del Massaio and the ones present in the Braidense manuscript and Berlinghieri's printed version of the *Geography*.⁷⁴ The source of the modern maps, apart from the map of the North, appears unknown. They look like a composite of portolan maps, as far as the outline of the areas is concerned, and Ptolemaic maps for the inlands. Almagià regards them as the product of geographical activity of Florentine students. There is a marked similarity between the modern maps of Spain, France, and Italy by Massaio and Germanus. The designs for these *tabulae novellae*, in the editions published in Florence and Ulm in 1482, were derived from these maps (Fig. 10-11).⁷⁵ In codices of the second revision, the modern map of Spain is on the trapezoid projection.⁷⁶ In those of the third revision it is on the old plane projection from Marinus of Tyre.

From manuscripts to printed editions

The manuscripts containing maps, in many cases luxuriously illuminated and gilded, belonged to the largest and most precious books of the time. An atlas was in fact one of the essential acquisitions for a library that wanted to be complete from a scientific point of view. Therefore, many manuscripts from the first half of the fifteenth century from Florence were present in the major libraries and collections of high-ranking, rich, and powerful people, like Federico da Montefeltro of Urbino, Borso d'Este from Ferrara, the Sforza in Milan, the Popes Sixtus IV and Alexander VI, the Medici, Matthias Corvinus King of Hungary, and the kings of Naples.⁷⁷ During the last quarter of the fifteenth century, a few decades after the invention of printing in Europe, the first atlases were printed.

⁶⁸ The three manuscripts can be consulted digitally. Bibliothèque nationale de France, shelfmark Latin 4802: <https://archivesetmanuscrits.bnf.fr/ark:/12148/cc63677b>; Biblioteca Apostolica Vaticana, shelfmark Vat.lat.5699: https://digi.vatlib.it/view/MSS_Vat.lat.5699; Biblioteca Apostolica Vaticana, shelfmark Urb.lat.277: https://digi.vatlib.it/view/MSS_Urb.lat.277

⁶⁹ Op. cit. (n. 22), p. 321.

⁷⁰ Op. cit. (n. 58), p. VIII.

⁷¹ Op. cit. (n. 22), pp. 321-22.

⁷² Ibid, p. 322.

⁷³ Almagià, op. cit. (n. 38), p. 247.

⁷⁴ Bibliothèque nationale de France, shelfmark Lat.8834; Biblioteca Medicea Laurenziana, shelfmark Plut. XXXI, the manuscript can be consulted digitally: <http://mss.bmlonline.it/?&search=plut.30.1>

⁷⁵ Op. cit. (n. 58), p. VIII.

⁷⁶ Roberto Almagià, 'The first modern map of Spain', *Imago Mundi*, 5 (1947), pp. 27-31.

⁷⁷ Op. cit. (n. 5), p. 19.

CHAPTER 2

Printed editions of the Cosmography prior to 1500

Introduction

The first printed atlases in Europe form part of the foundation of the Renaissance and humanism. They were revolutionary, as they changed the perception of the image of the world. Furthermore, they contributed to the development of printing, engraving, and bookmaking. The invention of printing resulted in a much faster and larger expansion of libraries than through manuscripts. The dissemination of knowledge to larger groups of people was greatly facilitated by printing. The first printed atlases coexisted with manuscripts and other printed books that were frequently coloured and illuminated. It is therefore not surprising that they were sometimes coloured and illuminated themselves. This way, these atlases were turned into a kind of manuscript again. They may be judged almost as important as paintings by artists of the time.¹ The printing of an atlas transcended the limits of technical ability. Painting and illuminating them created a hybrid culture of manuscripts and printed works. The different editions of the Rome *Cosmography* are a bit of an exception. They are only rarely found coloured. In contrast to the major technological innovation, little or no cartographic innovation can be found in these first printed maps. They were copied from different existing manuscript examples, with variations regarding the projection methods applied.

In this chapter we briefly describe all cosmography editions printed before 1500, in combination with the corresponding watermarks to the best of our knowledge. As it concerns the first printed atlases, their printers were pioneers. They all faced similar problems but chose different solutions and production methods. This also applies to Berlinghieri's *Geography*. By describing the characteristics of these contemporary produced atlases, it becomes easier to understand the technical details of the *Geography*. We would first like to provide some general knowledge about the production of maps during the Renaissance.

Engraving and printing maps during the Renaissance

According to Woodward, the requirements necessary for printing maps are the ease of making corrections, the ability of the medium to hold fine detail and the versatility in combining lettering and linework.² The two techniques applied, woodcut and copper engraving, related with respectively relief and intaglio printing, differed with respect to these requirements. For relief printing, the block of wood, mostly fruitwood, is cut so that the areas to be printed appear in relief and produce lines. The indentations can sometimes be felt on the back of the impressions. The advantages of the woodcut technique are that common typographic printing presses could be used, that the wood blocks could be printed together with type in the same form, and that the wood block allowed many impressions. The disadvantage of this technique compared to copper engraving is that carving does not allow fine detailing, it is black or white. Letters are difficult to carve in wood. Therefore, letterpress is often inserted in the wood block and printed together.³ With the intaglio technique, lines are engraved into a copper plate with a burin. Ink is rubbed into the engraved lines and printed under high pressure between two heavy cylinders. The resulting lines can be felt on the paper as tiny ridges. This technique can be further identified by the indentation of the copper plate in the paper at the margins of the plate, when they have not been trimmed off. With the intaglio technique finer lines and more shades of black and grey can be

¹ Sean Roberts, *Cartography between cultures: Francesco Berlinghieri's Geographia of 1482* (Michigan 2006), pp. 24-5, 105-06.

² David Woodward, 'Chapter 22 Techniques of map engraving, printing and coloring in the European Renaissance', *The History of Cartography Volume three* (Chicago 2007), p. 592.

³ Woodward, op. cit. (n. 2), p. 594.

produced.⁴ Another advantage of copper engraving is that corrections can be made by burnishing the copper plate, followed by a new engraving. Disadvantages are the high cost of copper and the softness of the material, which can easily lead to scratches. It is much more difficult to print images and texts together with the intaglio technique compared to relief printing.

Several techniques were available to transfer an image onto a copper plate. One could use a calque, which is tracing paper made transparent with oil with a layer of chalk or charcoal for tracing the image onto the copper plate. An alternative technique involved perforating a leaf of paper with a succession of closely spaced pinholes to define, for example, the outlines. A fine powder was then rubbed over the perforated leaf, leaving small deposits on the underlying copper plate.⁵ Once the main lines were in place, further details such as lettering, title cartouches, and longitude and latitude grids could be copied directly onto the plate by hand.

Before a copper plate could be printed, one had to make ink and dampen the paper so the ink would transfer better. Next, the copper plate was heated and inked. After printing, the copper plate had to be cleaned. By far the most time-intensive job was inking. It took about twenty minutes to prepare a plate of about two thousand square centimeters. This is about the size of most of the maps in the different editions of the *Cosmography* and *Geography*. Thus, about thirty prints, or approximately one atlas, could be printed in one day with the use of one press.⁶ While the printer was passing one plate through the press, another plate was being inked. The quality of the impressions is influenced by the quality of the copper plate, the applied pressure during the printing process, the inking of the copper plates, and the quality of the ink. After printing, the sheets were hung on a line to dry. Next, they were placed in a standing press to flatten the creases. Regularly, this kind of work was done by a minimally paid apprentice.⁷ After drying, the paper was further processed into a book by a bookbinder. The ink for wood block printing and intaglio printing was oil based. It was composed of linseed oil and mixed with a black medium, for example vine black, lamp black or burned apricot stones. The oil was boiled to thicken it.⁸

Engraving maps was different compared to engraving artistic prints, as they contained less detail and required other demands. The lettering of maps is a distinctive issue. The small lettering needed for place names on maps was difficult to achieve with the woodcut technique. On the other hand, the woodcut technique could easily be combined with metal type, as both are in relief. Copper plates were an easier medium to engrave place names. Nevertheless, this medium still required high skills from the engraver. An alternative to engraving letters on copper plates were the use of letter punches. The letters were hammered into the copper plate with the help of these punches. If applied properly, as with the different Rome editions of the *Cosmography*, it led to a very homogeneous and neat image.⁹ Both techniques have advantages and disadvantages. Therefore, it is not surprising that initially both techniques were applied to produce maps and atlases. It is more astonishing that in the last quarter of the fifteenth century the woodcut technique was prevailing in Northern Europe, while the copper engraving technique was applied in Italy to produce the earliest printed Ptolemaic atlases.

The 1475 Vicenza *Cosmography* edition

The first printed cosmography ever did not appear in Germany, where the art of printing was invented, but in 1475 in Vicenza, Italy. It did not contain maps. The paper for this edition may have been supplied by the paper manufacturer Michele Manzolo.¹⁰ We studied a copy in person in Göttingen. The watermark predominantly found in the paper of this edition was a bird. The other watermarks were a

⁴ Ibid, pp. 592-96.

⁵ Ibid, pp. 594-95; Tony Campbell, 'Chapter 19 Portolan charts from the late thirteenth century to 1500', *The History of Cartography Volume one* (Chicago 1987), p. 391.

⁶ Op. cit. (n. 2), p. 597.

⁷ Ibid, p. 597.

⁸ Frans Laurentius, *Clement de Jonghe (ca. 1624-1677) Kunstverkoper in de Gouden Eeuw* (Houten 2010), p. 69-70.

⁹ Op. cit. (n. 2), p. 601.

¹⁰ Eleonora Azzini, 'Domizio Calderini e la recognitio tabularum Ptolemaei', *Tesi di Dottorato in Archivistica, Bibliografia e Biblioteconomia Università degli studi di Firenze*, M-STO/08 (2010), p. 52.

five-leaf flower and a simple form of a mountain with three peaks (Fig. 12-14).¹¹ An overview of the references found in databases related to the watermarks in this chapter is given in attachment one.

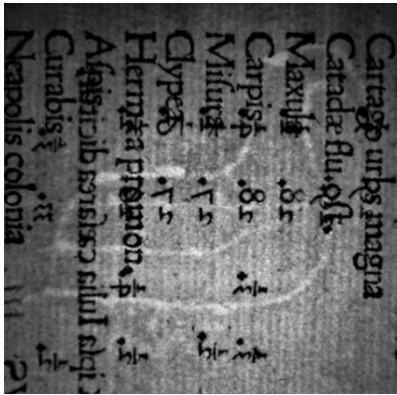


Fig. 12

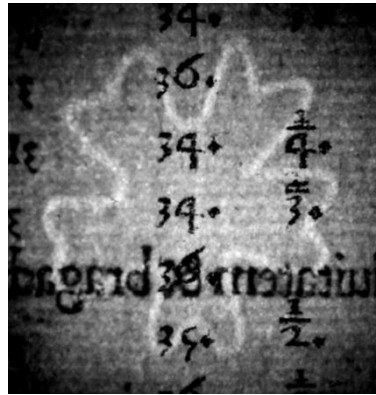


Fig. 13

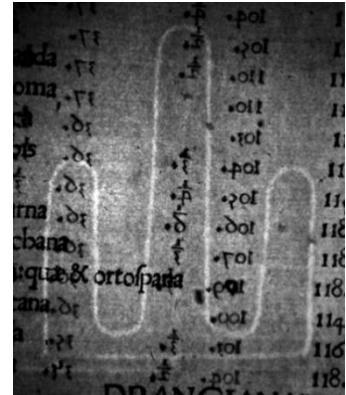


Fig. 14

The 1477 Bologna *Cosmography* edition

The first printed atlas with maps was published in Bologna, in 1477 by Domenico de Lapi. It contains maps engraved in copper plates. This edition shows many errors.¹² The date mentioned in the colophon is June 23, 1462.¹³ There are sources that allow us to reconstruct the genesis of the Bolognese edition of the *Cosmography* in more detail. This information was published by Albano Sorbelli. The first source is a notarial deed dated September 8, 1474.¹⁴ On that occasion, the Milanese Filippo di Giovanni Bentivoglio di Giacomo di Balduini, chancellor of the lord of Bologna, Giovanni di Baldassarre degli Accursi of Reggio, Taddeo Niccolò Crivelli, a miniaturist from Ferrara, and Lodovico and Domenico De Ruggeri decided to set up a company to have Ptolemy's *Cosmography* printed. In order to produce the cartographic tables, De Lapi collaborated with prominent scholars of the time, as well as the famous miniaturist from Ferrara, Taddeo Crivelli. He was commissioned to make the engravings for the maps of the *Cosmography*. In Bologna, instead of the 27 maps according to the manuscript tradition, a complete edition of 26 plates engraved in copper was published for the first time. The world map is on a simple conic projection, the first of the two projections described in Ptolemy's text. The same projection, with parallels drawn as concentric arcs and with straight meridians, was empirically adapted to the regional maps.¹⁵ The world map is not numbered, the regional maps from one to twenty-six. Number fifteen is missing, and the numbers are transposed on two adjacent plates, the "Tabulae" sixteen and seventeen. Furthermore, the numbers were omitted from six maps as first issued and later added on three of them. Five maps have the serial number written out, for example Tabula Quinta.¹⁶ The poor technique of the engraving raises doubts as to whether the engravings can be attributed to Crivelli. They do not have the level of perfection, characteristic for his art as a miniature painter, to be distinguished in the Bible of Borso d'Este.¹⁷ Maybe the difference in technique accounts for this. Painting miniatures requires a different skill compared to engraving copper plates.

A second notarial deed, drawn up in April 1477, contains an agreement between Balduini, Ruggeri, and Baldassarre degli Accursi on the one hand and De Lapi on the other hand. De Lapi had to forward the cost of printing five hundred copies of the *Cosmography*. He would receive a compensation

¹¹ The watermark bird: Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 3, p. 611, no. 12130; The watermark five-leaf flower: Ibid., vol. 2, p. 366, no. 6365; The watermark simple form of a mountain with three peaks: Ibid., vol. 3, p. 590, no. 11659; WZMA AT8500-12449_1; WZMA AT8500-12449_2.

¹² Consiglio regionale del Piemonte, Biblioteca Nazionale Universitaria di Torino, Centro Studi Piemontesi, Fondazione CRT, *Berlinghieri Geografia* (Torino 2006), p. 21.

¹³ *Catalogue of books printed in the XVth century now in the British Museum*, Vol. 6, 814.

¹⁴ Azzini, op. cit. (n. 10), p. 62.

¹⁵ Claudius Ptolemaeus, *Cosmographia: Bologna 1477*, with an introduction by Raleigh A. Skelton (Amsterdam 1963), pp. V-VIII.

¹⁶ Skelton, op. cit. (n. 15), p. VII.

¹⁷ Op. cit. (n. 10), p. 63.

of 100 ducats in gold. This would have been paid from the sale of the first printed atlases. De Lapi could keep the remaining copies to sell them for one and a half ducats per volume. A clause was added, stating that if De Lapi was not fully satisfied within two months after the end of the printing process, the shareholders would jointly pay the full amount.

On January 25, 1478, a new contract was concluded between De Lapi and Giovanni degli Accursi providing for the dissolution of Giovanni degli Accursi's commitment with the company. The notarial deed of 1478 shows that the sale of the *Cosmography* did not proceed as expected. The low sales forced them to look for another way to pay the printer.¹⁸ The text pages of this edition were successively printed to the intended number without modifications. The maps were still being printed after the text was ready, in several print runs. This can be deduced from the different states in which the maps can be found. Thus, the copper plates were adjusted during the sale of the edition. Records have been found stating the delivery of one atlas on June 29, 1477, and another twenty-four on July 11, 1477. Only one map remained unchanged. The other maps were modified at least once. Six maps were modified twice. In October 1479 there were still unsold copies.¹⁹ The extant atlases are composed of maps in different states and with different combinations of states. Apparently, the maps were randomly compiled by the bookbinder. A copy with every map in the first state, with one exception, has been described. Later states were already found in early copies. Twenty of the twenty-six remaining copies of this edition are coloured.²⁰

We received tracings from watermarks found in a 1477 copy present in Munich.²¹ In the paper of the text pages the watermarks n in a circle, a simple form of a mountain with three peaks and a cross on top, and a lily with a crown on top were found. In the fly leaf a crown, and in the end leaf a five-leaf flower were present (Fig. 15-20). We do not know if the fly and end leaves are original paper, or that they have been replaced or added later. The maps were backed with a second sheet of paper. Therefore, no watermarks could be detected in the paper of the maps. In the backing of the first two maps the watermark grapes could be detected.²²

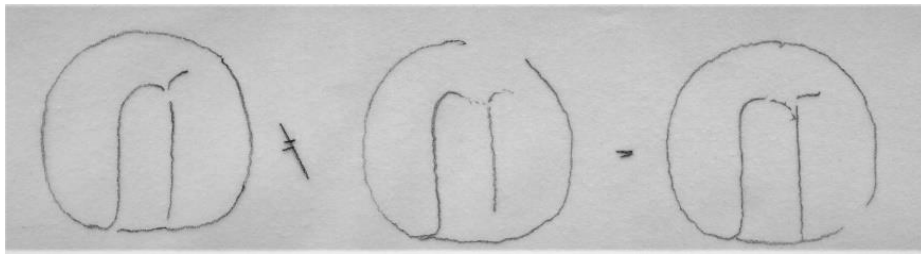


Fig. 15



Fig. 16



Fig. 17

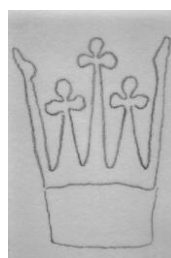


Fig. 18

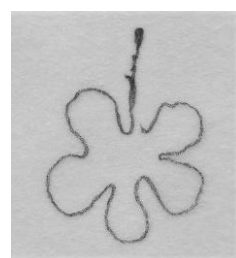


Fig. 19

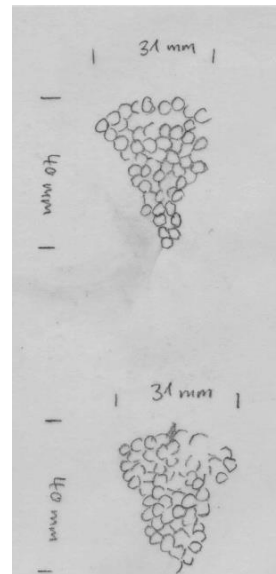


Fig. 20

¹⁸ Ibid, p. 64.

¹⁹ Op. cit. (n. 15), pp. VII-VIII.

²⁰ Ibid, p. VII.

²¹ Bayerische Staatsbibliothek München, shelfmark Rar. 124.

²² The watermark n in a circle: Wasserzeichen-Informationssystem, www.wasserzeichen-online.de Referenznummer DE5580-Rar124_a2; Ibid., Referenznummer DE5580-Rar124_A8; The watermark simple form of a mountain with three peaks and a cross on top: Ibid., Referenznummer IT7005-PO-150558; The watermark lily with a crown on top: Briquet, op. cit. (n. 11), vol. 2, p. 397, no. 7224; The watermark crown: Ibid., p. 292, no. 4790; Wasserzeichen-Informationssystem, www.wasserzeichen-online.de Referenznummer DE5580-2Incca2591_a1; The watermark five-leaf flower: Ibid., Referenznummer DE5580-2Incca1178a_XX; Briquet, op. cit. (n. 11), vol. 2, p. 369, no. 6463; The watermark grapes: Ibid., vol. 4, p. 650, no. 13049.

The 1478 Rome *Cosmography* edition

On October 10, 1478, the third printed edition of the *Cosmography* appeared in Rome.²³ The project was started by Arnold Pannartz and Conrad Sweynheym. Pannartz possibly was a native of Prague and Sweynheym a native of Eltville, near Mainz. They were educated as priests.²⁴ Sweynheym is supposed to have worked with Gutenberg. Pannartz and Sweynheym introduced Gutenberg's invention to Italy. In 1464 they established a printing company in a Benedictine monastery in Subiaco. There, the printing of books in Italy started. The printers shared the fate of their master, Gutenberg. They could not sell their books, fell into want and moved to Rome in 1467.²⁵ The first printed books by Sweynheym and Pannartz looked very much like manuscripts in layout and formatting, as well as in typeface that can best be described as semi-gothic. Once they settled in Rome, they carved a new typeface for which they produced stamps and dies of more authentic looking "old" letters, probably modeled after a humanist manuscript. The Roman goldsmith who made the moulds in 1467 reproduced the graceful letters that had emerged from Poggio Bracciolini's pioneering work and were used by notaries and scholars such as Ser Antonio di Mario, Gherardo del Ciriagio, and Pierro Strozzi. This gave the first printed works a manuscript appearance. The printers south of the Alps would soon come to prefer the ancient letters of the Florentine lovers of wisdom.²⁶ In 1472 they applied to Pope Sixtus IV for church benefices. Perhaps the pope also aided them financially. More works were printed in 1472 and 1473. After that they parted. Pannartz printed additional volumes himself. Sweynheym took up engraving on metal and executed the fine maps for the Rome *Cosmography*. Pannartz died in 1476, Sweynheym in 1477.²⁷

In the foreword to their cosmography edition, a preparation of three years by Sweynheym and the workgroup he founded, is mentioned. The text of the *Cosmographia* by Jacopo Angelo was subjected to an intensive revision for the Rome edition of 1478, by Domizio Calderini. He modified the text of Jacopo Angelo in many places, closer to the Greek original. Further, he meticulously corrected the values of the longitude and latitude degrees. Finally, he rectified toponyms and placed them in the correct order. He too died prematurely, in June 1478.²⁸ Their first edition of the Rome *Cosmography* was published with the colophon date October 10, 1478, by Arnold Buckinck.²⁹ Compared to the editions in Vicenza 1475 and Bologna 1477, the quality of the Rome 1478 edition is striking. Due to the death of Sweynheym in 1477, the publication was eventually completed by Arnold Buckinck. His name appears in the lists preserved in the rich collection of documents of the Archives of Santa Scolastica in Subiaco. In 1461 an "Arnoldus de Alemania" is mentioned among the monks. No trace of him has been found in the next list of 1475.³⁰ There are no indications of a possible return to the country of birth. This is the case for most of the other names on the list. Neither was there any indication of his death. Possibly, the Germans left the monastery in a period that probably corresponds to the move of Sweynheym and Pannartz from Subiaco to Rome. Unfortunately, the documents make no mention of the function of the Germans in the monastery. Therefore, further identification remains in the dark. Buckinck may have been one of the assistants in the workshop. Regardless of the gaps that remain in Buckinck's biography, there is reason to assume that his contribution to the publication of the *Cosmography* was secondary, at least until Sweynheym's death. This is primarily suggested by the fact that, in his inaugural letter written for the *Cosmography*, Domizio Calderini did not mention Buckinck's involvement in the publication.³¹

Sweynheym was specialized in metalworking. He was able to create matrices for the production of type. The text was arranged on two columns of fifty lines, is completely Roman and very elegant. The margins outside the page setting are wide. This feature has been preserved in most of the specimens. The

²³ Henry N. Stevens, *Ptolemy's Geography* (Amsterdam 1972), p. 38.

²⁴ Ross King, *The bookseller of Florence* (Amsterdam 2021), pp. 258, 260.

²⁵ Consiglio regionale del Piemonte, op. cit. (n. 12), p. 21. Several of Gutenberg's assistants spread abroad after the siege of Mainz. Pannartz and Sweynheym were the first to print outside of Germany; King, op. cit. (n. 24), pp. 259-61.

²⁶ Op. cit. (n. 24), p. 264.

²⁷ Op. cit. (n. 24), p. 323; op. cit. (n. 12), p. 21.

²⁸ Op. cit. (n. 10), pp. 170, 186.

²⁹ Claudius Ptolemaeus, *Cosmographia Roma 1478*, with an introduction by Raleigh A. Skelton (Amsterdam 1966), p. V.

³⁰ Documenti in: SUBIACO, Archivio di Santa Scolastica, Arca XXVII n. 27, 18 agosto 1461, f. 9 e Arca XXVII n. 41, 26 giugno 1475, p. 149-50; As cited in Azzini, 2010, op. cit. (n. 10), p. 359.

³¹ Op. cit. (n. 10), p. 150.

use of the new Roman character, in combination with the layout of the text page, gives the page an elegant look. This is comparable with that of a handwritten manuscript.³²

The maps are very well executed copper engravings. The world map is on Ptolemy's first conical projection. Except for the map of Taprobana, the regional maps are on the trapezoid projection, which Nicolaus Germanus claimed to have invented. The map of Taprobana is based on Marinus' cylindrical projection.³³ In the Rome *Cosmography* the letters on the maps were struck into the copper plate with letter punches.³⁴ They were not engraved like in the Bologna *Cosmography* and in Berlinghieri's *Geography*. This increased the practical use greatly. Using punches was experimental in cartography, but already in use in music printing. The engraving of the Rome *Cosmographia* was also innovative. The woods were expressed in a refined way, using only black and white and without the use of colour, as applied in manuscripts. Mountains were depicted in a novel way, by the so-called mole mounds. A clear graphic distinction was made between earth and water. By a perfect play with the letter forms, a harmonious relationship between script and graphic design was created. Finally, rare monumental features, such as small votive elements were engraved.³⁵ The graphic techniques used in the production of these maps were so refined that they were also easy to interpret uncoloured. That is probably the reason that maps belonging to the Rome editions are seldom found coloured.

The size of the maps, which extend over the entire surface of the double page, have protected the whole from excessive trimming, even after subsequent rebinding. The maps of the various editions of the Rome *Cosmography* were printed in two halves. After printing, they were assembled into whole maps.³⁶ Due to different qualities of the impressions of both halves, many maps are not homogenous in their appearance. The paper used for this edition is of good quality. The size of the sheet was approximately 430 x 580 mm.³⁷

We studied several copies in person. Two watermarks were identified in the paper of the text pages.³⁸ The first is a crossbow in a circle. This is a typical watermark of Italian origin. It is traceable to paper manufacturers from Fabriano and occurs in other incunable books printed by Sweynheym and Pannartz. The second watermark represents the evangelist, Marcus. This could indicate paper from Treviso. In the paper used for the maps, the watermark crossbow in a circle seems exclusively present.³⁹ Azzini suggests that the maps were printed before the text because the paper used for the text contains both watermarks (Fig. 21-2).⁴⁰ The paper left over after the maps were printed, was mixed with paper that was still in stock for printing the text.⁴¹ However, we have discovered one map with the watermark of the evangelist Marcus in an atlas offered at an auction.⁴² This can be explained. Paper formed the biggest cost for printing a book. This could amount to 50% of the total production costs, as a result of which printers usually bought precise supplies. They used the paper completely before they bought more. It is therefore not uncommon, as Neil Harris already pointed out, that the analysis of a single edition reveals an almost archaeological sequence of layers of paper, that reflect the stages of the work in its structure.⁴³

The codex Ebnerianus, now in the New York Public Library, served as the prototype for the Rome edition of 1478.⁴⁴ We do not know the number of copies of the *Cosmography*. An edition of 275 copies was usual for books published by Sweynheym and Pannartz in previous years. Skelton assumes the 1478 edition of the *Cosmography* contained 500 copies. Printing an atlas is much more expensive compared

³² Ibid, pp. 157-58.

³³ Skelton, op. cit. (n. 29), p. VIII.

³⁴ Tony Campbell, 'Letter punches a little-known feature of early engraved maps', *Print Quarterly*, 4 (1987), pp. 151-54.

³⁵ Op. cit. (n. 10), pp. 162-63.

³⁶ Donald L. McGuirk Jr, 'Ruysch World Map: Census and Commentary', *Imago Mundi*, 41 (1989), p. 133.

³⁷ Op. cit. (n. 10), p. 157.

³⁸ Marcel Destombes, *Catalogue des cartes gravées au xv^e siècle* (No place 1952), p. 55.

³⁹ Robert H.J. Peerlings, Frans Laurentius, Jaap van den Bovenkamp, 'The watermarks in the Rome editions of Ptolemy's *Cosmography* and more', *Quaerendo* 47, (2017), p. 315.

⁴⁰ The watermark crossbow in a circle: Briquet, op. cit. (n. 11), vol. 1, p. 52, no. 746; The watermark evangelist Marcus: Ibid., vol. 3, p. 539, no. 10474. Not all variants found are displayed.

⁴¹ Op. cit. (n. 10), pp. 155-56.

⁴² The evangelist Marcus watermark was present in one map only of a copy at auction at Bonham's in New York on March 9, 2018.

⁴³ As cited in Azzini, op. cit. (n. 10), p. 156.

⁴⁴ Op. cit. (n. 29), p. VI.

to printing a book. Engraving the copper plates generates extra costs. In addition, printing copper plates is much more laborious than printing text pages. Thus, to make it profitable, a print run of 500 copies seems more likely for an atlas.⁴⁵ A special copy of the 1478 edition belonging to Columbus is preserved in Madrid. He took it with him on his expeditions and added his own notes.⁴⁶ The discovery of the system of coordinates has helped people like Columbus to dare to look for the unexplored area and the route to the east. It is thought that the erroneous calculation of the circumference of the earth by Ptolemy contributed to Columbus' perseverance and assumption of being able to reach India with his journey to the west.⁴⁷ The Rome edition has been reissued with modifications of the text in 1490 and with modifications of the text and the maps in 1507 and 1508.⁴⁸

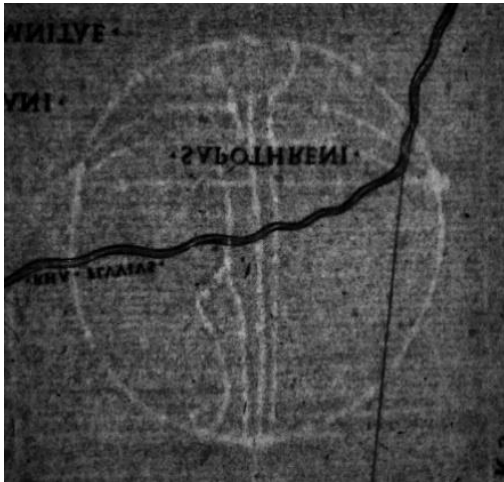


Fig. 21



Fig. 22

The 1482 Ulm *Cosmography* edition

In July 1482, the first printed version of the *Cosmography*, outside of Italy, appeared. It was published in Ulm by Lienhart Holle and contains woodcut maps.⁴⁹ The wood blocks were carved by the woodcutter Johannes Schnitzer of Armszheim. Despite the limitations of wood as a medium for cutting such large images with small tightly packed inscriptions, the result is very refined. The woodcutter must have been exceptionally gifted. The world map of this edition is the earliest printed map to bear an engraver's signature. He also left his signature on the regional maps by engraving the Roman capital N in reverse.⁵⁰ The world map is redrawn on the homeotheric projection and extended to the north-west. All the regional maps, except two, are redrawn on the trapezoid projection.⁵¹

Uncoloured, the woodcut maps of the Ulm 1482 edition are almost indecipherable. Therefore, almost all copies were coloured to differentiate between land, sea, and mountains. The colour composition used for the Ulm 1482 edition is very appealing. Furthermore, it may be the first edition with modern maps. Apart from the twenty-seven classic maps, it contains a modern map of Spain, France, Italy, and Palestine, as in Berlinghieri's *Geography*. Additionally, the important modern map of Northern Europe, based on the work of Claudius Clavus, was added. According to Fischer, a codex by Nicolaus Germanus, preserved in Schloss Wolfegg, served as an example for the Ulm edition.⁵² The fifteenth century printers of an atlas had to gain experience step by step, as they were the first. The Ulm edition shows evidence of resetting text with map descriptions. It was the consequence of an error by a

⁴⁵ Ibid, p. X.

⁴⁶ Ibid, p. X.

⁴⁷ Op. cit. (n. 12), p. 17.

⁴⁸ Robert H.J. Peerlings, Frans Laurentius, Jaap van den Bovenkamp, 'New findings and discoveries in the 1507/8 Rome edition of Ptolemy's *Cosmography*', *Quaerendo* 48, (2018), pp. 139-62; Peerlings, op. cit. (n. 39), pp. 307-27.

⁴⁹ Stevens, op. cit. (n. 23), p. 40.

⁵⁰ Claudius Ptolemaeus, *Cosmographia Ulm 1482*, with an introduction by Raleigh A. Skelton (Amsterdam 1963), p. VII.

⁵¹ Skelton, op. cit. (n. 50), p. VI.

⁵² Ibid, p. V.

compositor or pressman in Holle's printshop. Therefore, the Ulm atlas exists in different appearances. No chronological order of printing of the Ulm 1482 edition could be established by Skelton.⁵³

Stevens has studied twelve copies of this edition. In his opinion the wood blocks of the regional maps seem to have remained unaltered.⁵⁴ The text on the verso of the maps was first printed from wood blocks, later in type with woodcut borders. In contrast with the maps, changes have been made to the text, but the leaf mirror always has the same border. As result, twenty-five maps are known in two states and two maps in three states.⁵⁵ In Holle's shop, sheets of different states in various combinations must have been assembled into different copies of the atlas. Each of Stevens' copies is therefore different from the others.⁵⁶ This creates the bibliographical confusion Skelton describes.⁵⁷ Furthermore, we must remember that books in those days were also sold unbound. The buyer could have his book compiled by the bookbinder in the way he wished. This way, different sets of text and maps could have been assembled randomly.

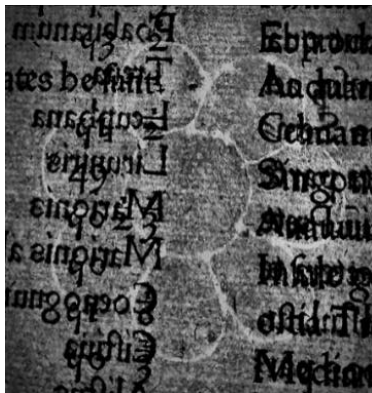


Fig. 23

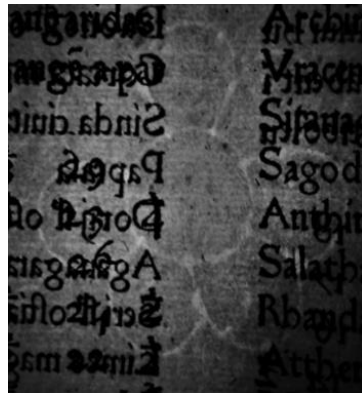


Fig. 24

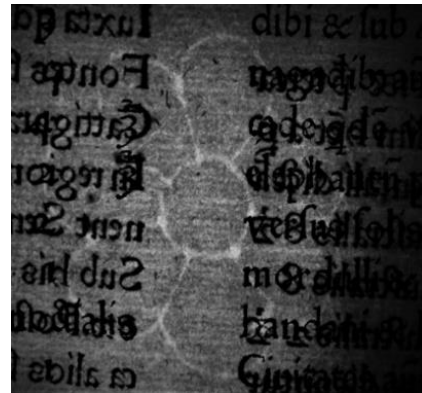


Fig. 25

Destombes describes only one watermark in the paper of this edition. This is a seven-leaf flower, and it was only found in the paper used for the text pages (Fig. 23-5). According to Destombes, the paper used for the maps of this edition was without any watermark.⁵⁸ We studied a copy in person and some maps of this edition in a private collection with the same observations concerning the watermarks.⁵⁹ The lack of watermarks in the maps will make further research of this edition much more complex. Despite the beauty of the Ulm 1482 edition, especially when the deep blue lapis lazuli was applied, Holle's publishing house proved to be a commercial failure.⁶⁰ His stock of type, blocks, and printed sheets passed into the hands of Johann Reger.⁶¹

The 1486 Ulm *Cosmography* edition

The 1486 Ulm edition came from the press on July 21. The maps were reprinted from Holle's blocks. Apparently, the addition of woodcut headings, such as *PRIMA EVROPE TABVLA* and so on, was the only alteration. The stock of the 1482 edition was not exhausted by 1486. The letters, wood blocks, and printed sheets were taken over by the Ulm based Johann Reger, agent of Giusto de Albano, of Venice. In addition to some minor changes to the text pages, he compiled a gazetteer or geographical index and added this to the text and maps. It is known as the *Registrum Alphabeticum*.⁶² A note was prefixed,

⁵³ Ibid, p. IX.

⁵⁴ Ibid, p. VIII.

⁵⁵ Ibid, p. VIII.

⁵⁶ Op. cit. (n. 23), p. 26.

⁵⁷ Op. cit. (n. 50), pp. VIII-IX.

⁵⁸ Destombes, op. cit. (n. 38), p. 59. WZIS, reference number DE8100-IncFol8476_999g; WZIS, reference number DE8100-IncFol13539_999; WZIS, reference number DE8100-IncFol13539_999a; WZIS, reference number DE8100-IncFol13539_999b.

⁵⁹ Koninklijke Bibliotheek Den Haag, shelfmark KW 170 A 7. The colours of the illuminations on the text pages and the colouring of the maps of this copy are similar but totally different from what is usual for copies of the 1482 as well as the 1486 edition.

⁶⁰ Op. cit. (n. 10), p. 303.

⁶¹ Op. cit. (n. 50), p. X.

⁶² Ibid, p. X.

explaining its purpose and use. It is much more than a simple alphabetical list. It gives references to places in the text and explains how to locate places on the maps.⁶³ Reger further added an anonymous tract with the title "De locis ac mirabilibus mundi".⁶⁴ It concerns a description of the world of curiosities and wonders of the world in a chorographic setting.⁶⁵ In the map section the descriptive texts were reset with only minor adaptations and without the decorative borders as in the 1482 Ulm edition. The maps were reprinted with no other change than the addition of woodcut headings, for example *PRIMA EVROPE TABVLA*. The heading for the modern map of Spain is cut upside down at the foot of the block, below the map. The order of the maps is as in the 1482 edition.⁶⁶ The maps of this edition are coloured differently. Lapis lazuli was regularly and extensively used to colour the 1482 edition. This blue colour applied for the seas was changed in a much less attractive and more inexpensive brown colour in the 1486 edition. In those days, lapis lazuli was as expensive as gold. Possibly these costs contributed to the commercial failure of Holle's publishing house in 1482.⁶⁷

In Munich we studied a 1490 Rome *Cosmography* edition copy.⁶⁸ The maps in this copy turned out to be from an Ulm 1486 edition. In the paper used for this edition, Destombes describes only one watermark: a simple form of a mountain with three peaks and a large cross on top encircled by a snake. He does not mention if it was found in the text pages or in the paper used for the maps.⁶⁹ We found this watermark in the copy in Munich, as well as an eight-leaf flower, and an ox head with a crown on top, all three in the paper used for the maps (Fig. 26-8).⁷⁰



Fig. 26



Fig. 27

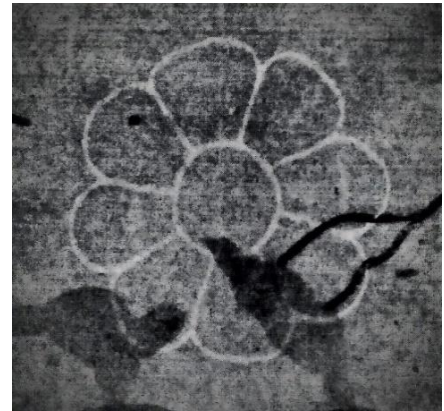


Fig. 28

⁶³ Patrick G. Dalché, 'Chapter 9 The reception of Ptolemy's *Geography*', *The History of Cartography Volume three* (Chicago 2007), p. 348.

⁶⁴ Op. cit. (n. 50), p. X.

⁶⁵ Dalché, op. cit. (n. 63), p. 348.

⁶⁶ Op. cit. (n. 50), p. X.

⁶⁷ Op. cit. (n. 10), p. 303.

⁶⁸ Bayerische Staatsbibliothek, shelfmark Inc. c.a. 2439.

⁶⁹ Op. cit. (n. 38), p. 65.

⁷⁰ The watermark simple form of a mountain with three peaks with a large cross on top encircled by a snake: Briquet, op. cit. (n. 11), vol. 3, p. 596, no. 11832; The watermark ox head with a crown on top: WZIS_DE8100-PO-70651; The watermark eight-leaf flower: Briquet, op. cit. (n. 11), vol. 2, p. 374, no. 6601; Gerhard Piccard, *Wasserzeichen Blatt, Blume, Baum* (Stuttgart 1982), no. 824.

The 1490 Rome *Cosmography* edition

The 1478 Rome edition was reissued on November 4, 1490 by Petrus de Turre. The Portuguese discovery of the passage to the Indian Ocean by Bartholomew Dias in 1488 led to a growing interest in atlases. Petrus de Turre saw a commercial opportunity and bought the copper plates used by Arnold Buckinck. In 1490 the plates were still in excellent condition, having the original sharpness and quality.⁷¹ The text was revised as follows. To Buckinck's text of the *Cosmography*, the index of places (Registrum Alphabeticum) and the tract "De locis et mirabilibus mundi" from the 1486 Ulm *Cosmography* by Johan Reger were added, respectively preceding and following Ptolemy's text.⁷² Unlike the *Cosmography* editions printed in Bologna and Ulm that contain multiple states of maps, there have been no changes to the copper plates for the 1478 and 1490 Rome editions. However, in the last two Rome editions of 1507 and 1508 adjustments were made and discovered by us.⁷³ Destombes describes the watermarks cardinals hat, ladder, the French lily, and a T in a circle for the 1490 edition.⁷⁴ He gives no information whether the watermarks were present in the text pages or in the maps, or both. We studied several copies in person and found variations of the tau cross in a circle with a cross on top, a ladder in a circle with a star



Fig. 29



Fig. 30

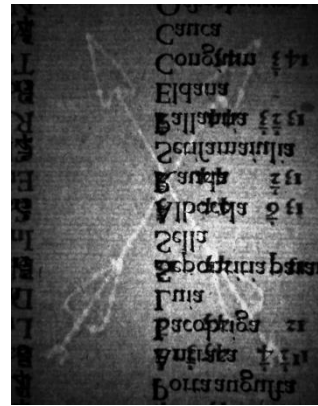


Fig. 31

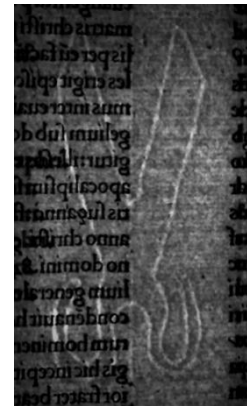


Fig. 32

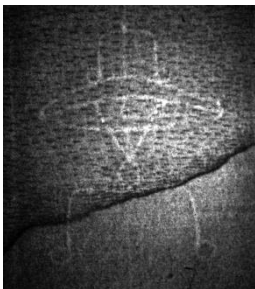


Fig. 33

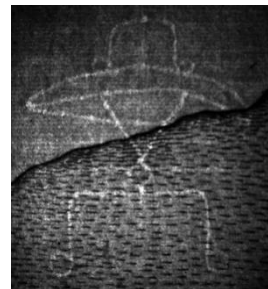


Fig. 34

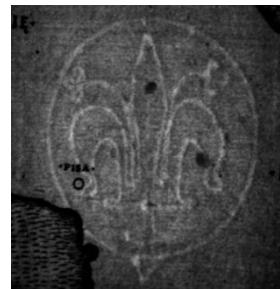


Fig. 35



Fig. 36

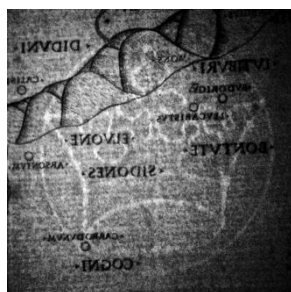


Fig. 37



Fig. 38

⁷¹ Op. cit. (n. 29), p. X.

⁷² Adolf E. Nordenskiöld, *Facsimile atlas to the early history of cartography with reproductions of the most important maps printed in the xv and xvi centuries* (New York 1973), p. 16; op. cit. (n. 50), p. XI.

⁷³ Peerlings, op. cit. (n. 48), pp. 143, 150-53.

⁷⁴ Op. cit. (n. 38), p. 58.

on top, crossed arrows, and the watermark scissors in the text pages (Fig. 29-32).⁷⁵ In the paper used for the maps, variations of the cardinal's hat and a French lily in a circle were regularly found. Variations of the watermark crown in a circle were very rarely present. In only one map a five-leaf flower watermark was found (Fig. 33-8).⁷⁶

The sixteenth century

In the beginning of the sixteenth century the mentioned atlases were no longer up to date. America was discovered and the Cape of Good Hope and Cape Horn were run. The circumference of the earth was revised fundamentally. Africa became much larger, and America moved more towards the west. The world map by Rosselli from 1506 shows this.⁷⁷ Nevertheless, in the sixteenth century two more Rome editions were published in 1507 and 1508.⁷⁸ Other editions of Ptolemy's *Cosmography* published in that century are from Sylvanus 1511, Waldseemüller 1513 and 1520, Grüninger 1522 and 1525, Servetus 1535 and 1541, Münster 1540, 1542, 1545 and 1552, Gastaldi 1548, Ruscelli 1561, Mercator 1578, and Magini 1596. To the later editions more and more modern maps and maps of new areas were added. In the middle of the sixteenth century, the first books with exclusively modern maps were assembled to order by Lafreri and Tramezini. At the end of the sixteenth century the atlases by Ortelius, De Jode, and Mercator appeared. We have limited ourselves here to describing only the incunable atlases. The one not yet discussed is Francesco Berlinghieri's *Geography*, which we will discuss in the next chapter.

⁷⁵ Op. cit. (n. 39), p. 317-19; The watermark tau cross in a circle: Gerhard Piccard, *Wasserzeichen Kreuz* (Stuttgart 1981), no. 99; The watermark ladder in a circle with a star on top: Briquet, op. cit. (n. 11), vol. 2, p. 345, no. 5920; The watermark crossed arrows: Ibid., p. 362, no. 6280; The watermark scissors: Ibid., p. 237, no. 3677; Gerhard Piccard, *Wasserzeichen Werkzeug und Waffen* (Stuttgart 1980), no. 881. Not all variants found are displayed.

⁷⁶ The watermark cardinal's hat: Briquet, op. cit. (n. 11), vol. 1, p. 224, no. 3391; Bernstein Memory of Paper, Ref. number IT5235-PO-32312; The watermark lily in a circle: Gerhard Piccard, *Wasserzeichen Lilie* (Stuttgart 1983), no. 945; The watermark crown in a circle: Corpus Chartarum Fabriano reference number Z01131; Nikolai Petrovich Likhachev, *Likhachev's Watermarks* (Amsterdam 1994), nr. 401; Corpus Chartarum Fabriano reference number Z01166, Z01167, and Z01278; The watermark five-leaf flower: no reference found. Not all variants found are displayed.

⁷⁷ Roberto Almagià, 'On the cartographic work of Francesco Rosselli', *Imago Mundi*, 8 (1951), pp. 27-34.

⁷⁸ Op. cit. (n. 48), pp. 139-62.

CHAPTER 3

Berlinghieri's GEOGRAPHY

Francesco Berlinghieri

Francesco di Niccolò Berlinghieri was born on September 17, 1440, in Florence as son of Niccolò and Pippa.¹ He died on February 17, 1500 and was buried in Florence in the Basilica di Santa Croce.² Berlinghieri came from an old and prosperous Florentine family. Some biographical information about him is available.³ His family was involved in Florentine political affairs for over 200 years. An ancestor, Raniero Berlinghieri, mediated between Siena and Florence for an important treaty in 1201. Members of the family served many times as Priors of the *Signoria*, from the mid-fourteenth to early-sixteenth centuries. The *Signoria* can be regarded as Florence's government.⁴ Berlinghieri married Alessandra in 1475 or 1476. They had a son, named Luigi and an anonymous daughter. Berlinghieri's father died in 1469 and his older brother Benedetto between 1476 and 1480. Nothing is known about the death of his mother Pippa.⁵ His household included the families of two of his brothers, Giorgio and Antonio, as well as the crippled widow of his oldest brother Benedetto. The family's mansion was situated in the parish of San Simone, around the church Santa Croce. Berlinghieri managed two additional family properties in Tuscany. One was situated in Mugello, the other in San Giorgio a Ruballa.⁶

During the fifteenth century, Florence was a centre for the study of the classics. Berlinghieri was a pupil of the Greek teacher Joannes Argyropoulos.⁷ This scholar had worked as a teacher in Constantinople until he temporarily went to Padua to study medicine and philosophy. After the Ottoman conquest of Constantinople in 1453, he returned to Italy and joined the diaspora of Greek scholars.⁸ Cristoforo Landino was Berlinghieri's teacher in poetry and Latin. Landino is also known as commentator of Dante and Petrarca and as a high ranked person active in Florentine politics.

Berlinghieri was associated with humanists in the circles of Cosimo de' Medici's son Lorenzo.⁹ He was also a friend of the poets Luca and Luigi Pulci and a member of the platonic academy under the leadership of the neoplatonist Marsilio Ficino (Fig. 39).¹⁰ Ficino was one of the most sought-after doctors in Florence and was in contact with the most influential persons, including the Pazzi and the Medici. Cosimo de' Medici was a patron of this platonic academy.¹¹ Ficino has dedicated book seven of his collected letters to Berlinghieri. Other volumes were dedicated to illustrious people, such as Matthias Corvinus King of Hungary and Giuliano de' Medici. Ficino was further involved with Berlinghieri in relation to politics, marriage counseling, financing, and translation matters. Berlinghieri co-financed the printing of Ficino's Latin translation of the works of Plato from the only known complete manuscript at the time in Greek. It was in possession of Cosimo de' Medici. He rewarded Ficino for his translation with

¹ Consiglio regionale del Piemonte, Biblioteca Nazionale Universitaria di Torino, Centro Studi Piemontesi, Fondazione CRT, *Berlinghieri Geografia* (Torino 2006), p. 43.

² Consiglio regionale del Piemonte, op. cit. (n. 1), p. 43.

³ Roberto Almagià, 'Osservazioni sull'opera geografica di Francesco Berlinghieri', *Archivio della R. deputazione romana di storia patria*, 68 (1945), p. 212; Assunto Mori, 'Un geografo del Rinascimento. Francesco di Niccolò Berlinghieri', *Archivio Storico Italiano*, 13, (1894), pp. 341-48. As cited in Almagià, op. cit. (n. 3), p. 212; Arnolfo della Torre, *Storia dell'Accademia Platonica in Firenze* (Firenze 1902), pp. 664-68, as cited in op. cit. (n. 3), p. 212.

⁴ Sean Roberts, *Printing a mediterranean world: Florence, Constantinople, and the renaissance of Geography* (London 2013), p. 48.

⁵ Wilhelm Bonacker, Dr. Ernst Anliker, 'Francesco di Niccolò Berlinghieri und seine Ptolemäus-Ausgabe vom Jahre 1482', *Der Schweizer Sammler*, 6 (1932), p. 23.

⁶ Roberts, op. cit. (n. 4), p. 47.

⁷ Claudius Ptolemaeus, *Francesco Berlinghieri Geographia Florence 1482*, with an introduction by Raleigh A. Skelton (Amsterdam 1966), p. V; The maps depicted in the book are based on the maps from the following copy: The British Museum, shelfmark 163.b.1.

⁸ Ross King, *The bookseller of Florence* (Amsterdam 2021), p. 222.

⁹ Skelton, op. cit. (n. 7), p. V.

¹⁰ Roberts, op. cit. (n. 4), pp. 49, 55, 78.

¹¹ Op. cit. (n. 7), p. V; King, op. cit. (n. 8), pp. 245, 292.

a house. It made Plato's philosophy accessible again to a wider public. Berlinghieri and Ficino acted as mutual proofreader of each other's documents. Ficino wrote the recommendation to Federico da Montefeltro d'Urbino in the *Geography* and was mentioned with admiration (Fig. 40). Thus, the appreciation was reciprocal.¹² It seems that the platonic academy had an inspiring impact on its members. Landino, Ficino, and Berlinghieri all published an impressive work in the same time span with mutual efforts and help.



Fig. 39

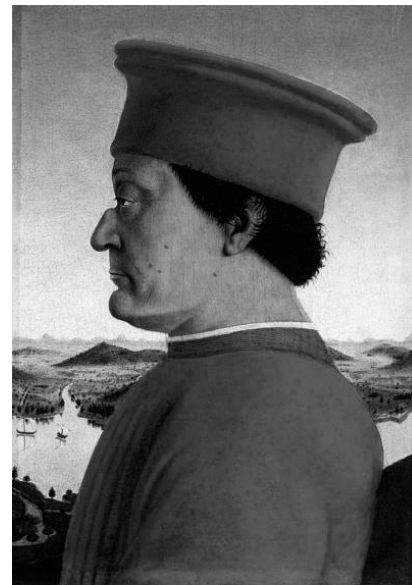


Fig. 40

In Florence, Berlinghieri held several public offices. He was, as many of his ancestors, Prior of the *Signoria* himself in 1471. In addition, he was conservator of the laws, as evidenced by a document dated August 1482. He also served on the Great Council of the Florentine republican government established under Girolamo Savonarola from 1494 to 1498. Furthermore, he was a speaker at the court of Mantua as ambassador for the Medici family in 1479-1480.¹³ Berlinghieri brought objects from Cardinal Francesco Gonzaga's renowned collection of antiquities, purchased by Lorenzo in 1480, to Florence. From this may be concluded that he had a close relationship with Lorenzo de Medici. However, it was not always a good one. Since the time of Lorenzo's grandfather Cosimo, the Medici and the Berlinghieri jointly owned a silk manufactory. It was operated by the Berlinghieri's. A dispute over the control of the factory, caused by a death in 1480, made Lorenzo de Medici eventually file a suit against them in 1485.¹⁴ Berlinghieri was appointed as one of the *Buonomini* in 1493. Their story begins in 1442 and they still exist today. The prior of the monastery of San Marco, Antonino Pierozzi, called together and appointed honorable men from each district of Florence. They helped people in need.¹⁵

The literary production of Berlinghieri is limited. Two holy orations were recited in the church of San Lorenzo. He also wrote a protest. This was recited by him in the *Signoria* of Florence on January 15, 1478. It was a plea to preserve justice and freedom; a short rhetorical exercise that is interesting because it is mentioned several times in the verses of the *Geography*.¹⁶ The orations were later published in a collection of *Orationi* in Venice, in 1584, by Francesco Sansovino. Another literary activity was Berlinghieri's involvement with the publication of Plato's *Opera* by Marsilio Ficino. We found notes in the diary of the printing press of the convent of San Jacopo di Ripoli concerning his visits to the convent together with Filippo Valori, in 1483 and 1484.¹⁷ They refer to font, layout, and the number of copies of the book, being 1025.¹⁸ This report in the diary is followed by a large number of notes about

¹² Op. cit. (n. 4), p. 49.

¹³ Op. cit. (n. 3), p. 212, 225; op. cit. (n. 4), pp. 48-9.

¹⁴ Sean Roberts, *Cartography between cultures: Francesco Berlinghieri's Geographia of 1482* (Michigan 2006), p. 268.

¹⁵ Op. cit. (n. 3), p. 212; Consiglio regionale del Piemonte, op. cit. (n. 1), p. 23.

¹⁶ Ibid, p. 212; p. 23.

¹⁷ Emilia Nesi, *Il diario della stamperia di Ripoli* (Firenze 1903), pp. 27-8, 104-08, 112.

¹⁸ Melissa Conway, *The diary of the printing press of San Jacopo di Ripoli 1476-1484* (Firenze 1999), pp. 17, 46, 268-72, 276.

visits by Valori for payments of the book.¹⁹ Berlinghieri's most important work is his *Geographia*; an adaptation in Italian verses in *terza rima* of the geographical work of Ptolemy. It is dedicated to Federico da Montefeltro, Duke of Urbino. This is apparent from an inaugural letter by Berlinghieri himself and an apologue by Marsilio Ficino on the first pages. Almagià described Berlinghieri as a humanist and more a capable verse writer than a poet.²⁰ In his opinion he only had very modest competences in the field of cartography and was certainly not a cartographer. However, one could argue that this applies to all the creators of printed editions of the *Cosmography* prior to 1500. They all seem to be based on manuscripts and were not innovative from a cartographic point of view. Dalché writes that this negative assessment is changing, as it becomes clear that the *Geographia* should be judged within its cultural context.²¹ The work was realized by Berlinghieri as a member of Ficino's Platonic Academy and in the close circle of Lorenzo de Medici. The translation into Tuscan dialect and the numerous echoes of Dante and Petrarch were all part of the exaltation of Florence required by Lorenzo il Magnifico. At the same time, other classical texts were converted in vernacular language by members of Ficino's academy.²² Next to the printed edition, two manuscript versions of the *Geographia* by Berlinghieri are known. One is present in the Vatican City, the other is kept in Milan.²³

The practice of printing in Florence around 1480

In the first twenty years after the invention of book printing, printing was mainly concentrated in Germany. Schweynheim and Pannartz founded the first printing house in Italy, Rome, 1464. They published their first work in 1465. Five years later, there were already so many printers active in Italy that they were faced with the problem of unsold stock. Venice shows figures concerning 100 printing offices, 268 printers and the production of 2 million books between 1481 and 1501.²⁴ Cennini seems to have been the first Italian printer, as well as the first one in Florence, in 1471-72, with a very limited output. To finance his business, he sold his wife's house, mortgaged his own, and borrowed 200 florins from a goldsmith. In 1471, his first book appeared. In 1472, he added another printing house. Both came to an almost immediate halt due to financial difficulties. This was partly due to the fact that works printed by Cennini in the meantime had already been published elsewhere. He tried to solve his debts by offering unsold copies as collateral and finally 44 copies were given to a pedlar from Lombardy.²⁵ The printing offices with the largest production in Florence between 1476 and 1484 were, in order of importance, those of San Jacopo di Ripoli and Niccolò Tedesco. In Tedesco's printing office Berlinghieri's *Geography* was printed. Other printing offices active in Florence between 1476 and 1484, were led by Antonio Francesco Veneto, Bartolomeo de Libri, Don Ippolito, Francesco di Dino, and Antonio Miscomini.²⁶

Apart from the technical problems, raising the start-up capital and covering the running costs were a problem for beginning printers. Setting up a printing workshop would have cost at least 35 florins, considerably more than the average annual rent for such a workshop. In addition to the start-up costs, operating capital was needed for the paper and the man-hours to produce hundreds of copies of a book in a few months in the uncertainty that they would sell. A producer of manuscripts did not have such a level of general and running costs for a long time.²⁷ A *diario* or day to day report of the printing office in this monastery, discovered by the Dominican Friar Fineschi in the archives of the San Jacopo di Ripoli convent in Florence in 1781, confirms these financial challenges.²⁸ In 1478, Domenico entered into a

¹⁹ Nesi, op. cit. (n. 17), pp. 27-8, 104-08, 112; Conway, op. cit. (n. 18), pp. 17, 46, 268-72, 276.

²⁰ Op. cit. (n. 7), p. V.

²¹ Patrick G. Dalché, 'Chapter 9 The reception of Ptolemy's *Geography*', *The History of Cartography Volume three* (Chicago 2007), pp. 285, 322.

²² Dalché, op. cit. (n. 21), pp. 285, 322.

²³ The manuscript for Federico d'Urbino is present in the Biblioteca Apostolica Vaticana, shelfmark Urb.lat.273. It can be consulted digitally: https://digi.vatlib.it/view/MSS_Urb.lat.273; The manuscript for Lorenzo de Medici is present in the Biblioteca Nazionale Braidense Milano, shelfmark AC.XIV.44, first AN.XV.26. From now on they will be referred to as the Vatican manuscript and the Braidense manuscript respectively.

²⁴ Op. cit. (n. 18), p. 10.

²⁵ Op. cit. (n. 8), pp. 308-09.

²⁶ Op. cit. (n. 18), pp. 305-14.

²⁷ Op. cit. (n. 8), p. 302.

²⁸ Op. cit. (n. 18), p. 1.

business arrangement with the librarian Bartolo di Domenico, also known as Bartolo *miniature*, which indicates that he must have been active as an illuminator of manuscripts. He is an example of someone who made the transition from manuscripts to printing. He would act as a publisher and take over the financial burden of the wages of the workers of the printing office and make new investments not only in the printing office but also in other enterprises of the Ripoli convent. Fra Domenico also had dealings with Vespasiano da Bisticci.²⁹ The printing office of the Ripoli convent was the first professional one in Florence. The diary is the only extant primary source of a printing house from the fifteenth century. Among other things, it contains accounts about the management of windmills, a farm, and the possession of a herd of boar. It was composed of bundles of loose leaves. Many abbreviations, related to specific activities, were used whose meaning got lost in time. It proved to be difficult to read and interpret the loose leaves and it was hard to put them in the right order. In 1887, Roediger started to unravel the information.³⁰ His work was interrupted halfway through the process. Nesi continued the work about fifty years later.³¹ Conway, in her thesis, finished the research.³²

According to the diary, the printing office existed from 1476 until 1484. Its activities ended shortly after the death in August 1484 of Friar Domenico who ran the office. Domenico was supported by the Prioress. Some nuns helped with the typesetting from time to time. The office published about one hundred titles in eight years. The first book had a print run of 500 copies.³³ Some of the first books were printed so unprofessionally that the pages in some places were up to eight mm off-centre. During the printing process, Fra Domenico tried to remedy the situation by asking a blacksmith to make a set of triangular pins for the tympanum with which the paper could be pinned so that it could no longer shift. Carelessness in collecting the quires was a bigger problem. Copies sometimes lacked twenty pages of text. Fra Domenico noted that a large number of books had to be considered as failures.

Some printed copies were illuminated by hand. One without illumination cost two lire and 10 soldi. A book with decorations cost almost twice as much: four lire and 10 soldi. Fra Domenico hired rubricators to provide the pages with red letters, but he also had more luxurious copies made in several workshops with extra decorations by miniaturists who had decorated manuscripts on parchment earlier in their careers. Domenico struggled to sell his books. He had to find several methods of sale for his relatively large print runs, which proved to be difficult. The librarian Giovanni di Nato took his books in stock, for example. Nevertheless, unsold copies of the *Vita di Santa Caterina* were still available in 1781. To solve the problem, Fra Domenico also practised barter. He exchanged unsold books for a batch of firewood, the cuttings of a mulberry tree, a pair of new shoes, and the services of a surgeon who treated one of his workers. Printed pamphlets and the like provided another market to keep the printing office running. A poem published as propaganda for the Medici against the Pazzi, Federico d'Urbino, the pope, and King Ferrante of Naples was printed by Fra Domenico and traded by the bookseller Giovanni di Nato who had a shop at the Porta al Prato near Ripoli. De Nato had some ballad singers in his clientele who would recite it in the street and then sell the booklet to passers-by. They earned a penny with this sale, just like hawkers and street vendors.³⁴

The nature of the printed works was 56 % religious, 18 % vernacular poetry, 6 % classics and antiquities, 5 % Latin grammar, 3 % popularised versions of ancient works, 3 % vernacular prose, 2 % humanistic, 2 % scientific theology in Latin, 2 % popular scientific medical, and 3 % miscellaneous. This matches with the output of secular printing houses in Florence of those days.³⁵ Seven out of ten Florentines could read whereas in other European cities only one out of four could.³⁶ About 60 % of the printed works was sold to clergy. The next group of buyers were professionals, like doctors, goldsmiths, printers, brokers, bailiffs, and teachers. They were followed by traders and skilled workers such as barbers, blacksmiths, carpenters, weavers, bricklayers, traders, and flax makers. From the small remaining group of customers, no further information is available. These figures must be interpreted

²⁹ Op. cit. (n. 8), p. 376.

³⁰ Op. cit. (n. 18), p. 3.

³¹ Ibid, p. 3.

³² Ibid, p. 3.

³³ Ibid, p. 19.

³⁴ Op. cit. (n. 8), pp. 366-67.

³⁵ Op. cit. (n. 18), p. 67.

³⁶ Op. cit. (n. 8), p. 14.

with caution, as they are based on registered sales to persons in the diary. Probably not every single book sold was registered. In addition, books were also sold to booksellers.³⁷

At the printing office they worked fourteen hours a day, six days a week.³⁸ The first work of about twelve to thirteen leaves of paper cost seven soldi. A later work of 160 leaves cost two lire ten soldi.³⁹ An experienced employee of the Ripoli printing office was paid twelve florins a year. Compared to other printing offices this is quite low. Perhaps this is the reason that the Ripoli printing office regularly lost an employee. In later accounts, wages of four to five florins a month for an experienced printer or typesetter are found. A certain Antonio received a salary of five florins a month. He had become some sort of manager and business partner of Friar Domenico. To achieve this raise in salary, Antonio went on a strike. Nevertheless, he left the printing office at some point.⁴⁰ In 1484, Miscomini paid a typesetter four florins a month and a printer between one florin and ten lire, which is almost two florins. He paid an inker one florin a month. The annual salary of an apprentice was four florins.⁴¹ Pollack described salaries of two and a half florins for an inker and four to four and a half florins a month for a typesetter and a printer. A foreman cost five to nine ducats.⁴² King mentions a salary between 40 and 60 florins a year for teachers and employees of international banks such as those of the Medici.⁴³ Conway described the cost of some other things at the time to create an idea about the salaries. For example, renting a house cost thirty-six lire a year, a gamblet four lire ten soldi, a bushel grain eighteen soldi, a piece of fish four and a half soldi and a bottle of wine five soldi.⁴⁴ In the diary many prices are given related to printing. The wood for a printing press cost six lire, cutting to size one lire, a marble stone for ink preparation one lire three soldi, processing the stone two lire, a spiral five lire five soldi, the rest four to five lire. The total cost of a printing press was more than twenty lire, which is about four florins. Many more figures are mentioned in the diary, for example for paper. The cost of so-called Median size paper, 35 x 52 cm, was five lire ten soldi per ream. Another price given for Median paper was six lire eight soldi. The price found for Chancery paper, 32 x 45 cm, was two lire six soldi per ream.⁴⁵ Domenico mostly used Chancery paper. A little larger size already led to a doubling of the price. Thus, bigger paper was exponentially more expensive. This can be explained, among other things, by the fact that it also became substantially thicker. So more raw materials were needed. Another interesting find in the diary is a record about the delivery of paper, halfway September 1481, for a book published on November 10, 1481. This indicates that paper was ordered per assignment, or per book. Fabriano, Colle, Prato, and Campo Corbolini are mentioned as cities that supplied paper. Prices for fonts, ingredients for ink and tools and instruments can also be found in the diary. The different recipes to make ink over the years are described as well. Domenico experimented with the mix of ingredients for ink to produce a good and inexpensive composition.⁴⁶ Cinnabar is found as an ingredient in the diary. It was used to make red ink. Miscomini used cinnabar to produce red ink in 1483 and 1484.⁴⁷ The diary further shows that Domenico acquired a second printing press at the beginning of the printing of the *Decamerone* at the end of 1482.⁴⁸ Until then, apparently, only one printing press was available.

Pollack states that it is hard to convert currencies of ducats, florins, guilders and the like to contemporary currencies.⁴⁹ Services and products that were expensive in those days can now be cheap and vice versa. Thus, he based his article and the comparisons on hours worked and hourly wages. He

³⁷ Op. cit. (n. 18), pp. 72-8.

³⁸ Michael Pollack, 'Production costs in fifteenth-century printing', *The Library Quarterly*, 39 (1969), pp. 320, 324, 329; Op. cit. (n. 18), p. 20.

³⁹ A florin was a gold coin that was first minted in Florence in 1252 and weighed 3.536 grams. A ducat and a guilder had about the same weight and value. At the beginning of the 15th century a florin was worth 75 soldi, in 1500 about 140 soldi. One florin was four to six lire between 1476 and 1484. Conway applies five and a half lire to a florin in her thesis. One lire is twenty soldi and one soldo is twelve denari. Pettas uses a conversion factor of 5.8 lire to a florin in his article about printing incunabula in Florence.

⁴⁰ Op. cit. (n. 18), pp. 61-2.

⁴¹ Op. cit. (n. 8), p. 105; It concerned the salary of an apprentice in a *cartolaio*.

⁴² Pollack, op. cit. (n. 38), p. 329.

⁴³ Op. cit. (n. 8), p. 268.

⁴⁴ Op. cit. (n. 18), p. 21.

⁴⁵ Ibid, p. 36.

⁴⁶ Ibid, p. 64.

⁴⁷ William A. Pettas, 'The cost of printing a Florentine incunable', *La Bibliofilia*, 75 (1973), p. 70.

⁴⁸ Op. cit. (n. 18), p. 60.

⁴⁹ Op. cit. (n. 38), p. 318.

extrapolated these to today. He described several costs related to printing, such as ink making, preparing ink balls, paper management and paper preparation for printing, cleaning of letters, repairs to printing press, maintenance of letters, groceries, interest, general costs of printing, supervision, preparatory work, rent premises, financing costs, costs of letters, costs of printing press, desired profit margin, and paying intermediaries. He argues that the cost of material is roughly equal to the cost of man-hours of a book printed around 1500. Then, he adds another third to unknown extra costs. In a larger print run the costs per copy go down, because if that is the case the printing costs, which are a large expense, are lower per copy.⁵⁰ Not all the prices for each of these subjects mentioned by Pollack can be found in the diary. Thus, despite the extensive figures available, not all the prices necessary to be able to calculate the cost price of a book, were found. The most reliable prices seem to be the ones mentioned in the diary or elsewhere for a finished book. Pettas described the price of a prayer book of 394 leaves, 788 pages, in octavo format. Thirty copies on good paper were sold for 2 florins each, equivalent to 11 lire.⁵¹ Printed on less quality paper it cost 1 florin 2 lire 17 soldi per copy. This is about 1.5 florin or 8.35 lire. Printed on parchment kidskin, the book costs 4.5 florins, or almost 25 lire each. This gives an indication of the influence of the quality of the paper, or the application of parchment, on the cost price of a book. In his book about the Giunti printing office, Pettas writes that 25 to 40 copies were enough to supply the local market.⁵² The purchase of an ordinary printed book involved half a month's salary for the working class. This class was, more than professionals, willing and motivated to lay down another half month's salary to illuminate or enhance a book visually. The upper class still preferred manuscripts but many printed books ended up with them as well. Nevertheless, book printing was the beginning of the revolution to the lower classes, and women also, who bought books on their own. Printed books were important enough to be included in inheritances and estate descriptions.⁵³ They had to be registered as possessions.⁵⁴

The collected work of Plato by Ficino is the last printed book in the Ripoli printing office in a print run of 1025 copies. Ficino considered it advisable to put the order out to tender. Possibly he was not entirely happy with the result of the printing of his edition of *Platonica theologia de immortalitate animorum* by Miscomini in 1482. Like Tedesco's edition of *De Christiana religione*, printed in 1477, it was marred by printer's errors. Domenico and Lorenzo di Alopa made a printing sample at the end of 1483. Lorenzo even went to Lucca to buy new typefaces, a Gothic typeface, because Ficino wanted his translation of Plato to be printed in 'modern' letters. The printing sample by Fra Domenico impressed Ficino and in January 1484 the contract was signed for the printing of 1025 copies of Plato's *Opera* using small modern letters. It was one of the largest projects a printer of the time had ever ventured into. It is an indication of the good reputation of the Ripoli printing house among the most erudite and influential humanists of Florence.

Ficino needed a sponsor for this project. The relationship with Lorenzo de Medici had cooled somewhat due to the close ties between Ficino and the Pazzi clan. Ficino therefore approached another wealthy Florentine merchant, Bernardo Rucellai, but he declined. The 27-year-old Filippo Valori, one of Ficino's former students, did come forward. This rich and noble family had supported Ficino before. Valori joined forces with another of Ficino's disciples, the forty-year-old Berlinghieri, also from a wealthy family. Furthermore, the contract stipulated that these two business partners would also pay the costs of the services of a proofreader to control the quality of the text and of an additional printing press. Speed was important to Ficino. The book had to appear in 1484 in connection with the occurrence of an astrological turning point in that year and the dawn of a new golden age. Fra Domenico would be paid 4 florins a piece for each quire.⁵⁵ The project was started in the beginning of 1484 and printed in two phases, probably caused by the death of Friar Domenico that year. Many records are found in the diary about visits and payments by Berlinghieri and Valori in relation to this book.⁵⁶ The total revenue for Domenico seems to have been 296 florins, of which 100 florins profit.⁵⁷ Initially, Ficino was satisfied, but

⁵⁰ Ibid, pp. 318-30.

⁵¹ Pettas, op. cit. (n. 47), p. 72.

⁵² William A. Pettas, *The Giunti of Florence Merchant Publishers of the sixteenth century* (San Francisco 1980), p. 128.

⁵³ J.R. ter Molen, A.P.E. Ruempol, A.G.A. van Dongen, *Huisraad van een molenaarsweduwe* (Rotterdam 1987), p. 68.

⁵⁴ Op. cit. (n. 18), p. 77.

⁵⁵ Op. cit. (n. 8), p. 425.

⁵⁶ Op. cit. (n. 17), pp. 104-08, 112.

⁵⁷ Op. cit. (n. 18), p. 46.

on closer inspection he was disappointed. The printing had not been carried out meticulously despite the proofreader. Ficino attributed this to the carelessness of the printers. He considered it necessary to provide the volume with a long list of errata.⁵⁸

To conclude, we also found some links in the diary with Tedesco's printing office that printed Berlinghieri's *Geography*. From May 15 until August 2, 1477, Tedesco's son Giovanni worked for the printing office of San Jacopo di Ripoli. He also sold a font to Friar Domenico in May 1477 for ten florins. From November 14 to 28, 1480 Tedesco and Friar Domenico had a partnership. The purpose as stated in the contract was to ensure that at least one press would operate each day for the work of the partnership.⁵⁹ It indicates that there was only one printing press present in each printing office. This is confirmed by another note in the diary about the purchase of a second printing press at the start of printing the *Decamerone* in 1482 as described earlier.⁶⁰ The goal was probably to provide more security for themselves as well as customers and improve their competitiveness. It was not Friar Domenico's first and only partnership with other printing offices in Florence. The reason for the termination of the contract with Tedesco is not given.

Tedesco's printing office

Niccolò Tedesco, literally the German, is the printer of the *Geography*.⁶¹ According to Skelton, he comes from the diocese of Breslau, currently Wrocław.⁶² In the book *De re aedificatoria* he introduced himself as Nicolai Laurentii Alamani. In *La Divina Commedia* Nicholo di Lorenzo della Magna was found. He should not be confused with Donnus Nicolaus Germanus.⁶³ Niccolò Tedesco seems to have arrived in Florence in the mid-1460s. Before that, he had worked as a bookseller in Silesia. Niccolò Machiavelli's father Bernardo called him Niccolò Tedesco, clergyman, and astrologer. Cleric or not, he had a son Gianni. Earlier in his career he had worked as a copyist or calligrapher, possibly connected with a scriptorium in Breslau.⁶⁴ Tedesco worked as a typesetter in 1471, in Mantua.⁶⁵ He remained active as a copyist and illuminator for Lorenzo de' Medici, among others. Two manuscripts of Ptolemy in Lorenzo's collection mention that the texts were written by Niccolò Tedesco.⁶⁶ Later, he founded his own printing house in Florence. There, he produced more than 40 Latin and Italian books between 1476 and 1486.⁶⁷ Ficino chose Tedesco to print his book *De Christiana religione*. Tedesco did not deliver the book in a professional manner. Despite his reputation as a typesetter of printed books, his inexperience was evident from the fact that he did not include a title page or colophon, nor a signature, pagination, or headers. Moreover, one of the pages was printed twice, and the printed text was riddled with typesetting errors. The letter n was even printed upside down. The surviving copies contained numerous comments and corrections between the lines, mostly by Ficino himself. Nevertheless, the publication marked the moment when one of Florence's leading intellectuals considered the time ripe to distribute his work in print. The book appeared in November 1476.⁶⁸ On September 10, 1477, Tedesco printed the first book with copper engraved illustrations integrated into the text. This was Antonio Bettini's book, *Monte Santo di Dio*. It includes three copper engravings attributed to Baccio Baldini on drawings by Botticelli. Tedesco also printed an edition of Dante Alighieri's *La Divina Commedia* in 1481, with comments by Landino. This book too contains engravings on copper plates by Baccio Baldini after drawings by Sandro Botticelli.⁶⁹ Perhaps all this explains why Berlinghieri chose him as the printer of the *Geography*, despite the mentioned shortcomings.⁷⁰ Thus, Berlinghieri's *Geography* was the third book with copper engraved

⁵⁸ Op. cit. (n. 8), p. 427-30.

⁵⁹ Op. cit. (n. 18), p. 39.

⁶⁰ Ibid, p. 60.

⁶¹ Roberto Ridolfi, 'Le ultime imprese tipografiche di Niccolò Tedesco', *La Bibliofilia*, 68 (1966), p. 144.

⁶² Op. cit. (n. 7), p. VI.

⁶³ Ibid, p. VI.

⁶⁴ Op. cit. (n. 8), pp. 327-28.

⁶⁵ Op. cit. (n. 7), p. VI.

⁶⁶ Op. cit. (n. 8), pp. 327-28.

⁶⁷ Op. cit. (n. 7), p. VI.

⁶⁸ Op. cit. (n. 8), pp. 327-28.

⁶⁹ Op. cit. (n. 1), p. 44.

⁷⁰ Op. cit. (n. 7), p. VI.

illustrations printed by Tedescho. The financial problems described earlier for, among others, the Ulm edition also applied to the Tedescho print shop. During 1483, a kind of notarized limited partnership was created with a certain "pharmacist/grocer", Antonio di Luca di Berto. This person brought in the money, 150 ducats in gold. Tedescho contributed staff, printing presses, paper expertise, and book printing. An agreement between the parties was established and signed on August 8, 1483. With the first proceeds, Tedescho should be able to pay off his debt. The profit would be distributed as follows: one third for Tedescho, two thirds for Luca di Berto. Apparently, usury is of all times.⁷¹ The work that should have been printed under this agreement, *Morali di Sancto Gregorio*, was delayed. It was started in 1483 and was intended to be completed by March 12, 1484. The colophon shows that it was not completed before June 15, 1486. The font with which the beginning of the book is printed is 111 R^a. According to incunabulists of the British Museum, this type is not found after 1483. The rest of the book seems to have been printed with font 111 R^b.⁷² No dated books from 1484 by Tedescho are known. The production of Tedescho started again in May 1485 with a book by Gilbertus de Hoylandia, *Sermones super Cantica canticorum*. The book *De re aedificatoria*, by Leon Battista Alberti has a publishing date of December 29, 1485.⁷³ After 1486, we do not find any activity of Tedescho anymore. As if he had died. If he had not died, he definitely closed his print shop. As a printer he was already a survivor. Tedescho's small enterprise must have suffered from the competition with Venetian publishing houses. They printed on smaller sized, cheaper paper, with narrow margins and small letters. Antonio Miscomini's printing house in Florence, who imitated this in a somewhat weakened form, might have been another competitor.⁷⁴

Cennini, Domenico and Tedescho all had problems selling their printed books. The same was applicable to Sweynheym and Pannartz in Rome and printers in other cities such as Milan, Venice, and Verona. Some writers even rebelled against the art of printing. The poet and scholar Angelo Poliziano, also the librarian of Lorenzo de Medici and tutor to his children, said: "now, in the blink of an eye, the stupidest ideas can be recorded in a thousand volumes at once and disseminated everywhere". A comparable opinion is held today regarding social media. Other objections to the printing press concerned the spreading of knowledge among people for whom it would be better if they did not know about it and the envy of manuscript copyists.⁷⁵ Printers worked with scholars as correctors to prevent errors in their books. Sweynheym and Pannartz for example were assisted by Cardinal Bussi. He was a great supporter of printing, for if it had existed in the time of the ancient Greeks and Romans, the monuments of the ancient philosophers would never have been lost.

The literature concerning the *Geography* up till now

The *Geography* by Francesco Berlinghieri is a version of Ptolemy's *Geographia* in vernacular language accompanied by 31 engraved maps.⁷⁶ Together with the Ulm edition of 1482, it is the first edition where modern maps have been added to the 27 classical maps (the so-called A-group). The *Geography* contains the earliest printed modern maps of Spain, France, Italy, and Palestine. In Florence, many manuscripts of the *Cosmographia* were produced during the fifteenth century. In contrast, Berlinghieri's *Geography* is the only printed Ptolemy edition ever in Florence.⁷⁷ It contains various formal innovations intended to make the work easier to consult. The maps are distributed in groups throughout the text, close to the passages that deal with the specific regions. The place names with coordinates are given in alphabetical order at the end of each book, or so-called liber, in front of the group of maps in which they appear.⁷⁸ Berlinghieri dedicated his *Geography* to Federico da Montefeltro, Duke

⁷¹ Ridolfi, op. cit. (n. 61), p. 145-46.

⁷² Ibid, p. 148.

⁷³ Ibid, p. 150.

⁷⁴ Ibid, p. 151.

⁷⁵ Op. cit. (n. 8), p. 311; In the Ottoman Empire this was different. Arabic was the holy language of the Koran and therefore Ottoman authorities had forbidden mechanical reproduction of it. The first printing press in Aleppo dates from 1706, in Istanbul from 1728, p. 314.

⁷⁶ In this book we will use the words *Cosmographia* and *Geographia* for manuscripts and *Cosmography* and *Geography* for printed copies.

⁷⁷ Op. cit. (n. 7), p. V.

⁷⁸ Op. cit. (n. 21), p. 322.

of Urbino, founder of the great Urbinate library. Some high-ranking people preferred manuscripts to books. Federico was one of them. According to a frequently cited quote by Vespasiano da Bisticci, a bookseller in Florence in those days, he would feel ashamed of owning a printed book.⁷⁹ Besides being a scholar and humanist, Federico also was a successful mercenary general who made fortunes leading his armies into battle on behalf of the frequently warring rulers of neighbouring Italian states. Berlinghieri's *Geography* was the largest engraving project in Renaissance Florence. It is interesting to note that Florence is the only name in capital letters in the entire text of the *Geography*.⁸⁰ Berlinghieri must have had a high opinion of his hometown.

The text

According to a passage in the *Geography*, Berlinghieri started writing the text in his fifth lustrum, thus before 1465. It was written in *terza rima*, like Dante's poems, possibly under the influence of Landino. Gregorio Dati's *La Sfera* from 1435 may also have served as an example. This is a metrically written *Cosmographia*, but in *ottava rima*.⁸¹ Almagià considers the quality of the poems by Berlinghieri to be mediocre.⁸² He suggests that Liber Tertius was written after 1471. In this Liber, Berlinghieri writes about Pope Sixtus. Sixtus IV was elected Pope on August 9, 1471. Liber Primus up to and including Liber Quartus and a part of Liber Quintus might have been composed before 1478. This is derived from four quotations from the *Geography*. They were used during the protest at the *Signoria* on January 15, 1478. One is present in chapter four of Liber Quintus. Another can be found in Liber Secundus (Sito di Gallia Belgica). The last two are present in the chapters eleven and thirteen of Liber Tertius.⁸³ In a letter to Bartolomeo della Scala, Berlinghieri wrote that he intended to visit Conrad Swaynheym in Rome. The letter is dated September 10, 1476. Therefore, according to Almagià, Berlinghieri should have been close to completing his book by then. The last two Libers, Sextus and Septimus, which complete the work, would have been added in haste at the end of 1478 and the beginning of 1479. Berlinghieri apologized several times for the conciseness of this text, for example in chapter six of Liber Sextus. The reason for this could have been a diplomatic mission. He was sent to the court of Gonzaga in Mantua later that year, as a speaker and representative of the Medici.⁸⁴ Liber Primus and the last chapters of Liber Septimus were directly derived from the text of Ptolemy. They were converted by Berlinghieri into Italian verse. Liber Primus starts with a poem with praise for geography. It is announced that Berlinghieri will have Ptolemy as his guide in his imaginary journey through the known world. In the remainder of the poem the world is described. The world is divided into regions in the order conceived by Ptolemy. Largely classical sources have been used for the text. These include most importantly Ptolemy, Pliny, Strabo, and Pomponius Mela. However, data from modern authors such as Cristoforo Buondelmonti and Flavio Biondo were also incorporated. Furthermore, information from more recent and portolan maps was processed. Almagià described this extensively in his detailed study of the text.⁸⁵ Berlinghieri usually starts with general information about the names of the regions, the astronomical situation, the borders, and so on. Next, he mentions the maritime places, the mountains, the rivers, and the places in the interior. He often appoints tribes and people. On numerous occasions Berlinghieri launches into historical, mythological, or ethnological digressions. Finally, he mentions the islands around the region in question.⁸⁶ Liber Quintus treats the Holy Land, the biblical history and hagiography. In this liber Ptolemy says to Berlinghieri: look from above at the curved earth! This implies it was already known that the earth was not flat but round. The old Palestine is described in Liber Septimus. More orographical details, about what is on the map and what can be found, are presented. These were described more extensively in the *Geography* than in the *Cosmography*.⁸⁷

⁷⁹ Op. cit. (n. 7), p. V.

⁸⁰ Roberts, op. cit. (n. 14), p. 267.

⁸¹ Op. cit. (n. 7), p. V.

⁸² Ibid, p. V.

⁸³ Op. cit. (n. 3), p. 224.

⁸⁴ Ibid, pp. 224-25.

⁸⁵ Ibid, pp. 230-32.

⁸⁶ Op. cit. (n. 3), pp. 228-29; op. cit. (n. 21), p. 323.

⁸⁷ Op. cit. (n. 4), pp. 27, 88.

The geographical names are classic Ptolemaic. For the European regions, and less often for the Mediterranean regions of Asia and Africa, Berlinghieri introduced modern names. Occasionally, they are interspersed with the old ones. Very often Berlinghieri applied the modern notation of classical names for the most important places. This work of comparison and identification of old names and the conversion to modern names is one of the original elements of Berlinghieri's work. He mentioned it only once, in casual terms, in chapter fourteen of *Liber Tertius*.⁸⁸ Nautical maps were the main source for this nomenclature. Berlinghieri incorporated Ptolemaic information in the descriptive parts of his poem. This information was generally derived more from the maps than from the text of the *Cosmographia*. In addition, Berlinghieri made use of certain regional, mainly chorographical, maps for names and other data in his text. These sources included a now lost map of the British Isles. The well-known map of Northern Europe by Claudius Clavus was also used. However, this must have been a different version of the map than the ones known.⁸⁹ The use of portolans as an important source is generally demonstrated by the following facts. The modern names are in most cases the names that can be read on nautical maps of the fifteenth century. The correspondence between ancient and modern names was drawn only for the area covered by these portolans. It was therefore limited to the coasts. For the areas beyond, - extra-Mediterranean Africa, Central and East Asia - the correspondence is completely lacking, except for a few cases. Berlinghieri's approach to linking old and modern names has led to errors and misunderstandings. Almagià discusses numerous examples in the printed text.⁹⁰ He also adds examples between the printed text and the text of each of both manuscripts and vice versa. The same applies to the printed maps and the maps present in the manuscripts of Berlinghieri's *Geographia*.⁹¹ Dalché described that multiple sources served as an example.⁹² In addition, in the introduction is already pointed out that various parts of the *Cosmographia* were translated at different moments.

The maps

According to Skelton, the maps of Berlinghieri's *Geography* differ from the other atlases printed in the fifteenth century in the way they were composed. Their content is different as well. Each of the 26 regional maps was designed according to Marinus' plane projection with equidistant meridians and parallels. Therefore, the regional maps have rectangular borders. This is unlike all other early printed editions of Ptolemy's *Cosmography* which contain regional maps with trapezoidal borders. The homeotheric projection, according to the third revision by Nicolaus Germanus, was only applied to the world map.⁹³ The maps are neither in design, nor in sharpness of engraving and printing comparable to those of the Rome editions of the *Cosmography*. They show many errors, in most cases attributable to the engravers. Sometimes the inconsistencies are based on Berlinghieri's text. Many, but not all, errors in toponyms or outline have been corrected on the copper plates. According to Almagià, there is not one copper plate without visible corrections.⁹⁴ Already existing modern maps of France and Italy must have been a source of information for Berlinghieri's *Geography*. However, these are distinctively different from those present in the printed and manuscript versions of the *Geographia*. The modern maps in the *Geography* were, as the 26 regional maps, designed according to the plane projection. Those of Italy and Spain were the subject of more extensive study by Almagià.⁹⁵ A map of biblical-Christian origin has been chosen as example for the map of modern Palestine and the Holy Land in the printed version and the Braidense manuscript. According to Almagià, the modern maps do not belong to the book. He deduces this from the many discrepancies with the content of the text. In contrast to the classical maps, the modern maps have neither graduation nor scale. They are derived from portolans. Longitude and latitude degrees do not exist on this type of maps. Berlinghieri himself seems not to have been responsible for the

⁸⁸ Ibid, pp. 228-29.

⁸⁹ Ibid, p. 252.

⁹⁰ Ibid, p. 252.

⁹¹ Ibid, pp. 252-53.

⁹² Op. cit. (n. 21), p. 323.

⁹³ Tony Campbell, *The earliest printed maps*, (London 1987), pp. 74-7, 124-27, 133-35; Op. cit. (n. 7), p. 11.

⁹⁴ Op. cit. (n. 3), pp. 217-18.

⁹⁵ Roberto Almagià, 'The first modern map of Spain', *Imago Mundi*, 5 (1947), pp. 27-31; Roberto Almagià, *Monumenta Italiae cartographica* (Firenze 1929). As cited in Skelton, op. cit. (n. 7), p. 11.

design and execution of these four modern maps, nor for those of the 27 classic maps.⁹⁶ The four modern maps in the Vatican manuscript all differ from those in the printed version of Berlinghieri and the Braidense manuscript. The one of Palestine in the Vatican manuscript follows that of the fourteenth century model of Marino Sanudo's *Liber secretorum fidelium Crucis*, from about 1320. It is very different compared to the one in Berlinghieri's printed edition. This applies to the coastal contour, but also to many details of orography and hydrography, for example the contour of the lakes. The modern map of Palestine in the Braidense manuscript is again very similar to the one present in the printed edition.⁹⁷ The modern maps of Spain, France, and Italy in Berlinghieri's Vatican manuscript also have a distinctly different character compared to those in the printed version of Berlinghieri, as well as the Braidense manuscript.⁹⁸ However, this is based on another applied projection which can also be found in the Ulm edition of 1482. The draftsman of the maps of the Vatican manuscript probably obtained the three modern maps and the one from Palestine from a manuscript according to the third revision by Nicolaus Germanus. Almagià states that the Vatican manuscript is older than the Braidense manuscript. Later, the same author, or one from the same school of miniaturists, must have carried out the Braidense manuscript. He must have used the modern maps of the Laurenziana, or another very similar, manuscript as example.⁹⁹ The maps accompanying Berlinghieri's work were created independently from the text, from the point of view of their origin and execution. Almagià concluded that Berlinghieri clearly was not a cartographer. His geographical knowledge seems to have been very limited.¹⁰⁰ Lago suggests



Fig. 41



Fig. 42

Berlinghieri must have used a cartographic base bought from a workshop of copyists and cartographers in Florence.¹⁰¹ Although the toponyms were Italianized, there is no correspondence between the text and the content of the maps. The toponyms on the maps were translated, but not correctly. Fischer concludes that the two known manuscripts by Berlinghieri were not used as example for the engraver of the *Geography*.¹⁰² Fischer suggested, like Almagià, that it must have been a manuscript of a type represented by the maps in the Braidense manuscript and those of a manuscript in Florence.¹⁰³ To visualize the above, figure 41 to 44, from left to right, show the classic maps of Spain followed by the modern maps of France,

⁹⁶ Op. cit. (n. 3), pp. 252-53.

⁹⁷ Op. cit. (n. 1), p. 38.

⁹⁸ Joseph S.J. Fischer, *Claudii Ptolemaei Geographicae Codex Urbinas Graecus* 82 (Leiden 1932), pp. 375-98.

⁹⁹ Op. cit. (n. 3), pp. 250-51; Biblioteca Medicea Laurenziana, shelfmark Plut. 30.1, about 1480; the manuscript can be consulted digitally: <http://mss.bmlonline.it/?&search=plut.30.1>; Biblioteca Medicea Laurenziana, shelfmark Plut. 30.2, about 1455-1462; the manuscript can be consulted digitally: <http://mss.bmlonline.it/?&search=plut.30.2>; Biblioteca Medicea Laurenziana, shelfmark Plut. 30.3, about 1466-1468; the manuscript can be consulted digitally: <http://mss.bmlonline.it/?&search=plut.30.3>; Biblioteca Medicea Laurenziana, shelfmark Plut. 30.4, about 1468-1471; the manuscript can be consulted digitally: <http://mss.bmlonline.it/?&search=plut.30.4>

¹⁰⁰ Op. cit. (n. 3), pp. 252-53.

¹⁰¹ Op. cit. (n. 1), p. 28.

¹⁰² Fischer, op. cit. (n. 98), pp. 375-98.

¹⁰³ Biblioteca Medicea Laurenziana, shelfmark Plut. 30.1, about 1480; the manuscript can be consulted digitally: <http://mss.bmlonline.it/?&search=plut.30.1>; Op. cit. (n. 3), pp. 250-51.

in the following sequence: Braidense manuscript, and a printed and coloured map. The corresponding maps of the Vatican manuscript are not shown here but can be viewed on the website of the Vatican library.¹⁰⁴ It clearly shows that the modern map of France from the Vatican manuscript was derived from a different source, in contrast to the classic maps of Spain which are all quite identical (Fig. 41-4).

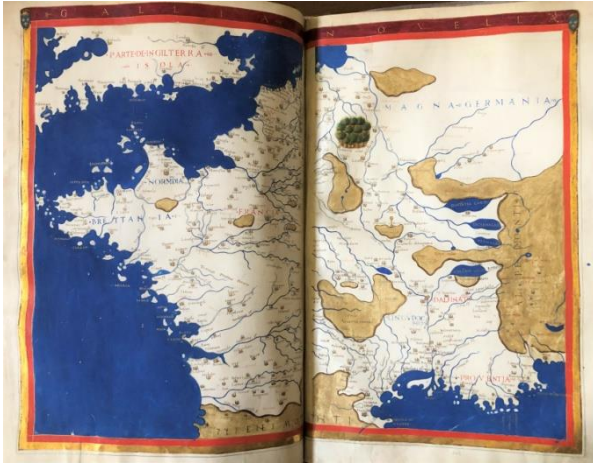


Fig. 43



Fig. 44

Dedication

The *Geography* is dedicated to Federico d'Urbino, the ruler of Urbino by succession, a city-state of 7000 inhabitants.¹⁰⁵ He was born in 1422 as the illegitimate son of Guidantonio da Montefeltro, Count of Urbino and acknowledged as a son because 25 years of marriage had not produced a legal successor. When he remarried after the death of his first wife, a legitimate son called Oddantonio was born from this second marriage in 1427. Federico was then relegated to second place. He joined the warlord Niccolò Piccinino at the age of 15 and proved to be a brilliant warrior, capturing a fortress deemed impregnable from the formidable Sigismondo Malatesta. The legitimate son Oddantonio was found dead in the streets in 1444 with his cut off penis between his teeth after making himself unpopular with tax increases and unruly sexual behaviour. Federico took the reins and managed to make himself popular and the city prosperous thanks to the huge sums he earned as Italy's most wanted mercenary. In 1450, he had bad luck when the lance of his opponent in a tournament in Milan broke his nose and put out his right eye. Federico cultivated his image of a ruler, a warrior and, above all, a reader. He immersed himself in philosophy, astrology, history, warfare, and theology and collected manuscripts since 1460. After a new wing was added to his palace in 1465, the idea occurred to him to start a real library, the most beautiful and the largest since antiquity. Vespasiano da Bisticci and his team of 40 copyists, rubricators, and illuminators, would be busy for almost a decade. Federico had a low opinion of printed books. They had no place among his beloved manuscripts but were kept in a separate room.

In 1467, Federico was in Florence's service to stop an army led by the feared Venetian commander Bartolomeo Colleoni who, with a group of Florentine exiles, was determined to depose the Medici. Lorenzo de Medici hired his godfather Federico d'Urbino again to solve a dispute over alum mines with the people of Volterra in 1472. He freed up a million florins for Federico's army of 12 000

¹⁰⁴ https://digi.vatlib.it/view/MSS_Urb.lat.273; The modern map of France in the Vatican manuscript is very much alike the modern map of France in the Ulm editions.

¹⁰⁵ There is a connection between Middelburg, where we live, and Federico d'Urbino to whom the *Geography* is dedicated. A certain Paulus Adriani de Middelburch studied medicine at the University of Padua and taught theology and dialectics in Middelburg after his return. Somewhat later, he left for Leuven to teach at the university there. He was approached by the Signoria of Venice for a position at the University of Padua as lecturer in astrology. In 1479, Paulus travelled to Abruzzo and visited Urbino on his way back to Padua. There he was received by Federico da Montefeltro, which resulted in him becoming his personal physician and astrologer; Gilbert de Smet, *Nationaal biografisch woordenboek* (Brussel 1964-2020); Paulus also corresponded with Marsilio Ficino and became friends with Copernicus. Based on the astronomical calculations of Paulus and Copernicus, the church decided to replace the Julian calendar with the Gregorian one; Rob Meens, Carine van Rhijn, *Cultuureschiedenis van de middeleeuwen* (Zwolle 2015).

men to attack Volterra. The city was looted, hundreds of inhabitants were killed, and Federico appropriated several manuscripts for his library. In 1476, relations between Pope Sixtus and the Medici grew worse. It led to the Pazzi conspiracy and the excommunication of Lorenzo. Lorenzo's opponents were supported militarily by Federico d'Urbino, formerly in service with Lorenzo. The Florentine forces were in 1478 commanded by Ercole d'Este, Duke of Ferrara. The Florentines received reinforcements from Venice and Milan under the command of a mercenary from Rimini, the thirty-seven-year-old captain Roberto Malatesta, son of Sigismondo. At the beginning of the war, he had fought for the opponents, but after a disagreement he now offered his services to Florence. At the end of 1479, things were not looking good in Florence. Ercole d'Este had lost to Duke Alfonso of Naples while Federico d'Urbino and the French king's mediation with the pope had failed. Vespasiano da Bisticci was sent on a diplomatic mission by Lorenzo de Medici to Alfonso and indirectly to Federico. The latter, meanwhile, had been injured by the collapse of the balcony of his palace. Since then, he could no longer walk or ride a horse and was carried around in a sedan chair. Vespasiano's mission was successful. Duke Alfonso was favourable to Lorenzo and a peace treaty with King Ferrante of Naples was concluded. In 1480, Sultan Mehmed II occupied Otranto and prepared for an attack on Rome. The pope mobilised forces against the Turks and reconciled with Lorenzo. In the summer of 1482, Federico started his last war, the Guerra del sale. He had to choose on whose side he would fight. This time he chose Duke Ercole d'Este of Ferrara, possibly because of the exceptional sum of 165 000 florins offered to him and fought against the Venetians and the pope. It once more shows the carefree moral attitude typical of all the above-mentioned mercenaries. Federico's health had already deteriorated due to the fall from the balcony, and he had now also become obese. During the battle in the mosquito-infested lowlands of the Po River delta, many soldiers fell ill and died of fever. According to Vespasiano, Federico died of swamp fever on September 10, 1482.¹⁰⁶

Berlinghieri dedicated the *Geography* to Federico because of his services to Florence. The first 3 folios of the *Geography* are the only text pages related to this dedication of the *Geography* to Federico of Urbino. Skelton considers this as significant. The devotion is found in the title (fol. 1^v), the verse dedication (fol. 2^v), the heading of Liber Primus (fol. 3^r) and in Ficino's letter (fol. 3^v). In this part of the book, a different font was used. He further theorizes that it indicates that Berlinghieri initially wanted to dedicate the book to another person.¹⁰⁷ It could also imply that he decided on the dedication later, when the book was almost finished. Otherwise, allusions to the dedicatee would probably have been found throughout the text. The apologue, written by Ficino, includes the appointment of the Duke of Urbino as general in the battle against Venice and the pope on April 17, 1482. This letter is included in a printed version of the letters by Ficino.¹⁰⁸ The letter is chronologically arranged between one dated February 6, 1481, and another dated March 9, 1482.¹⁰⁹ It was probably written between April 17 and May 9, 1482.¹¹⁰ We believe that the dedication to Federico is related to the abovementioned events between 1480 and 1482.

¹⁰⁶ Op. cit. (n. 8), pp. 412-13.

¹⁰⁷ Op. cit. (n. 7), p. VII.

¹⁰⁸ Ibid, pp. VI, VII.

¹⁰⁹ Op. cit. (n. 3), p. 225.

¹¹⁰ Op. cit. (n. 7), p. VII.

CHAPTER 4

Paper and watermarks in Tedescho's printing office from 1477 to 1486

Introduction

The printing of incunabula was greatly stimulated by the increasing production of paper. Without paper, the invention of book printing would not have had such an impact. Before we present our findings on the watermarks, we first want to provide some basic information about the history of paper production and watermarks. Paper is usually said to have been developed about A.D. 105 in China by Tsai Lun.¹ It was produced out of rags and plant fibers.² The Arabic World learned papermaking in 751 from Chinese prisoners in Samarkand. Paper was later noted in Baghdad and elsewhere in the Middle East.³ By the thirteenth century, the art of papermaking first reached Spain and later Italy from the Arabic world.⁴ Papermakers in for instance Fabriano in the Marche region in Italy perfected the use of water powered mallets for the trituration of materials, as well as wire fashioned moulds for forming the individual leaves, and gelatin to improve the writability of the paper. Around 1280, their paper bore the characteristic pattern of chain and water lines and watermarks. Paper made on such a mould is called laid paper which prevailed until about 1756.⁵ Thereafter, wove paper made on a mould with a finely woven wire mesh was invented by the English papermaker James Whatman.⁶ The basic materials remained stout hempen, cordage, and clean linen rags, as already in use by the papermakers of Samarkand and Damascus.

Paper in Italy

In its early days, paper was almost as expensive as parchment. Rags, the prime commodity for making paper, were common enough to make a comparatively cheap writing surface possible.⁷ With urbanisation, people started wearing more undergarments made of flax and hemp-based linen, the raw material for paper.⁸ At the beginning of the fourteenth century, Fabriano was exporting its products into the rest of Europe.⁹ By the end of that century, paper could be bought for one sixth the price of parchment or vellum. The prejudice of the church against an originally Islamic product and the law against it, because of its impermanent character, slowed the acceptance of pliable, serviceable, white paper down for a long time.¹⁰ Nevertheless, by the first half of the fifteenth century, the dominance of paper was assured. When printing by movable types was still in a process of development, papermaking had already long-established procedures and customs. The invention of printing can be viewed as a logic result of the trade and production of paper.¹¹

¹ Stephen Spector, 'Introduction', *Essays in Paper Analysis*, (Cranbury 1987), p. 8.

² Peter Rückert, Sandra Hodecek, Emanuel Wenger, *Bull's head and Mermaid, The History of Paper and Watermarks from the Middle Ages to the Modern Period* (Stuttgart 2006), p. 12.

³ Spector, op. cit. (n. 1), p. 8.

⁴ Theo Laurentius, Frans Laurentius, *Vijftig historische watermerken*, (Middelburg 2013), p. III; Ross King, *The bookseller of Florence* (Amsterdam 2021), pp. 180-2; In 1280, eight paper mills were already operating in Fabriano. In the fourteenth century, the town was already producing one million sheets per year, p. 182.

⁵ Op. cit. (n. 1), p. 8.

⁶ Ibid, p. 8.

⁷ Giancarlo Castagnari, *L'opera dei fratelli Zonghi* (Fabriano 2003), pp. 316-7.

⁸ King, op. cit. (n. 4), p. 182.

⁹ Castagnari, op. cit. (n. 7), pp. 28, 268, 314, 352. Rückert, op. cit. (n. 2), pp. 14-15.

¹⁰ Allan Stevenson, *The problem of the Missale Speciale* (London 1967), p. 49. Conversely, some Korans were written on paper that had a cross and other Christian symbols as watermark. This led in 1409 to a fatwa against the use of European paper; King, op. cit. (n. 4), p. 182.

¹¹ Laurentius, op. cit. (n. 4), p. III.

Paper demand

In the fourteenth century, two thirds of the manuscripts were written on parchment and one third on paper. In the fifteenth century almost five million manuscripts were produced. Only 28% was written on parchment and 72% on paper. Due to the plague pandemic, a huge surplus of clothes became available. Another side effect of the plague was that it killed many cattle, being the main providers of parchment. Both phenomena contributed to the transition from parchment to paper in the decades following the Black Death. Paper also became cheaper at about one sixth of the price of parchment and printing a book was significantly less expensive than writing it on parchment by a copyist.¹² Around 1450, there were still relatively few paper mills. The slow but unremitting increase in the use of paper for printing and writing induced a steady growth in the demands on operating paper mills and a rise in the number of paper mills all over Europe. On average, a mill was unlikely to accumulate a large stock. Probably, the papermaker could not afford it at a time in which the price of one or two quires of common paper was still greater than an ordinary man's daily wage.¹³ The method of multiplying books by printing grew into an industry. More paper mills were built to supply the necessary paper, and new vats were added to old mills. A yet greater demand for paper was to come. There are indications that a papermaker in the mid or late fifteenth century was able to sell all he could produce. He took orders for delivery up to months or even a year ahead. A paper buyer, like a printer or *cartolaio*, had to plan the purchase of paper in advance. Stevenson's study of Norman mills shows that in the sixteenth and seventeenth centuries, an ordinary mill (a small family business with a single vat) commonly allowed the reams to stack up through for instance the winter or at other times for a month or so. They then sold the supply on hand to a factor or paper merchant.¹⁴

Paper trade and use

Paper sellers had existed since the early days of Fabriano, conveying paper to near and distant destinations, as well as overseas. The paper export made Fabriano famous. The markets showed great interest in paper of Fabriano quality.¹⁵ The side effect was that the number of paper mills increased so quickly that the competition became too great. Many papermakers were forced to migrate to avert bankruptcy from the fierce competition, comparable to what happened with early printers. A lack of raw materials may also have been a factor of importance with respect to this migration. Sales of paper were frequently made directly from mill to printer, especially when they were active in the same region. Already in 1450, a printer had to place orders for the necessary paper in advance to obtain sufficiently homogenous material to print a complete edition of a book. There was also a seasonal preference amongst printers. Paper from the spring seems to have been the best.¹⁶ The clearer the water, the better and more beautiful the paper became.¹⁷

A printer did not stock his paper long before he used it on the press because it was an expensive commodity. As a rule, a specific amount of paper was obtained and set out for a particular job.¹⁸ When a specific run of paper is found in a book, the paper will have been procured intentionally for the printing of that book. Ordinary, such stocks of paper were secured directly or ultimately within one, two, or three years after manufacture, depending on factors such as warehousing and distance.¹⁹ In the period from about 1360 to 1630/50, paper of normal quality was used within three to four years according to Piccard.²⁰ As a consequence, comparable watermarks will be found regularly in the paper of a book.

¹² King, op. cit. (n. 4), p. 183.

¹³ Stevenson, op. cit. (n. 10), p. 49.

¹⁴ Ibid, pp. 53-4.

¹⁵ Op. cit. (n. 2), pp. 14-16.

¹⁶ Maurits Sabbe, *De meesters van de Gulden Passer* (Rotterdam 1978), p. 140.

¹⁷ King, op. cit. (n. 4), p. 182.

¹⁸ See the contract between Tedesco and a grocer for the mutual participation in a book in Roberto Ridolfi, 'Le ultime imprese tipografiche di Niccolò Tedesco', *La Bibliofilia*, 68 (1966), pp. 143-52, p. 145; Several examples are present in Melissa Conway, *The diary of the printing press of San Jacopo di Ripoli 1476-1484* (Firenze 1999), pp. 25-6, 28.

¹⁹ Op. cit. (n. 10), pp. 94-6.

²⁰ Op. cit. (n. 2), p. 35.

Paper production

Paper moulds

Paper manufacturers used moulds for papermaking. These were constructed by a wooden frame on which a mat of woven copper wires was attached.²¹ The mat consisted of fine laid wires as well as chain wires which were heavier, more widely spaced, and crossing them perpendicularly. In ancient times, this mat was made from woven cloth and later bamboo strips.²² This mould was dipped in a vat with water and paperfibres. By lifting it, the water ran through the mat leaving a layer of fibres or pulp. Next, the vatman passed his mould over to the coucher, who then transferred the sheet of pulp on a piece of felt. Meanwhile, the vatman dipped a new sheet with another mould. Together they formed a stack of sheets of felt and paper, which was put under heavy pressure, to remove as much water as possible. After this, the sheets of paper were hung on a rope in large drying sheds. When dried, a process of sizing with gelatin could be applied to enhance the writability. The vatman and coucher normally used two moulds per dipping vat for reasons of efficiency. These are called twin moulds.²³

Loeber, in his book on moulds, merely indicates that a practiced team of papermakers could produce 1500-2500 sheets of paper in 10-12 hours. He further mentions that mills often had many moulds and even a separate room where the mouldmaker made repairs and new copper gauze. This suggests a rather short life span of a mould.²⁴ This is plausible as paper moulds took quite a beating during use. The vat with water and paperfibres contained the oxidising and corrosive alum. The addition of this agent prevents the development of mould and ensures better adhesion of the fibres in the paper. But it is not favourable to the material the papermould is made of. Tschudin estimated that a mould had a work life of maximum two years. Larger moulds were considered even more delicate.

Paper ripening and sizing

Already early in the papermaking process, it was acknowledged a good thing to allow paper to dry for a few months before leaving the mill. This period presumably varied with the quality of the product and the demand of the purchasers. Several reams of paper purchased together might include paper that had seasoned a longer or shorter time than the rest. In more modern times, the custom was regularized. At the Whatman-Balston mills in Maidstone during the late eighteenth and early nineteenth century, ripening took place after the paper had been sized and re-dried in the loft for about two days. After drying, the leaves were re-stacked until the consolidation of their fibers was complete. That might be for as long as six months for the strongest paper.²⁵ As the paper industry cherished its traditions, periods of ripening will have occurred in the fifteenth century too. In this century, two basic sizes, small paper forma minor and large paper forma major (double the size), were generally used. The smaller format represents about ninety percent of all paper used at the time.²⁶ From the sixteenth century onward, an ever-increasing production of printed matter and greater variety of sizes developed.²⁷ Sizes of paper and the names for each size varied according to the country and period.²⁸ The approximate sizes and names for the paper used during the renaissance are: imperial 70 x 50 cm, royal 61 x 44 cm, median 51 x 34 cm, and small 45 x 31 cm.²⁹ Paper was stored and traded in the form of a ream which contained

²¹ Op. cit. (n. 4), p. VI-VII.

²² Op. cit. (n. 1), p. 8.

²³ Ibid, pp. 12-3; Stevenson describes ten points of possible differences to differentiate between twins.

²⁴ Edo G. Loeber, *Papermould and mould maker* (Amsterdam 1982), pp. 8-9 and 10-12; Op. cit. (n. 7), pp. 359-60.

²⁵ Op. cit. (n. 10), p. 53.

²⁶ Ibid, p. 52; Conway, op. cit. (n. 18), pp. 26-8, 327-31; Emilia Nesi, *Il diario della stamperia di Ripoli* (Firenze 1903), p. 59.

²⁷ Only in the nineteenth century some form of standardization in sizes developed. Labarre provides an appendix with the many different denominations of sizes; Emile Labarre, *Dictionary and Encyclopaedia of paper and papermaking* (Amsterdam 1952), pp. 246-72.

²⁸ Labarre, op. cit. (n. 27), p. 249, where a fifteenth century stone slab from Bologna is described with the four standard sizes.

²⁹ David Woodward, 'Chapter 22 Techniques of map engraving, printing and coloring in the European Renaissance', *The History of Cartography Volume three* (Chicago 2007), p. 597.

480-500 leaves of paper. In a ream there may be eight or more sorts of "nearly identical" watermarks present.³⁰

Watermarks

Makers of ancient oriental paper did not use watermarks, perhaps partly because bamboo was unsuitable for the addition of designs. Though metal wires were used in making paper in twelfth-century Spain, no watermarks seem to have been applied in Europe till more than a century later in Italy. They were introduced by the papermakers of Fabriano.³¹ By the fifteenth century, most paper was watermarked. It is not clear why they came to be called watermarks. In the sixteenth and seventeenth centuries, countermarks gained currency.³² The watermarks in the paper are the result of a figure made out of copper wire which was sewn onto the copper wires of the mould used to make the paper. When paper first began to be produced, watermarks were made by the papermakers themselves. Later they were produced by specialised craftsmen, often gold or silversmiths.³³ The designs were automatically impressed into the paper during the manufacturing process, as well as the copper wires themselves. If one looks at a sheet of paper against a light, the watermark can be seen very clearly because of a difference in the paper's thickness.³⁴ The impressions of the copper wires in the paper are called the vergure and consist of horizontal chain lines and vertical laid lines. Although the original purpose for the use of watermarks is unclear, they were applied by paper manufacturers as a kind of trademark for themselves and their mills or for the region of production.³⁵ Since paper from Fabriano was of a high standard it became more popular. Its watermarks became not only a sign of origin, but also a mark of quality. The papermakers were required to incorporate watermarks by traders in order to guard against forgery.³⁶ There is a great variety in motives: unicorns, dogs, sirens, letters, numbers, flowers, bells, circles, keys, and armorials amongst others. Watermarks, if proven popular, remained in use in a wide variety for many years.³⁷

Some watermarks may look identical at first sight, but as the moulds were handmade, subtle differences can be distinguished. It was impossible for the mould maker to fashion two, four, or eight *filigranes* precisely identical and then sew them to similar moulds in exactly the same manner. Simple watermarks could be formed by hand or perhaps with a pair of pliers. Another way was to burn the design into a block of wood and then to fashion wire forms into the burnt grooves. This resulted in watermarks that were very similar but never quite identical. Identical watermarks are only possible if they are made from the same mould; all others are comparable or nearly identical. Even the two members of a pair invariably differ in some detail of design, curve, or measurement, as well as in the manner and position in which their wires were sewn to the mould.³⁸ With the later and far more intricate designs from the sixteenth and seventeenth centuries, it would prove to be impossible to create identical watermarks. In larger paper mills where, for example, four dipping vats were used, we can find at least eight different patterns of what appears to be the same watermark. Therefore, we can make the following distinction: two sheets from the same mould are called identical, two sheets from two different moulds with the same watermark are called nearly identical. The same type of mark is called closely related.

Small differences in size of the same watermark in another leaf of paper are not uncommon. This may have developed as the paper was put under pressure and hung on ropes exposed to light and variations in temperature to dry. The only variation recognizable within the same paper results from imperfect forming or couching of the leaf, or from deterioration of the mould and mark, which is recognizable by shifts in the position of the watermarks and chains and re-sewing them to the mould. Cleaning the mould can also lead to small deformations, wire breakage, and loosening from a part or the

³⁰ Laurentius, op. cit. (n. 20), p. XIII.

³¹ Op. cit. (n. 2), p. 15.

³² Op. cit. (n. 1), pp. 9-10.

³³ Op. cit. (n. 2), p. 14.

³⁴ Ibid, p. 15.

³⁵ Ibid, p. 15; Op. cit. (n. 20), p. X.

³⁶ Op. cit. (n. 2), p. 15.

³⁷ Op. cit. (n. 20), p. 12.

³⁸ Op. cit. (n. 10), p. 61.

complete watermark. These may be distinguished as variant states of the mould or mark and as wrenched or blurred impressions. A watermark may be re-tied partly or completely. This can be determined by looking at the number and position of the knots used to fasten the image to the mat. Some may have been replaced or attached to a different laid line or chain line while others stay the same. This element shows the history of the use of the mould. According to Stevenson, in cases of distortion or movement of the watermark, the individual pattern of knots is crucial to determine whether the watermark is the same or not.³⁹ In the period of the incunabula, the sewing wire was relatively coarse. Therefore, this will show as ticks or dots in the paper structure in the place where it was applied.

The use of watermarks for assessing date, origin and chronology

Old documents and books can be authenticated by an examination of the watermarks in the paper. They can provide even more precise means for dating a document or artefact. Sometimes in accordance with, but also in contradiction to a declaration of date by the printer, artist, or author. They can also help to determine the date or place of origin.⁴⁰ Watermarks provide a basis for the identification of batches of paper stock as fingerprints, DNA evidence, and retinal scans do for human beings.⁴¹ The date of a stock of paper, produced from a pair of moulds, can be constrained to a narrow time span, as the moulds and the watermarks attached to them deteriorate rapidly. Although some remnant batches of paper might survive unused for a certain period of time, the bulk of a batch of paper was consumed fairly quickly by printers and scribes. One could not afford to warehouse a large inventory of paper.

Stevenson addressed the question of the time span between paper fabrication and use. He contended that paper in a large size or high quality might last over a period of years and wrote that paper was used within one to three years after it was produced.⁴² Piccard described that paper was consumed within three to four years.⁴³ As already mentioned, Tschudin described a maximum work life of a mould of two years.⁴⁴ Perhaps one or two years may be added for the ripening of the last produced paper and the transport, trading, and distribution of it. Then, the book had to be printed and published, which in most cases could take up to a year. The printing of books with a high number of pages in a large print run could take even more than a year. From this can be deduced that paper was produced and used up within 3-6 years. This corresponds with our findings about the paper used in Tedescho's and the contemporary San Jacopo di Ripoli printing offices.⁴⁵ The statement relates to regularly present watermarks in the bulk of the paper used for a book.

The discovery of a watermark very similar to one which a scholar, bookseller or archivist is trying to date, will generally prove to be helpful. The comparison with dated, identical marks provides a precise and objective dating method. Many undated books, manuscripts, and letters could be dated quite precisely on such grounds if the means for doing so were made more widely available. Greg was able to prove that several Shakespearian quartos that bore three publication dates, 1600, 1608, and 1619 were all printed in 1619.⁴⁶ Watermarks are also used to ascertain the publication date of etchings by Rembrandt.⁴⁷ The Giunti firm purchased a number of books printed in 1550 with damaged first and last pages. They petitioned to be allowed to reprint these pages, not with the original date, but with the year of the reprint, 1565. They asserted that wherever printing was practiced it was customary to print new title pages from time to time as the need arose. The officials gave their permission. In this example, watermarks can be misleading with regard to dating but it can also lead to a misconception about the life span of watermarks.⁴⁸ Therefore, although paper evidence may not solve or help to solve every problem,

³⁹ Ibid, pp. 32-3.

⁴⁰ Edward Heawood, 'The use of watermarks in dating old maps and documents', *The Geographical Journal*, 63 (1924), pp. 391-412.

⁴¹ Op. cit. (n. 10), p. 69.

⁴² Ibid, pp. 94-6.

⁴³ Op. cit. (n. 2), p. 35.

⁴⁴ Op. cit. (n. 2), p. 13.

⁴⁵ Conway, op. cit. (n. 18); Nesi, op. cit. (n. 26).

⁴⁶ Op. cit. (n. 1), pp. 14-15.

⁴⁷ Theo Laurentius, Erik Hinterding, Jan Piet Filedt-Kok, 'Het Amsterdamse onderzoek naar Rembrandt's papier; radiografie van de watermerken in de etsen van Rembrandt', *Bulletin van het Rijksmuseum*, 40 (1992), pp. 353-84.

⁴⁸ William A. Pettas, *The Giunti of Florence Merchant Publishers of the sixteenth century* (San Francisco 1980), pp. 180-81.

the imaginative and rational study of watermarks may produce important - and in many cases conclusive - evidence.

The only method of depicting a watermark from the nineteenth century well into the twentieth century was by means of tracings. In some cases, this method is still applied. The results are never accurate enough for exact identification of a watermark, since it depends on the interpretation of the person making the tracing. For a more accurate depiction, photography or radiography nowadays can be applied.⁴⁹ A scholar should not rely solely on the paper evidence. For solving the puzzle of a printed book, the font can also be used for confirmation. Paper and typographical evidence can enhance each other in the study of books. Scholars who choose to ignore relevant typographic information through partiality to paper evidence, or vice versa, should be held as imperfect bibliographers.⁵⁰

Watermarks in printed matter in Florence between 1477 and 1487

No date of publication is mentioned in the colophon of the *Geography*, which has led to debate in the relevant literature. We have therefore decided to study the watermarks in Tedesco's printed matter with the expectation that this would lead to more clarity. This also provides an overview of the watermarks in the paper used in Tedesco's printing office between 1477 and 1486. Books in various formats with information about the date of publication were selected, as it was expected that they were the most likely to supply a useful array of watermarks. We also included some smaller works from the period when the *Geography* was presumably printed, for comparison. Further, it was decided to study the translation of Plato's works by Ficino printed in the same period in the San Jacopo di Ripoli monastery, another printing office in Florence. Berlinghieri was involved in the production of this book.⁵¹ During the research, it turned out that in some of the consulted books, several publications were bound together. Two of them concerned books from again the same period but printed by two other printers in Florence. We decided to also include the watermarks from these books for comparison. An overview of all the works studied can be found in attachment two. We selected the books based on data found in the Gesamtkatalog Wiegendrucke.⁵² Mostly, several copies were examined, and in one case a single example because it was the only known copy. The images of the watermarks detected in the books printed by Tedesco are presented in figure 45-143. Those present in books printed by other printing offices in Florence are displayed in figure 144-69. The ones found in the *Geography*, the subject of our study, are shown separately in figure 170-338. They are subdivided according to which section of the book they were found in. As there is no consensus until now on when the *Geography* was printed, we searched for references of the detected watermarks in data bases. They are provided in attachment one. An overview of all the watermarks found in the other studied printed matter in Florence are given in attachment three. We did not add references for them because in most cases the publication date is known.

After studying the overviews and the individual watermarks, we were able to establish several facts. Each book or oration contained its own or unique set of watermarks. Some types of watermarks occurred over a longer period and were found in several books or *oratorios* but as a rule in a different variant. The same was observed during a research of seventeenth century archival matter in the archives of Zeeland, the Netherlands. No watermarks from a particular year were found in later dated documents. In effect, the paper was used immediately and completely.⁵³ These observations are in line with those by Stevenson and Piccard. Stevenson addressed the question of the time span between paper fabrication

⁴⁹ David Woodward, 'The analysis of paper and ink in early maps: opportunities and realities', *Essays in Paper Analysis*, (Cranbury 1987), pp. 204-5, 213, 215; David Woodward, *Catalogue of Watermarks in Italian Printed Maps ca 1540-1600* (Florence 1996), pp. 10-11.

⁵⁰ Op. cit. (n. 10), pp. 94-6.

⁵¹ Conway, op. cit. (n. 18), pp. 17, 46, 268-72, 276; Nesi, op. cit. (n. 26), pp. 27-8, 104-08, 112.

⁵² Incunabula can be searched in the Incunabula Short Title Catalogue of the British Library: https://data.cerl.org/istc/_search, or the Gesamtkatalog der Wiegendrucke of the Staatsbibliothek zu Berlin: <https://www.gesamtkatalogderwiegendrucke.de>

⁵³ Laurentius, op. cit. (n. 20), p. XVIII; These catalogues were made with the intention to provide objective reference material for the research of paper use in the Netherlands in the seventeenth century. Laurentius is of the opinion that there is a great need for this kind of research in other European sources and that there still is a lack of reference material with objectively dated use by means of dated documents from archives or notaries. By assembling catalogues with verified dated material, a valuable tool for reference can be created.

and use. He wrote that paper was used within one to three years after it was produced.⁵⁴ Piccard also described that paper was consumed within three to four years.⁵⁵ The books studied had different formats, of which some occurred more than once. It was striking that the smaller and larger formats were generally characterized by different types of watermarks or different variants of watermarks and or in another size. It was also noticed that in books with a similar format, printed in a short consecutive period, sometimes exactly the same watermarks were found. An example of this is the presence of the same watermark lily in the paper of the books *De re aedificatoria* and *Sermones super cantica canticorum*, both printed in 1485 and in the same format (Fig. 121, 134). An even greater similarity in paper use, based on the appearance of exactly the same variants of the watermark cardinal's hat type 1a, 1b, 1c, 1d, 4a, 4c, and 4d, was found in *La Divina Commedia* and Berlinghieri's *Geography*, both printed in folio format (Fig. 76-80, 82-4, 170-78, 189, 191-92). This will be discussed more extensively further on. The fact that in smaller books other watermarks, or watermarks in a smaller size, were found is understandable. Usually a smaller, thinner, and also cheaper format paper was applied for these books. Despite the differences in paper use for each individual project, certain types of watermarks recurred throughout almost the entire period studied, such as the ox and the cardinal's hat. Those were apparently popular and widely used watermarks. The in some cases great similarities between those watermarks suggests that paper from certain suppliers has been used over a number of years.

A number of watermarks deserve some specific attention. The nearly identical variant of the watermark cardinal's hat type 3 was detected in just two sheets of one copy only of *La Divina Commedia* (Fig. 81). An even rarer find was the watermark shearer scissors in only one sheet of the three copies of the much more voluminous book *Moralia in Job* (Fig. 117). It was a variant or twin mould of the shearer scissors watermark present in Berlinghieri's *Geography* with the same size (Fig. 201-02). These seem to be examples of residual sheets of paper that were used as spare paper in case something went wrong. This will be further highlighted in chapter five about the text pages. A watermark very rarely found concerns the R in a circle with probably a cross on top. It was present in just one sheet of only one of the copies studied of the book *Monte santo di Dio* and in one sheet of the only examined copy of the book *Disputationes Camaldulenses* (Fig. 68, 74). According to us they are twin moulds but it is difficult to establish definitively because in both books the watermarks are not fully and completely observable. Something similar applies to the watermark cardinal's hat type 2 and 3. Type 2 was found twice in one copy only of the book *Monte santo di Dio* and only once in the book *Disputationes Camaldulenses*, type 3 only once in just one copy of *Monte santo di Dio* (Fig. 45-6, 75). In our opinion they are identical to the ones present in Berlinghieri's *Geography* (Fig. 180-88). In the books *Monte santo di Dio* and *Disputationes Camaldulenses* they are also not fully and completely observable. The same applies to a less rarely present identical variant of the watermark ox found in the books *Monte santo di Dio* and Berlinghieri's *Geography* (Fig. 62, 196). Thus, the longest life span of a specific watermark in this study was about five years.

Next, we compared the paper use in Tedesco's printing office with that of the other three offices in Florence with the restriction that only a few books of these other offices were studied. It is striking that closely related variants of the same types of watermarks were used in all four printing offices in corresponding periods. The similarities between the watermarks in Plato's work printed in the Ripoli Convent and published in May 1484 and April 1485 and those present in the book *De re aedificatoria* printed by Tedesco and published in December 1485 are striking. It is also noteworthy that both, the book *Moralia in Job* printed by Tedesco and Plato's work printed in the Ripoli convent, contain closely related variants of the watermark cardinal's hat type 7. From an agreement between Tedesco and his financier, described by Ridolfi, it is known that the paper for the book *Moralia in Job* must have been ordered in the end of 1483.⁵⁶ This also corresponds well with the publication and thus the purchase of paper for the first volume of Plato's work published in May 1484. The paper purchases for Plato's work are described in the diary of the Ripoli monastery. According to the notes in this diary, over a period of more than seven months, 24 orders for substantial amounts of paper per order were made specifically

⁵⁴ Op. cit. (n. 10), pp. 94-6.

⁵⁵ Op. cit. (n. 2), p. 35.

⁵⁶ Ridolfi, op. cit. (n. 18), pp. 145-48.

for Plato's work, regularly several times a week and sometimes even on consecutive days.⁵⁷ The reason for this could be that the Ripoli printing office was awarded the printing only after a successful tender. It was therefore not in a position to purchase paper in advance. These orders and deliveries are not specific to Plato's work. The diary contains similar notes on deliveries for other books. Sometimes even several deliveries on the same day. So, it seems to illustrate the usual way of working. This indicates that the required paper must have been purchased from different suppliers. Ross King described that already in the days of Vespasiano da Bisticci eight booksellers were active besides an illuminator of manuscripts, two painters, and other craftsmen in the Via dei Librai in Florence. Among other things, they sold paper in all shapes and sizes that they bought from paper mills in the region.⁵⁸ Paper manufacturers did not deliver on consecutive days or several days in a row for months. It is therefore clear that the Ripoli printing office bought the necessary paper from different *cartolaio's* or workshops in Florence. The *cartolaio's* bought paper from different papermakers in the region.⁵⁹ They sorted by size and sold in smaller batches. All this explains the great variety of watermarks found in the books described in this paragraph. Paper from a single paper maker would be of a much more homogeneous type regarding the watermarks. In view of the above-mentioned similarities in paper consumption between the Ripoli printing office and that of Tedesco, it can be deduced that Tedesco also acquired his paper locally in Florence from the *cartolaio's*. The findings concerning Francesco di Dino's and Bartolomeo de Libri's printing offices point in the same direction, although only two books printed by them were included in the study.

The watermarks in Berlinghieri's *Geography*

For the *Geography*, predominantly sheets of paper in royal size were applied. These sheets were cut in two halves to print the text pages in folio format. For the maps of the first type and those printed by Giunti, complete sheets of paper in royal size (61 x 44 cm) were used.⁶⁰ The maps of the second type were printed on complete sheets of paper of an obviously smaller size because watermarks were found in the paper of both halves of these maps. In this chapter, we will limit ourselves to the description of the watermarks found in the paper of the text and gazetteer pages, the register page, the fly leaves and interleaves, the maps, and the backing of the maps. Further interpretation of these findings will follow in the chapters five and six on the text and the maps. As illustration for the watermarks in the text pages, nine photographs of watermarks from the interleaves were used. They were much clearer in the absence of printed text and matched exactly with those present in the text pages. On some images of the watermarks found in the maps no details of a map are present. The explanation for this is that in a few cases an x-ray was used. In some other maps the watermarks were detected outside of the image of the map. Generally, the photos of the watermarks found in the backing sheets were made at an angle to procure a shadow image. In five cases, an image with light coming from behind was made. In three cases an x-ray was applied again. For the watermark cardinal's hat type 5 an image found in a map was used. We were not able to take a clear picture from it in a backing. The same applies to the watermark column. It is represented by a tracing of a somewhat comparable example (Fig. 317). We have decided not to display all the watermarks present in the backings. They were sometimes difficult to observe, resulting in an inferior quality of the images, which made identification and distinction of variants and twin moulds very hard. We also included several photos from maps with two watermarks super-imposed or present in the same half of a map, as proof of the use of a second sheet as backing. A last remark concerns the watermarks in the map section, starting with the watermark hand with a star on top up to and including the watermark crossed arrows in a circle with a star on top (Fig. 250-82). They must be disregarded in relation to Tedesco as they belong to the later edition printed in the sixteenth century by

⁵⁷ Conway, op. cit. (n. 18), pp. 17, 46, 268-72, 276; Nesi, op. cit. (n. 26), pp. 27-8, 104-08, 112.

⁵⁸ King, op. cit. (n. 4), p. 13; Pettas, op. cit. (n. 48), p. 150.

⁵⁹ Conway, op. cit. (n. 18), pp. 26-8, 327-31; Nesi, op. cit. (n. 26), p. 59.

⁶⁰ The different types of maps will be explained in chapter six about the maps.

Giunti.⁶¹ This is confirmed by the references found in data bases regarding the watermarks present in this type of maps as described in attachment one.

The chronology of the books printed by Tedescho

The chronology of the different books printed by Tedescho can, at first sight, be determined from the dates mentioned in the colophon when available. In the *Geography* this information is lacking. In the previous paragraphs, we described that new paper was purchased for each new project. So, it seems justified to determine the chronology from the watermarks. According to us and based on the watermarks, the *Geography* was printed in between *La Divina Commedia* dated August 30, 1481 and *Horae Beatae Mariae Virginis* dated July 5, 1483. The different variants of the watermark cardinal's hat type 1 and 4 are abundantly present in *La Divina Commedia* as well as in the *Geography* (Fig. 76-80, 82-84, 170-78, 189-93). The cardinal's hat type 1c was found in Landino's *Oratio* with comments about Dante, dated after August 30, 1481, and before 1483 (Fig. 90). The watermarks P and three mountains in a circle with a cross on top, very regularly detected in the maps, were not present in any other book printed by Tedescho and studied by us (Fig. 238-45). In the same type of maps several variants of the watermark cardinal's hat type 7 were infrequently found (Fig. 246-49). It was the only watermark present in the sole known copy of the very small prayer book *Horae Beatae Mariae Virginis* dated July 5, 1483.⁶² Because of its small size, only parts of the watermark were detected. Nevertheless, their size and shape correspond unmistakably with multiple variants of the watermark cardinal's hat type 7 (Fig. 97).⁶³ In our opinion the *Geography* therefore must have been printed following *La Divina Commedia* instead of before and before *Horae Beatae Mariae Virginis*. Conway presents in her thesis an overview of printed books in Florence between 1476 and 1484.⁶⁴ Examination of this list makes the printing of the *Geography* in between the two books mentioned in 1482 plausible. This sequence is further confirmed by the mentioning of the appointment of Federico d' Urbino as general on April 17, 1482, in the text of the *Geography*. It will be further substantiated and specified in the following chapters.

Nearly identical and closely related variants of the cardinal's hat type 7 watermark were also found in the book *Moralia in Job* (Fig. 100-04). Some other aspects relating to this book are worth mentioning too. Tedescho created a notarized limited partnership for this project with a "pharmacist/grocer" Antonio di Luca di Berto. This person brought in the money, 150 ducats in gold. Tedescho contributed staff, printing presses, paper expertise, and book printing. An agreement between the parties was established and signed on August 8, 1483.⁶⁵ The intended print run was 1025 copies. The book contains about 1250 pages. The date of publication according to the colophon is June 15, 1486. Ridolfi noted the absence of any publications by Tedescho, as none are known, from 1484. He could not provide an explanation.⁶⁶ In those days, printing a book of 1250 pages in an edition of 1025 copies must have been an enormous task. The printing of the book *Moralia in Job* must have lasted from 1483 to 1486, during which Tedescho published two other large books in 1485: *Sermones super cantica canticorum* and *De re aedificatoria*. In all, he must have been working very hard to get all these projects completed. We detected the same watermarks and their variants in the paper from the beginning to the end of the book *Moralia in Job*. They were not present in the mentioned books printed in 1485. This again shows that paper was ordered each time again for a specific project. It can be concluded that the paper for the entire book *Moralia in Job* was ordered and delivered at the start of the project after August 1483. Therefore, the watermarks present in this book will date from 1483. The year 1486 in the

⁶¹ These watermarks were found in maps printed by the Giunti printing office in the sixteenth century as will be explained in the following chapters.

⁶² Biblioteca Riccardiana, *Horae Beatae Mariae Virginis ad usum Ecclesiae Romanae* (Florence 1483), shelfmark Ed.R.726.

⁶³ Several variants of the watermark cardinal's hat type 7 were also found in Ficino's book with the works of *Plato* printed by the Ripoli printing office in 1484.

⁶⁴ Conway, op. cit. (n. 18), pp. 305-14.

⁶⁵ Ridolfi, op. cit. (n. 18), p. 146.

⁶⁶ Ibid, p. 149.

colophon is only related to the year of publication.⁶⁷ This is the reason why we have placed this book in 1483 instead of 1486 in our attachments. Two other books, *Disputationes Camaldulenses* and *La Sfera*, like the *Geography*, contain no colophon. The first one is dated not after September 12, 1481, and the other one about 1485 by the Gesamtkatalog Wiegendrucke. The watermarks found in these books do not contradict this. The same applies to the two *oratio*'s included in our study. For these, too, the dating applied by the Gesamtkatalog Wiegendrucke is not contradicted by the watermarks detected in the paper on which they are printed.

Concluding remarks

The findings presented in this chapter provide an overview of the use of paper between 1477 and 1486 in Tedesco's printing office. They only represent one printing office in Florence at the time. The differences between the printing houses in the early days of printing in Florence however do not appear to have been great. The diary about the printing office of San Jacopo di Ripoli provides a comparable picture to Tedesco's workshop.⁶⁸ This is confirmed by the finds of Plato's work printed by this printing house and the work of two contemporary printers in Florence included in our study. Most printing offices were small and had a constant lack of money in a market with a surplus of available printed books in relation to the purchase of books.⁶⁹ New paper was most likely only ordered and purchased from local sources when a project was secured. It is therefore plausible that the same type of paper was and may be found in other nearby printing offices in the corresponding period. The stocking of large amounts of paper by publishing houses would become common practice later. The paper use of for instance the Giunti firm demonstrates this.

The paper use in the text pages of Berlinghieri's *Geography* is consistent in all the copies studied. That does not apply to the maps. Based on the watermarks, there were unmistakably three print runs of the maps. By studying the watermarks found in the text pages, interleaves, maps and their backings, it can be established that they were printed around 1482 except for the maps printed during the third print run, which must have been printed around 1525. Considering the chronology of the paper use in Tedesco's printing office, we can date the printing of the *Geography* in 1482 (attachments one, two and three).⁷⁰

The watermarks provided another important fact regarding the working method of Tedesco. Identical variants of the watermarks cardinal's hat types 1c and 1d, as well as several nearly identical variants of the watermark cardinal's hat type 7 and the watermark shearer scissors were detected in the paper of the maps of the *Geography*, as well as in the paper of the text of the *Geography* and several other books with only printed text by Tedesco. From this can be deduced that Tedesco was capable of both relief- and intaglio printing and that both types of printing presses must have been present in his workshop.

⁶⁷ The Mainz *Catholicon*; Stephen Spector, 'Introduction', *Essays in Paper Analysis*, (Cranbury 1987), p. 20; The opposite can occur also. A book with a certain colophon may be reprinted years later without modifications of the colophon. In that case, the colophon misleadingly may refer to an earlier year, while the paper was produced some years later.

⁶⁸ Conway, op. cit. (n. 18); Nesi, op. cit. (n. 26).

⁶⁹ Op. cit. (n. 48), pp. 3, 4, 130, 134-40, 151; Conway, op. cit. (n. 18), pp. 10, 51, 58; King, op. cit. (n. 4), pp. 308-09, 366-67.

⁷⁰ Almagià described in his article the watermarks both he and Heawood had found in Berlinghieri's *Geography*. He further writes that he disagrees with Heawood who believes that there are two printed editions of the *Geography*, the second of which was printed at a much later date based on the watermarks. Our findings show that Heawood was right; Roberto Almagià, 'Osservazioni sull'opera geografica di Francesco Berlinghieri', *Archivio della R. deputazione romana di storia patria*, 68 (1945), pp. 219-20.

Books and oratio's printed by Tedesco from 1477 to 1486

Monte santo di Dio Antonio da Siena September 10, 1477

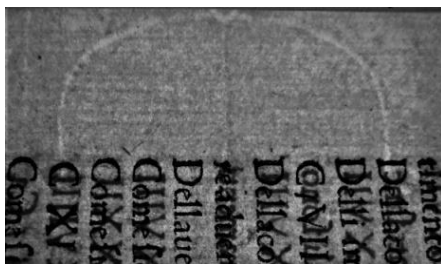
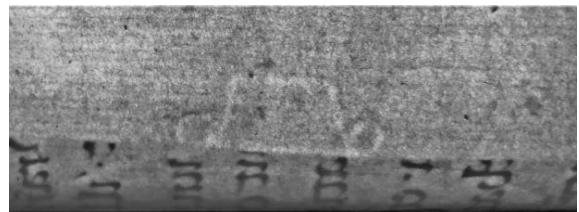
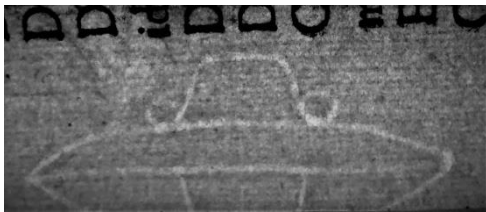


Fig. 45

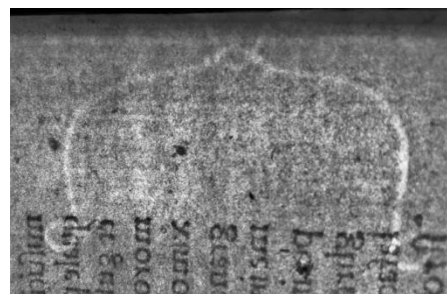


Fig. 46

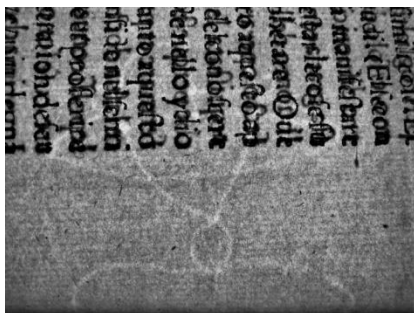


Fig. 47

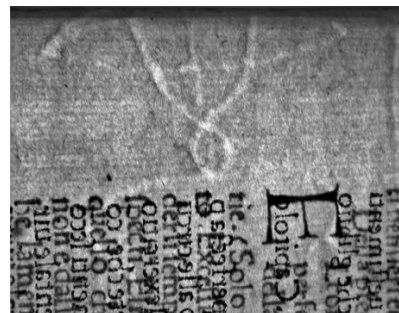


Fig. 48

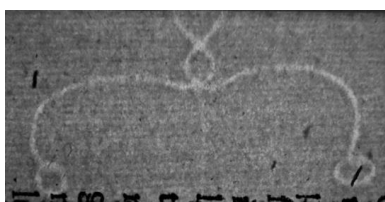
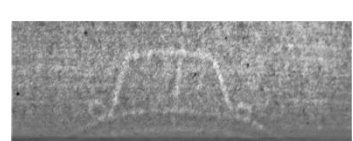
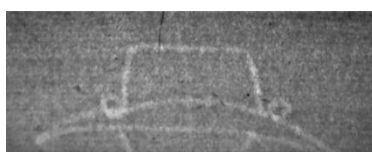
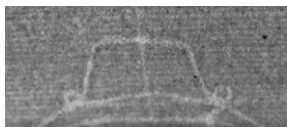


Fig. 49

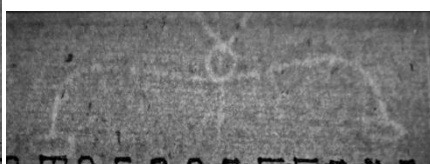


Fig. 50

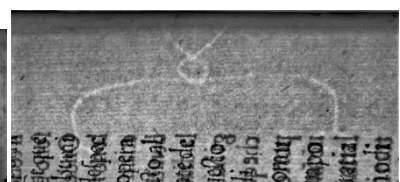


Fig. 51

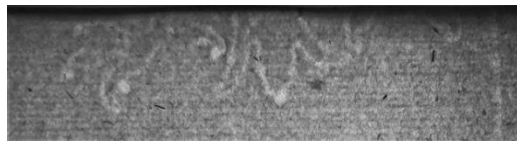
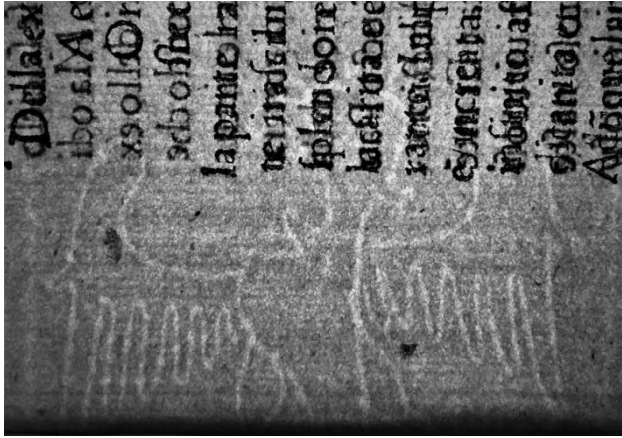


Fig. 52

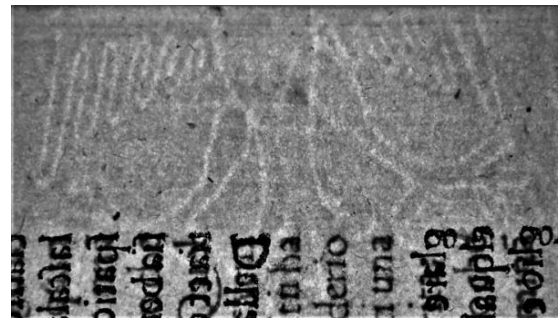


Fig. 53



Fig. 54

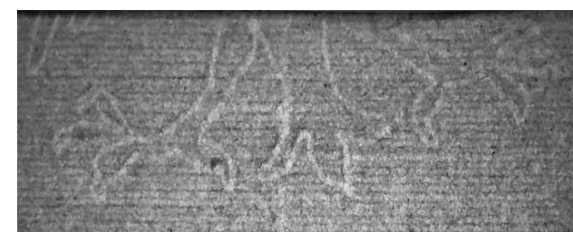
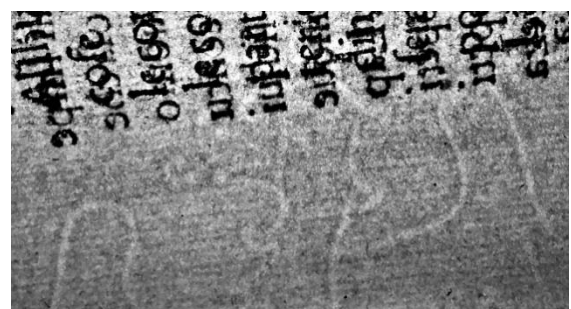


Fig. 55

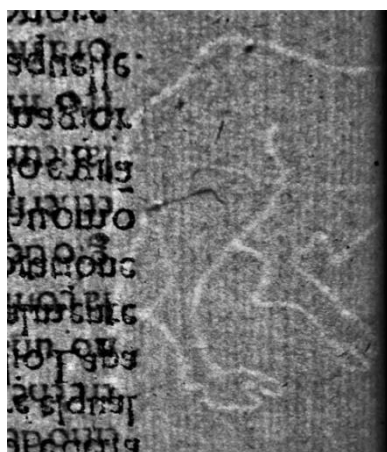


Fig. 56

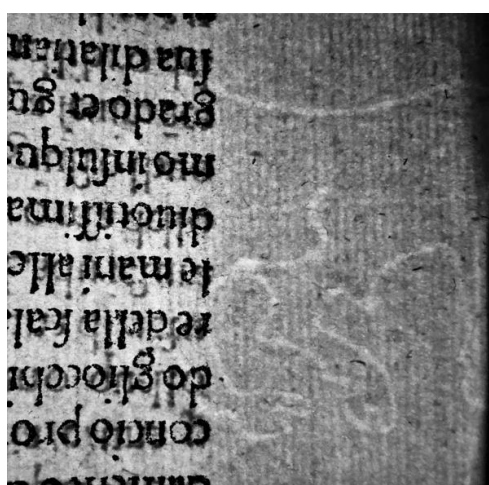
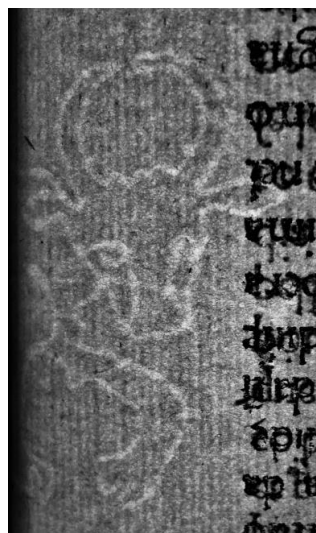


Fig. 57

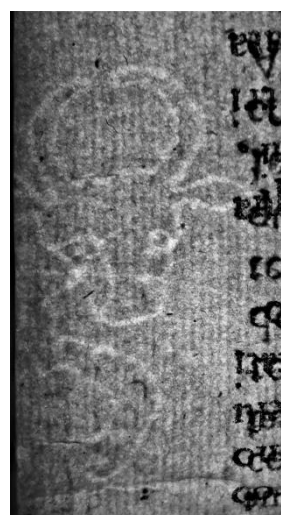


Fig. 58

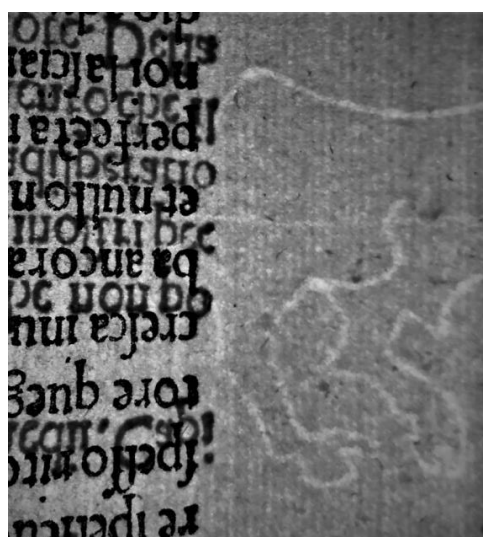


Fig. 59

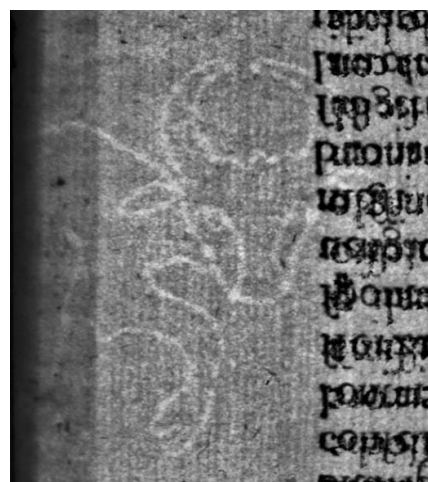


Fig. 60

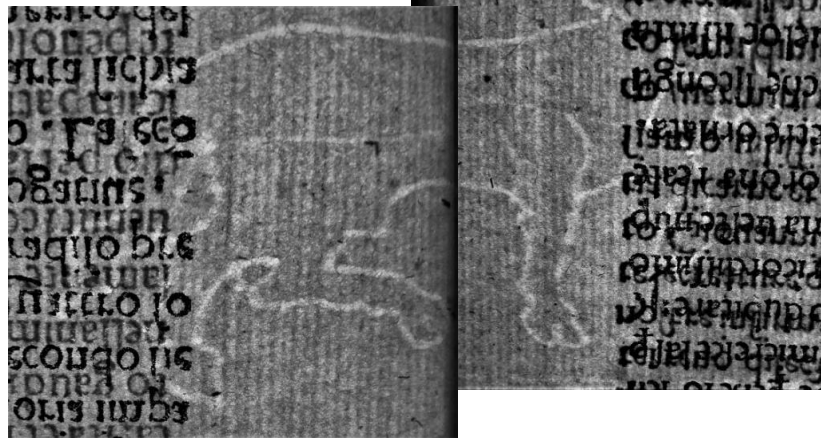


Fig. 61

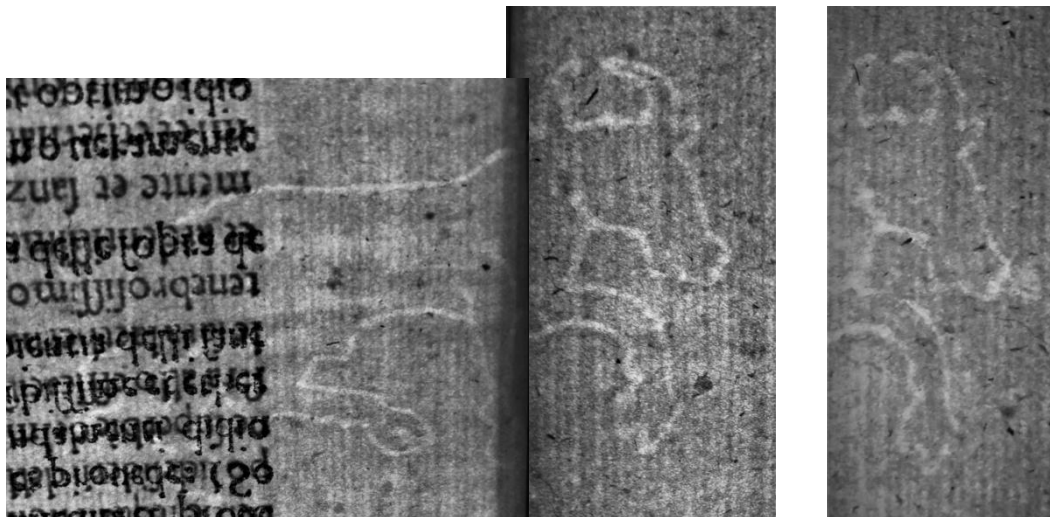


Fig. 62

Fig. 63

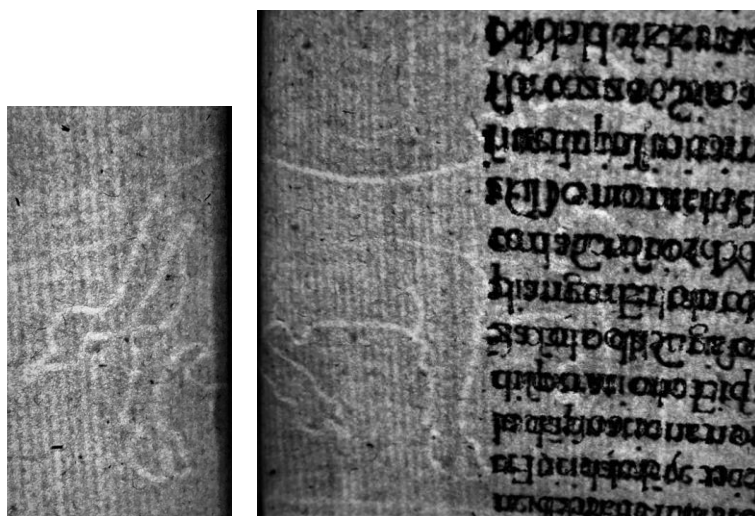


Fig. 64

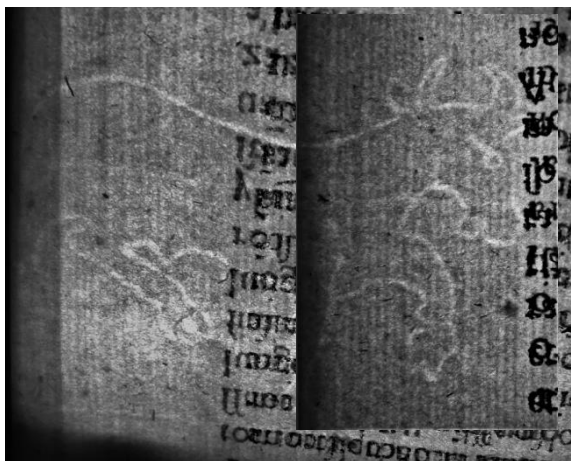


Fig. 65

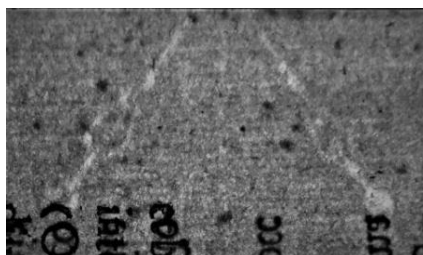
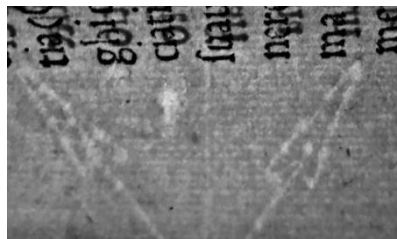
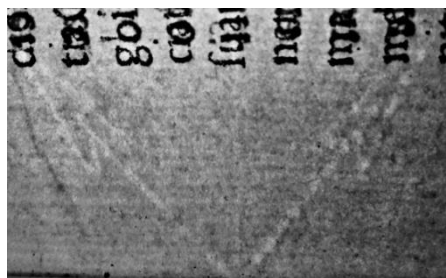


Fig. 66

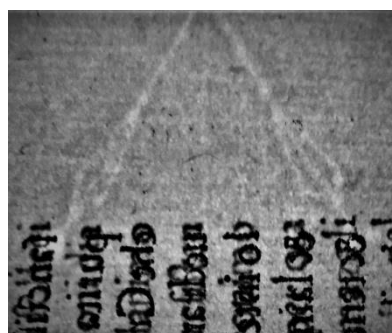


Fig. 67

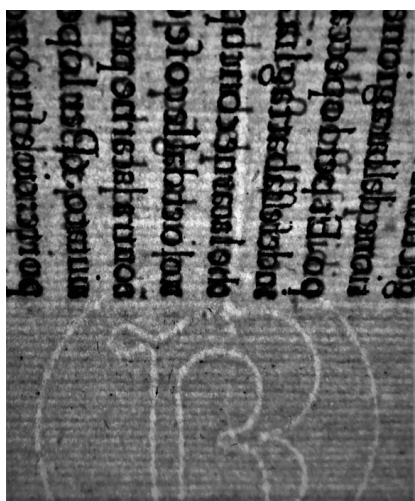


Fig. 68

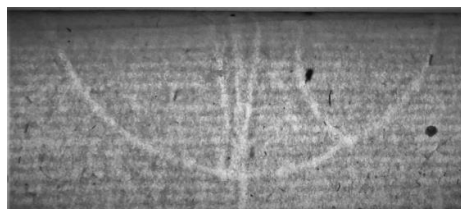
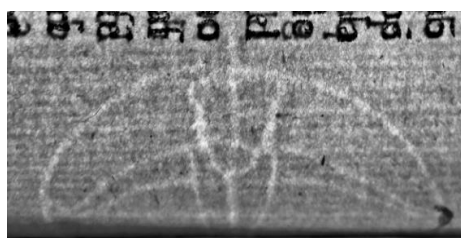


Fig. 69

Disputationes Camaldulenses

Landino

not after September 12, 1481

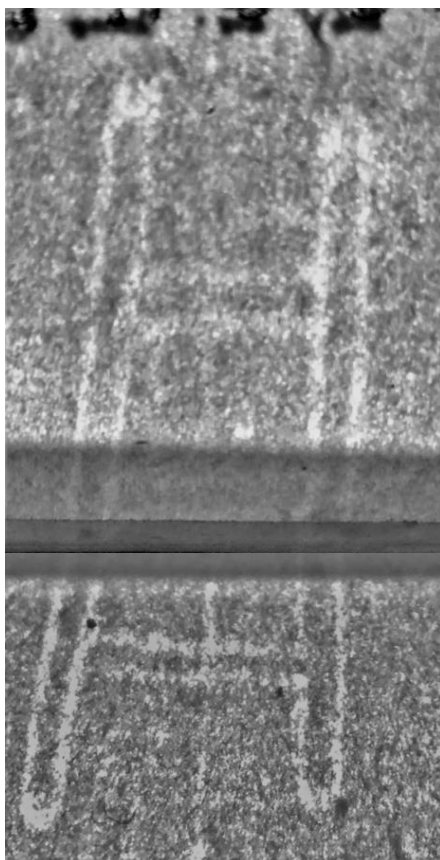


Fig. 70

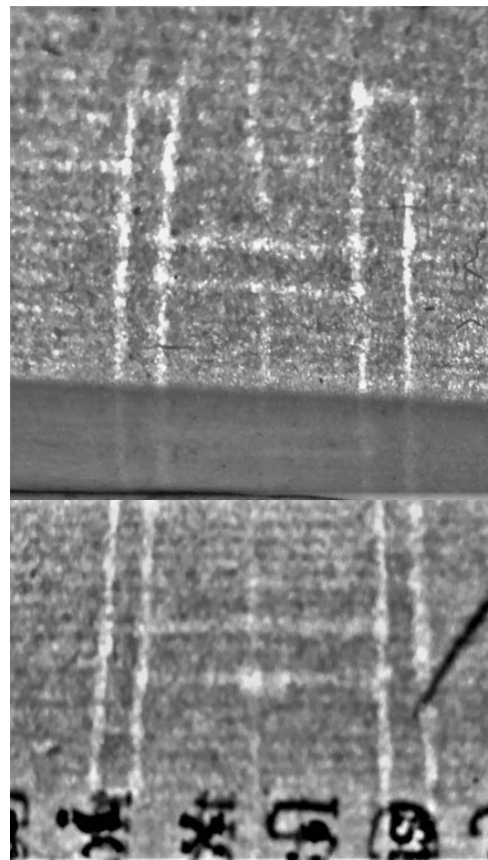


Fig. 71

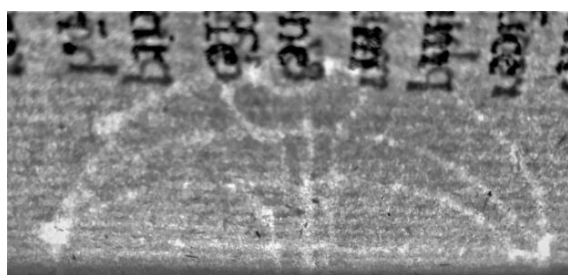


Fig. 72

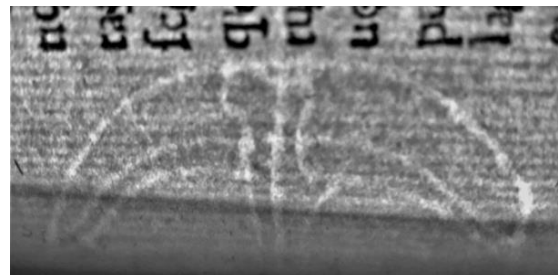


Fig. 73

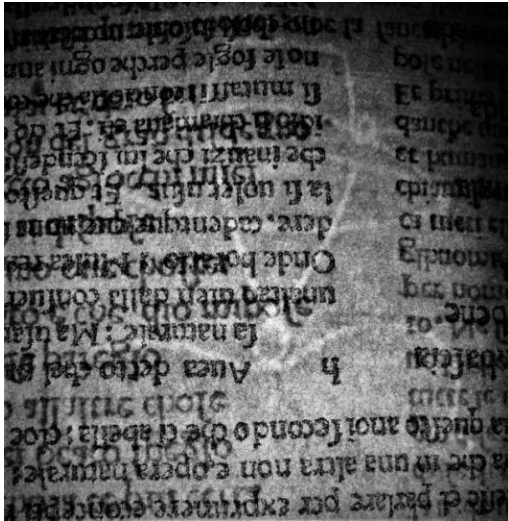


Fig. 80

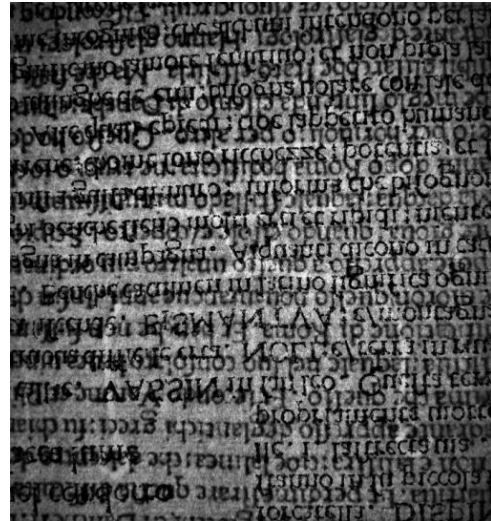


Fig. 81

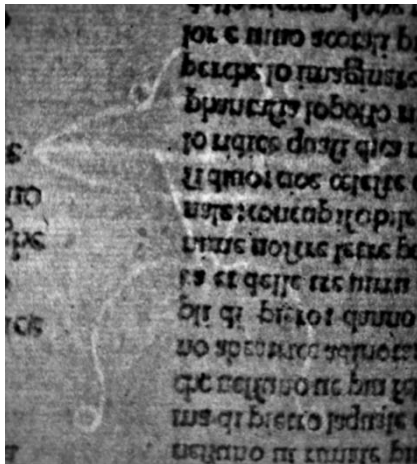


Fig. 82

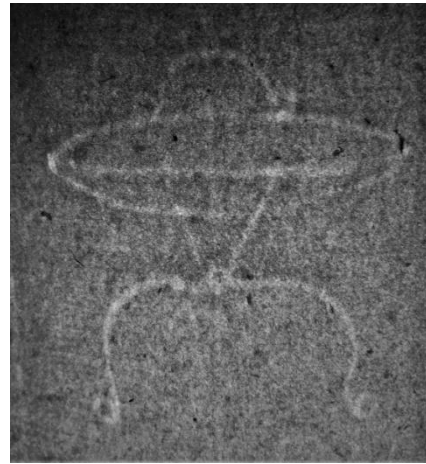


Fig. 83



Fig. 84

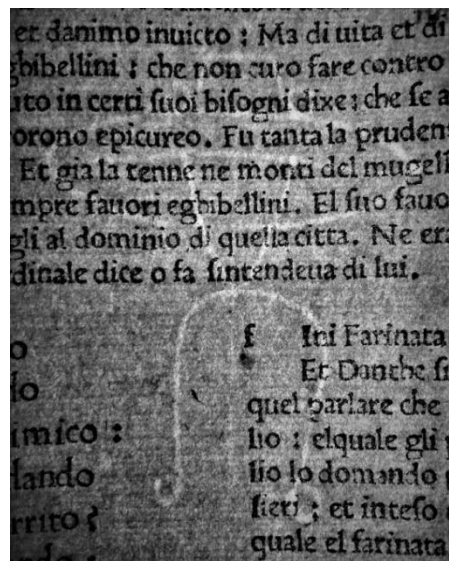


Fig. 85

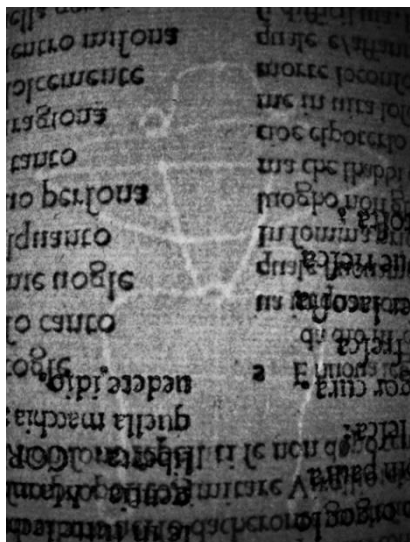


Fig. 86

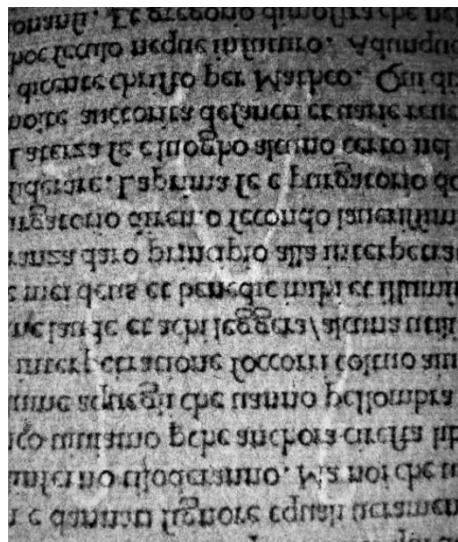


Fig. 87

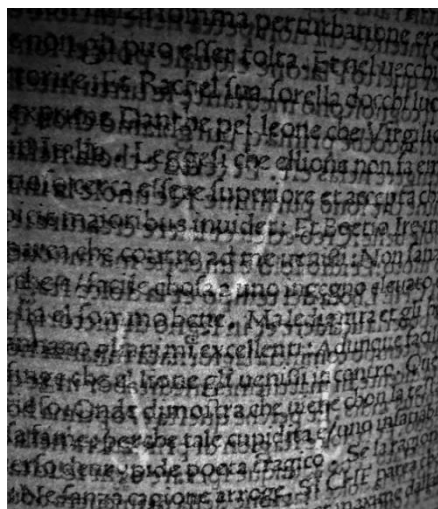


Fig. 88

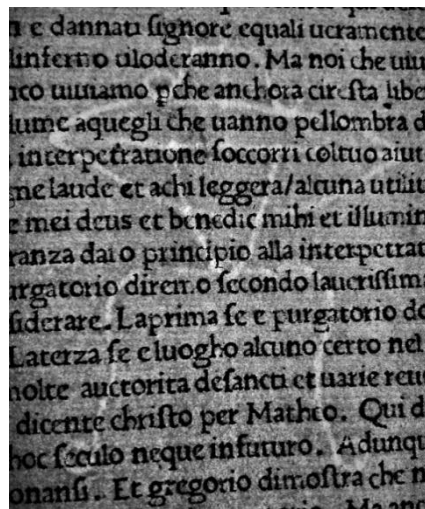


Fig. 89

Orazione alla Signoria Fiorentina quando presento il suo commento di Dante
Landino after August 30, 1481

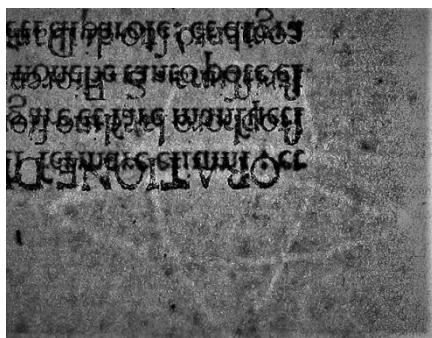


Fig. 90

Regole della vita spirituale e matrimoniale, second edition by Tedesco
 Cherubino da Siena October 22, 1482

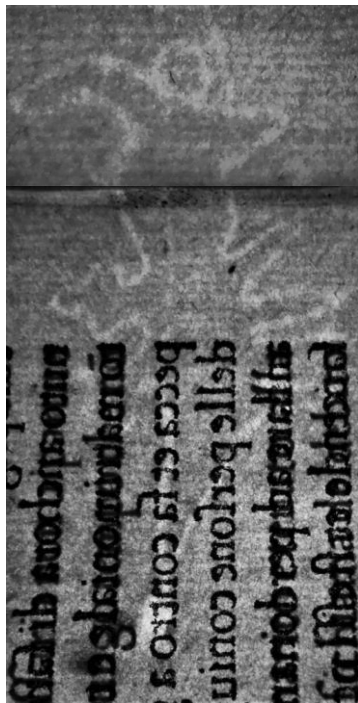


Fig. 91

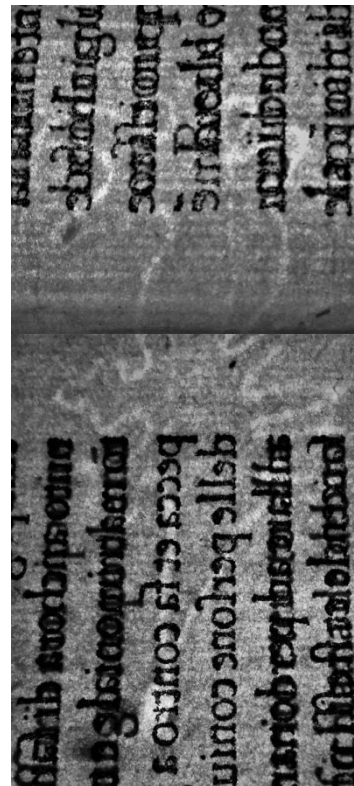


Fig. 92

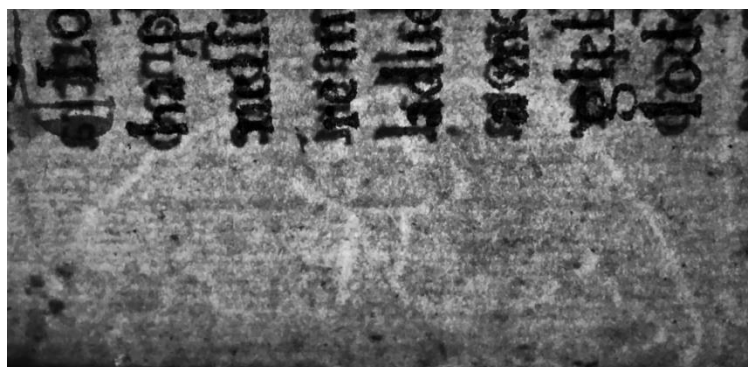


Fig. 93

In funere Jordani Ursini oratio Landino after March 13, 1483

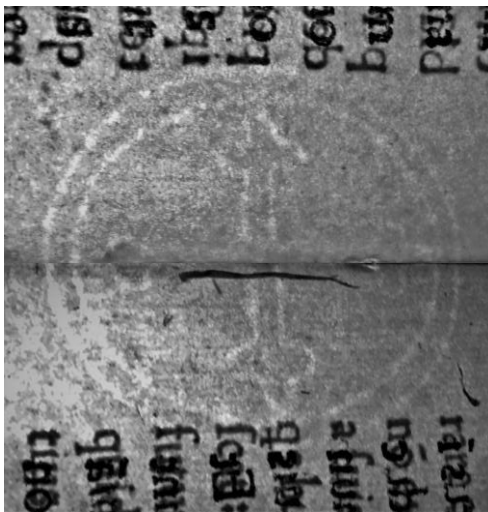


Fig. 94

Rudimenta Grammatices Perottus 16 april 1483

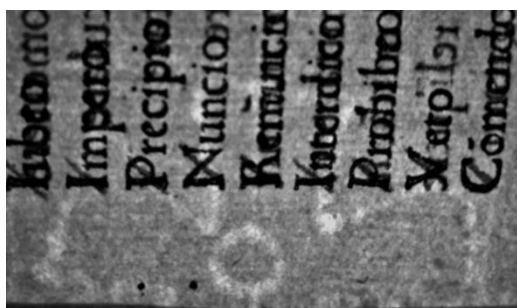


Fig. 95

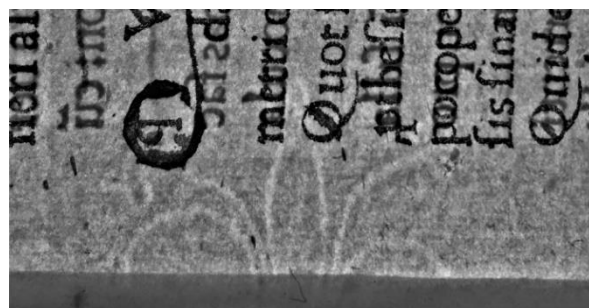


Fig. 96

Horae ad usum Romanum Unknown author July 5, 1483

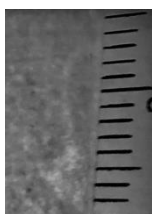
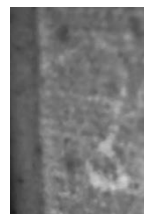


Fig. 97



Regole della vita spirituale e matrimoniale, third edition by Tedescho
 Cherubino da Siena July 31, 1483



Fig. 98



Fig. 99

Moralia in Job paper ordered at the end of 1483 and in the beginning of 1484
 Gregorius I Pont. Max. June 15, 1486

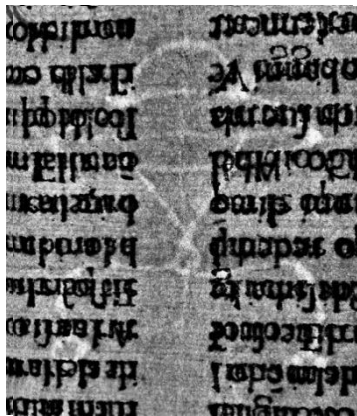


Fig. 100

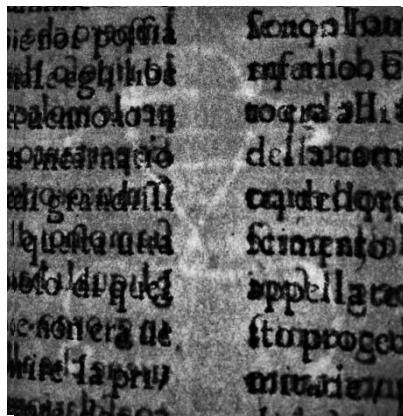


Fig. 101

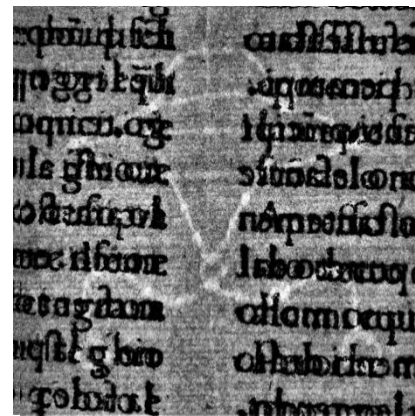


Fig. 102

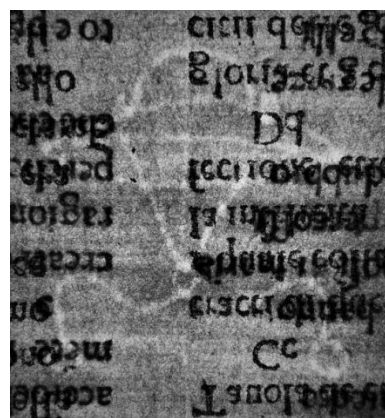


Fig. 103

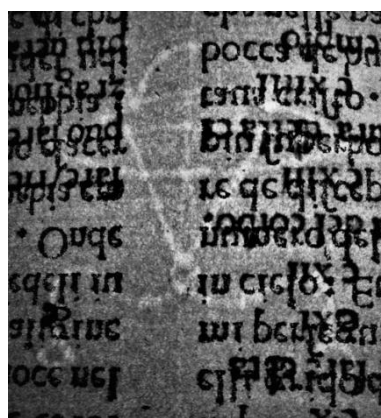


Fig. 104



Fig. 105

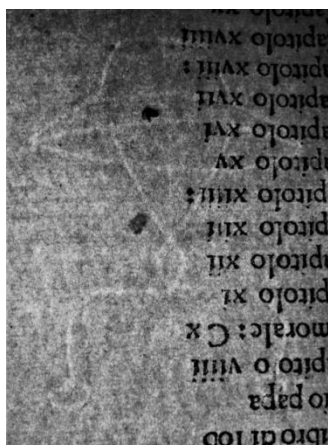


Fig. 106

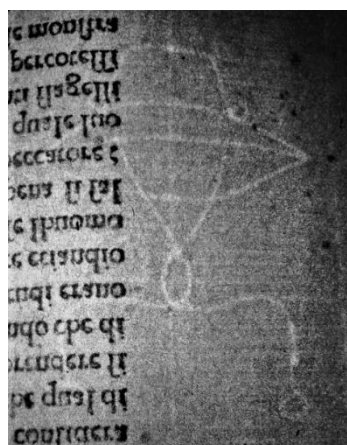


Fig. 107

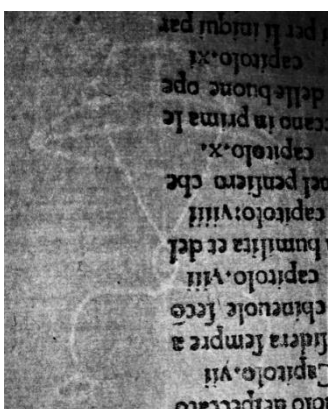


Fig. 108

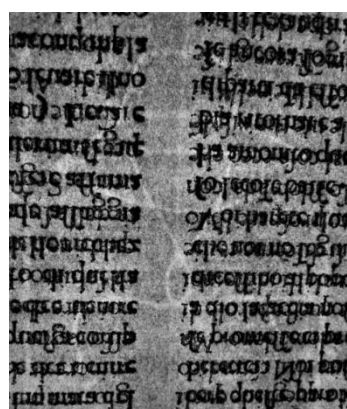


Fig. 109

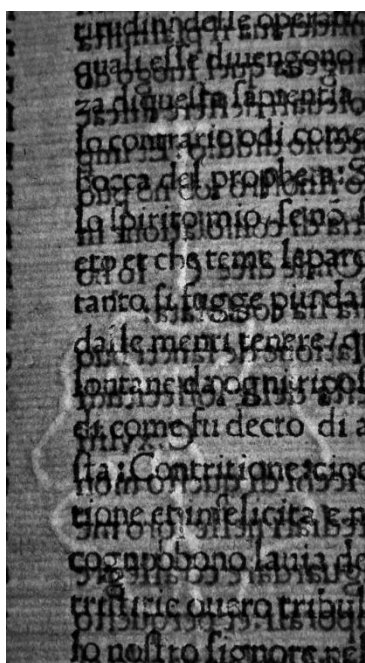


Fig. 110

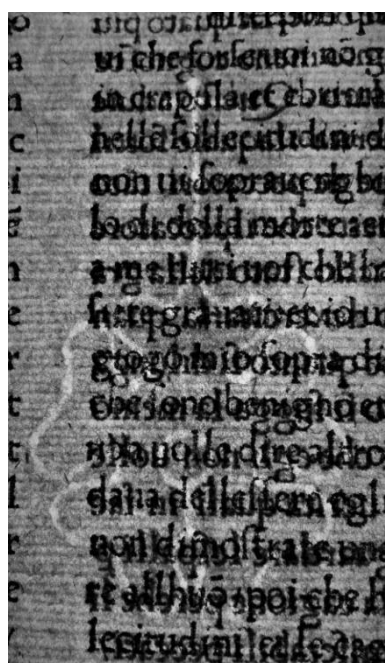


Fig. 111

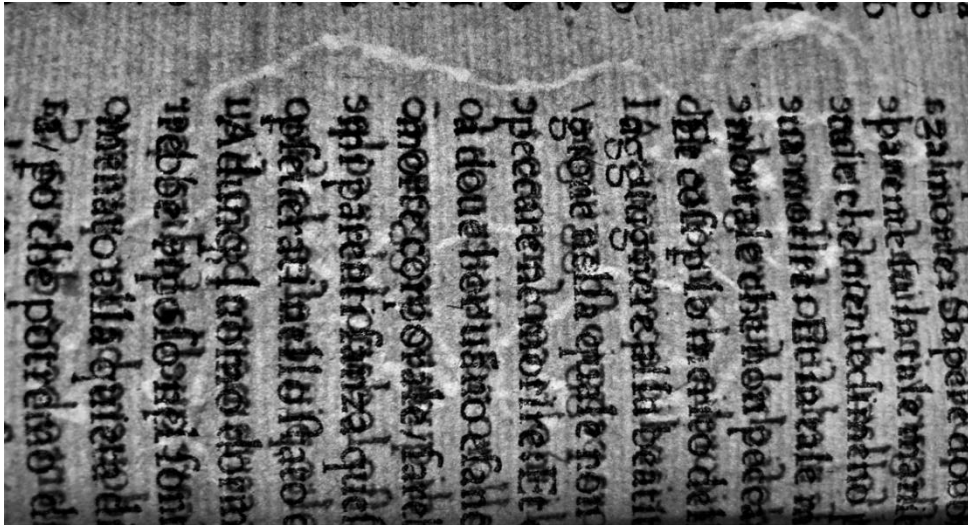


Fig. 112

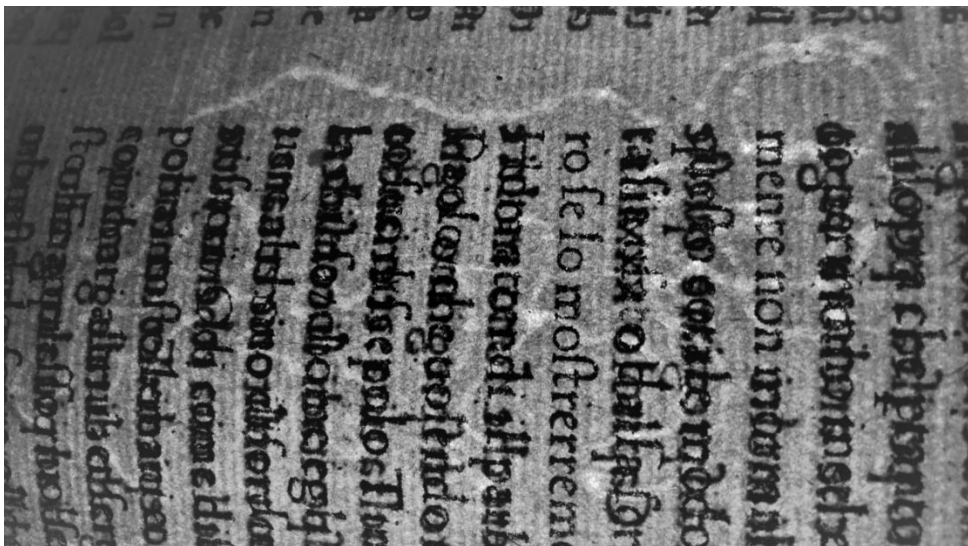


Fig. 113

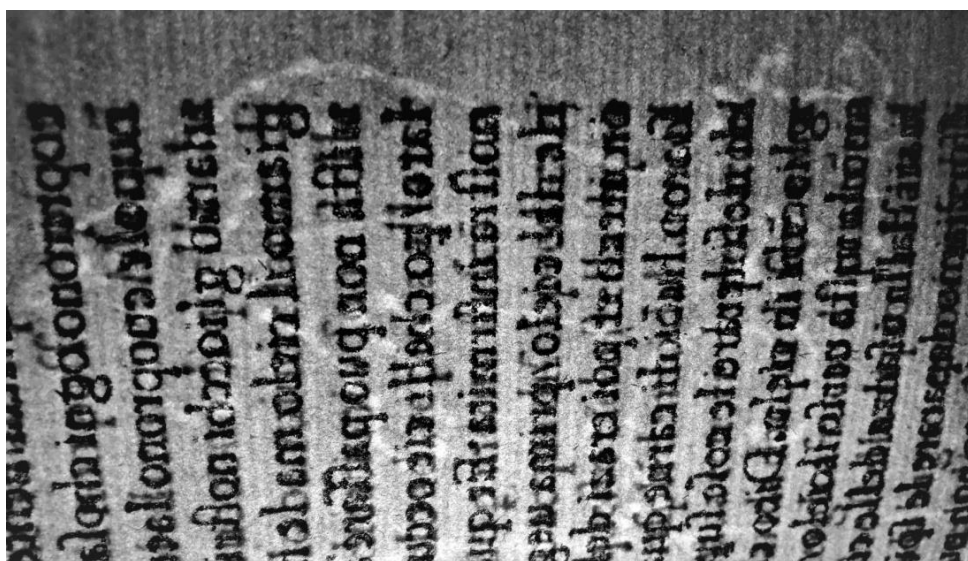


Fig. 114

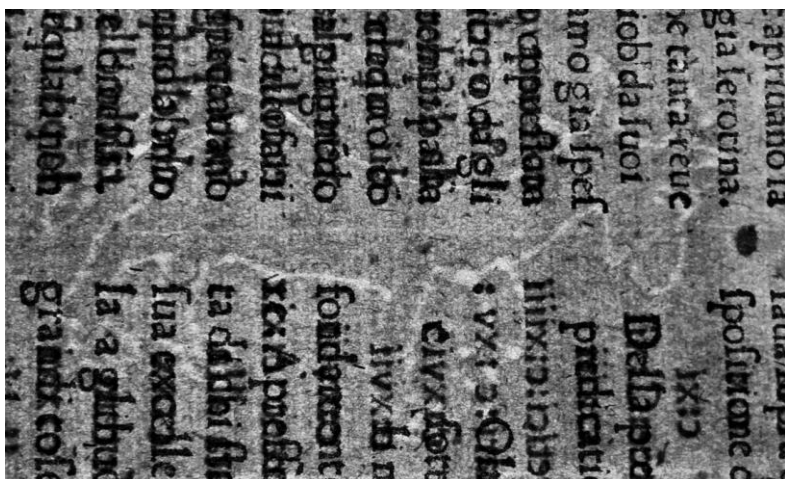


Fig. 115

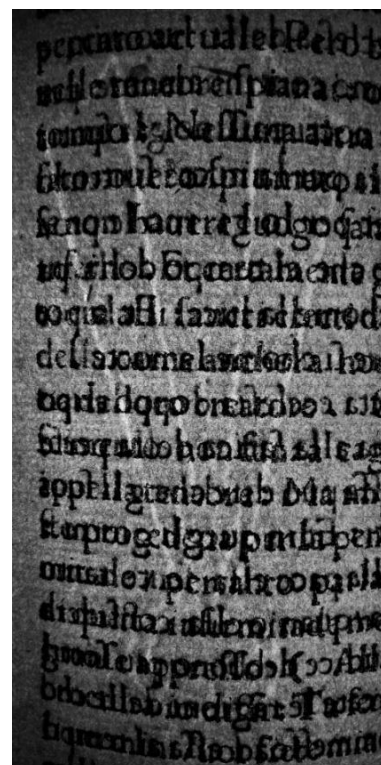


Fig. 117

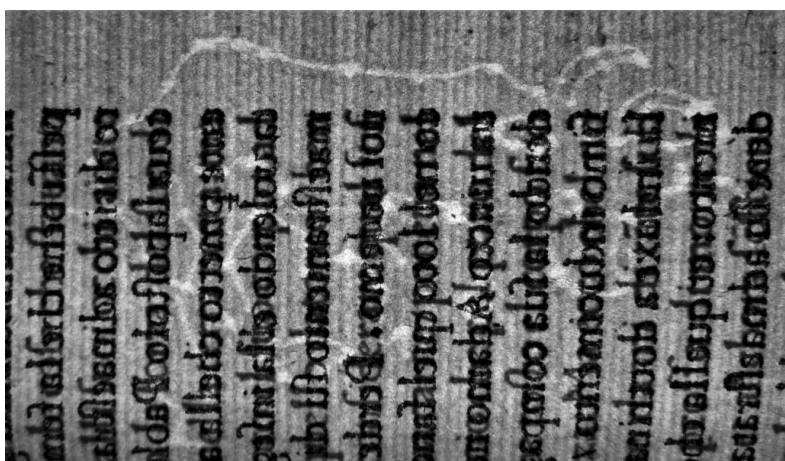


Fig. 116

La Sfera Dati about 1485

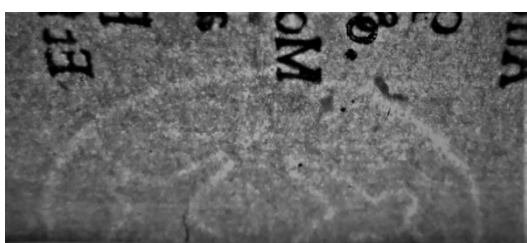


Fig. 118

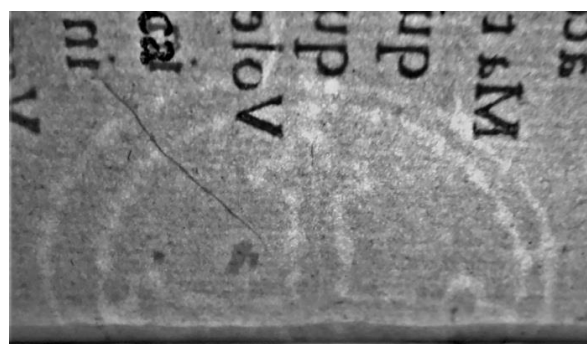


Fig. 119



Fig. 120

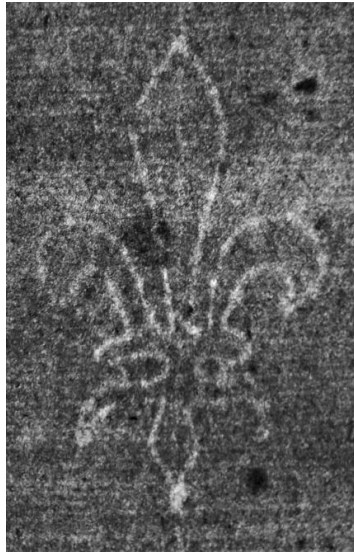


Fig. 121

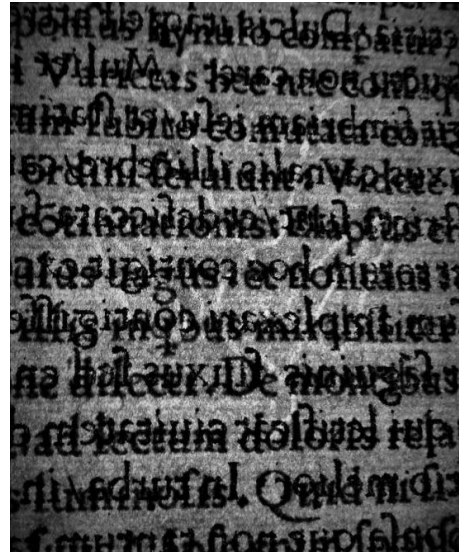


Fig. 122

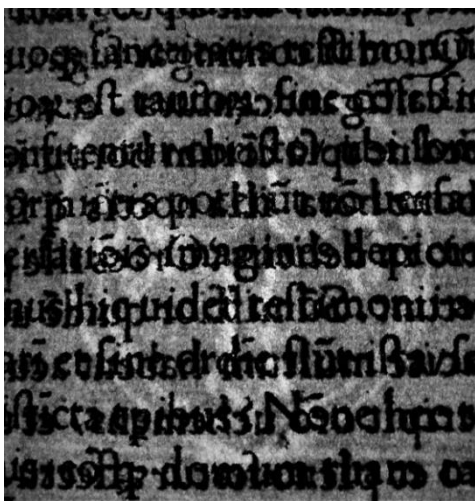


Fig. 123

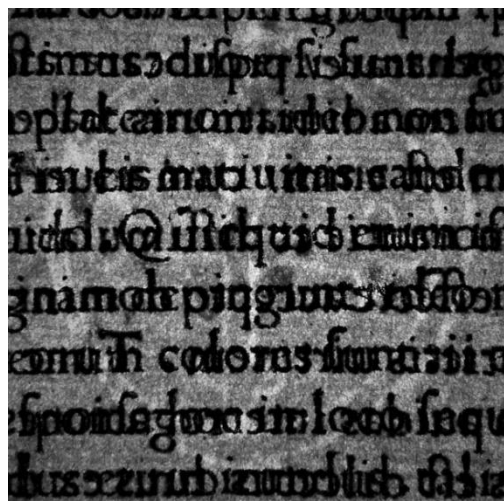


Fig. 124

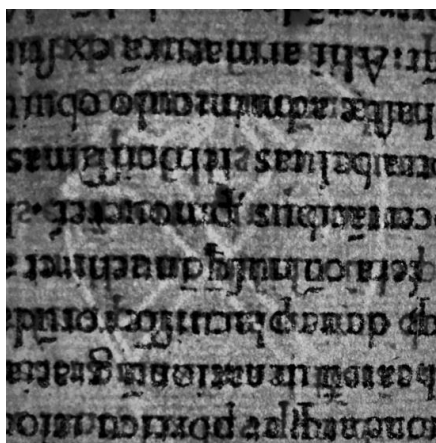


Fig. 125

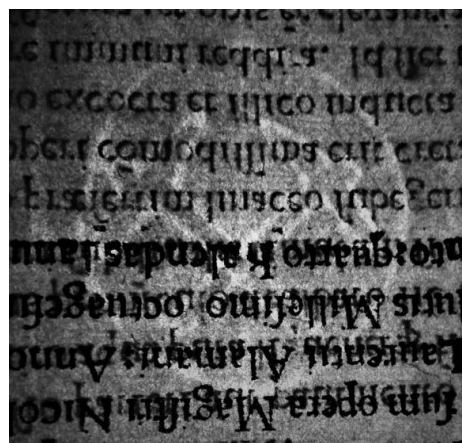


Fig. 126

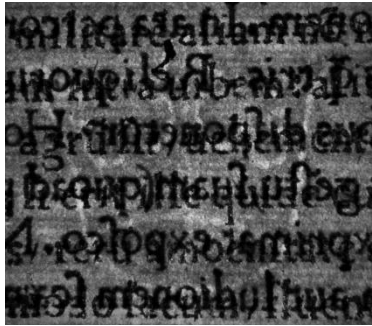


Fig. 127

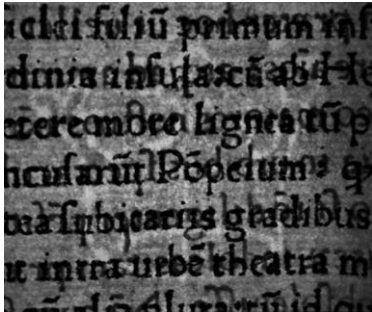


Fig. 128

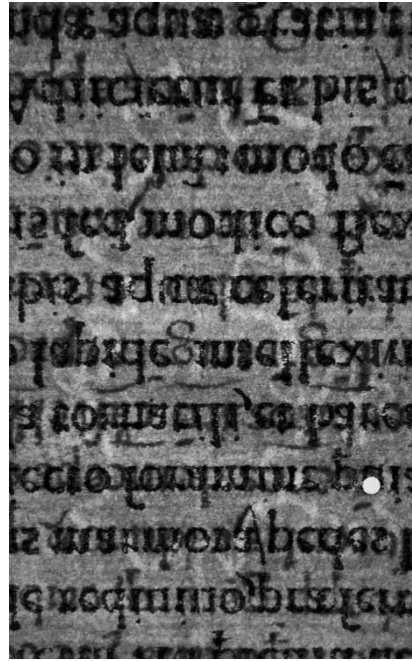


Fig. 129

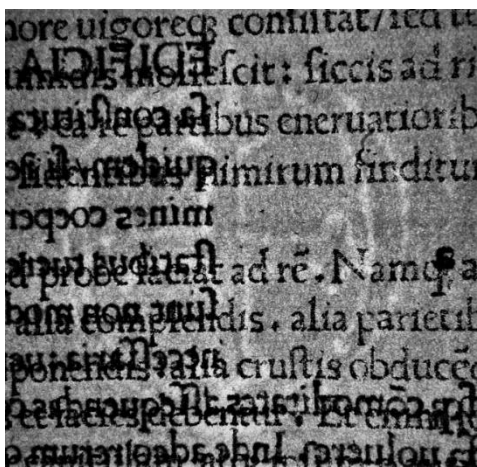


Fig. 130

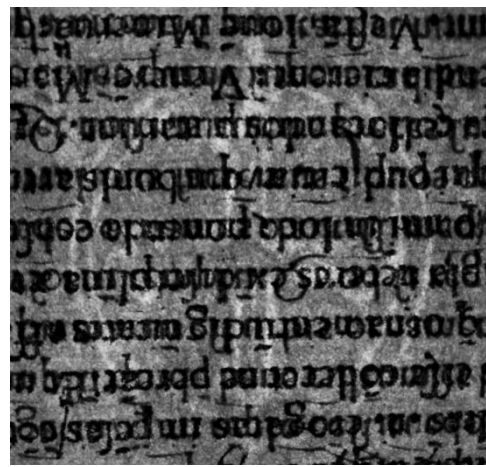


Fig. 131

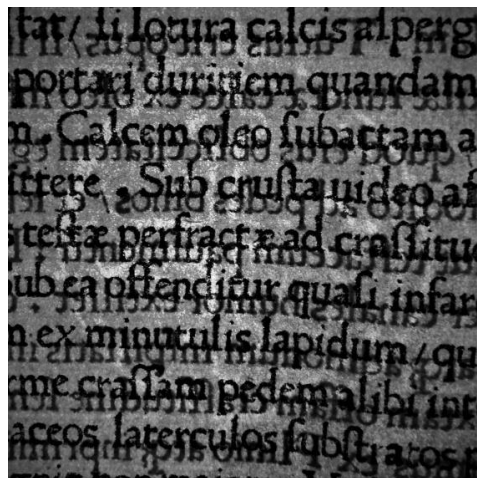


Fig. 132

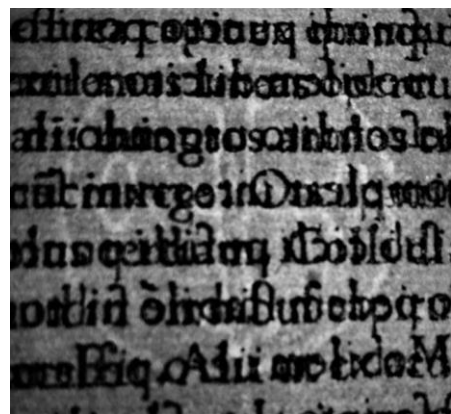


Fig. 133

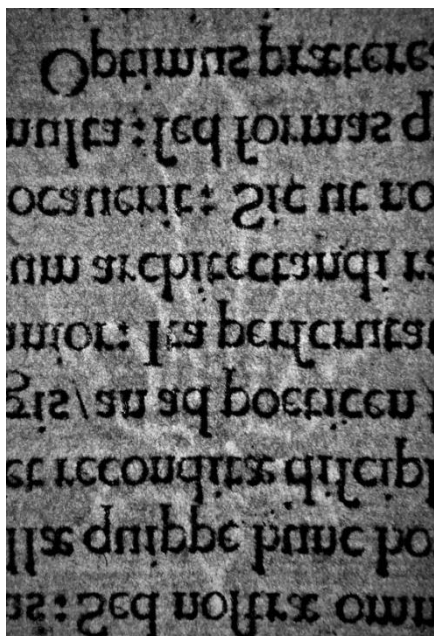


Fig. 134

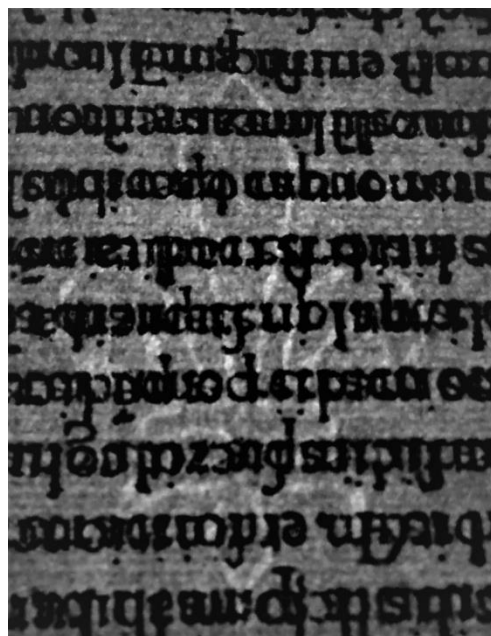


Fig. 135

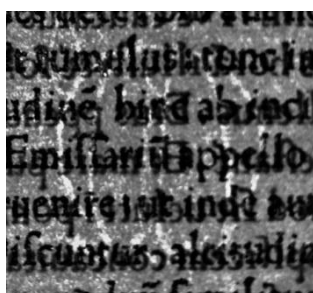


Fig. 136

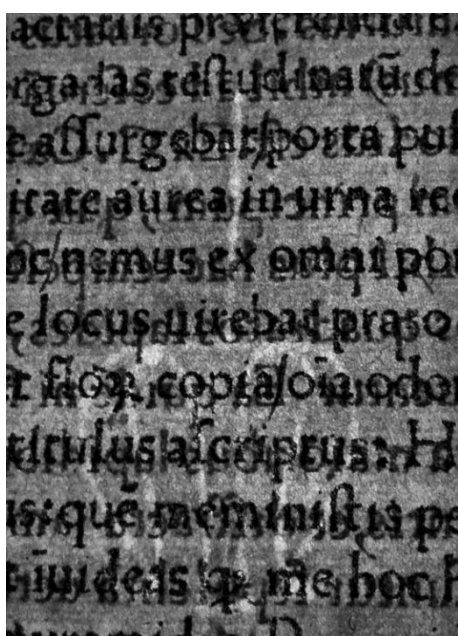


Fig. 137

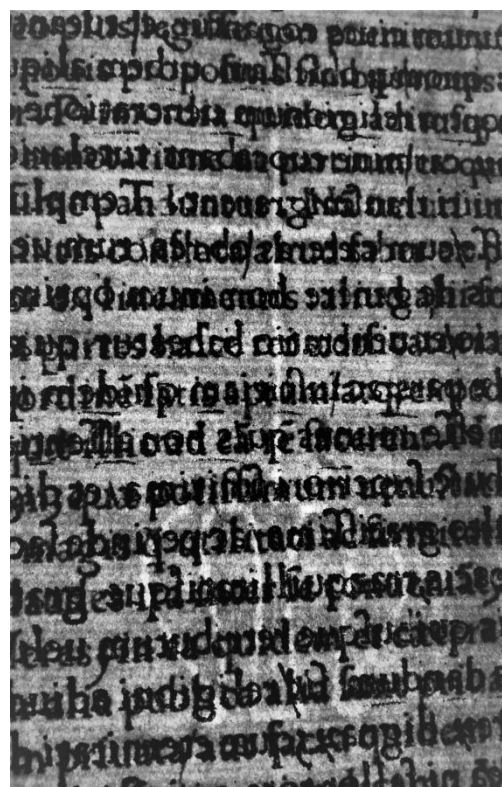


Fig. 138

318

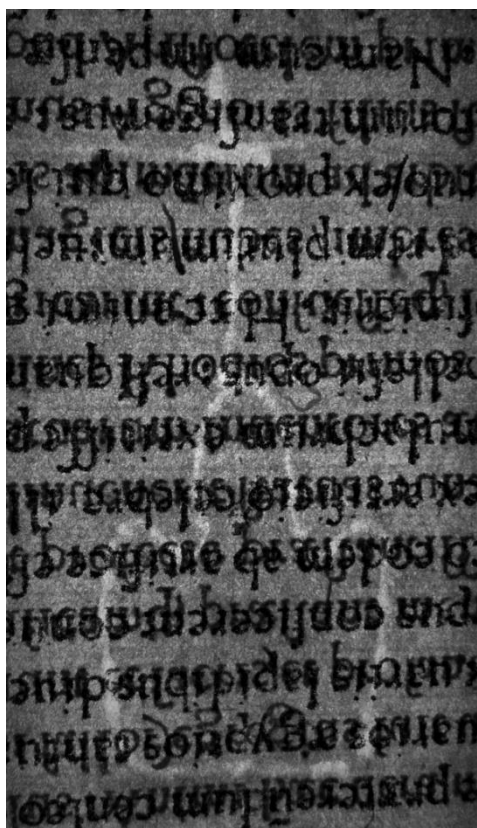


Fig. 139

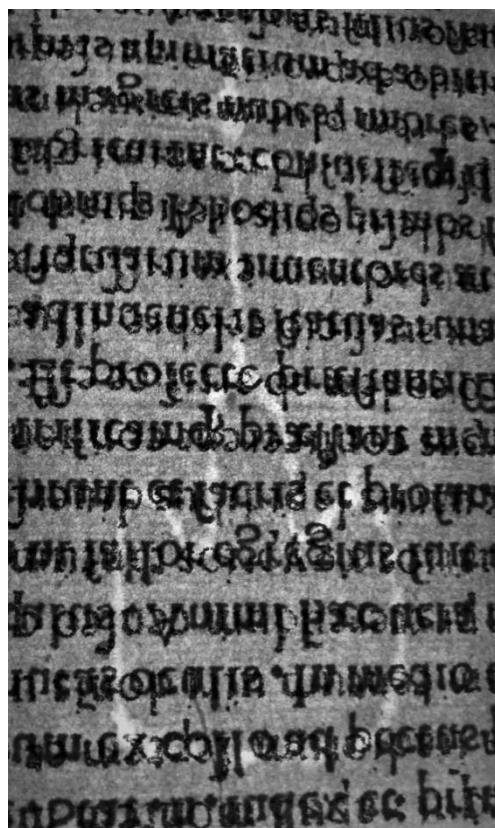


Fig. 140

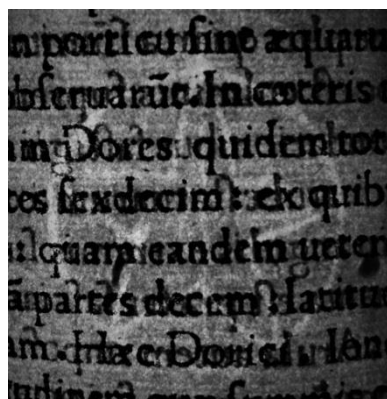


Fig. 141

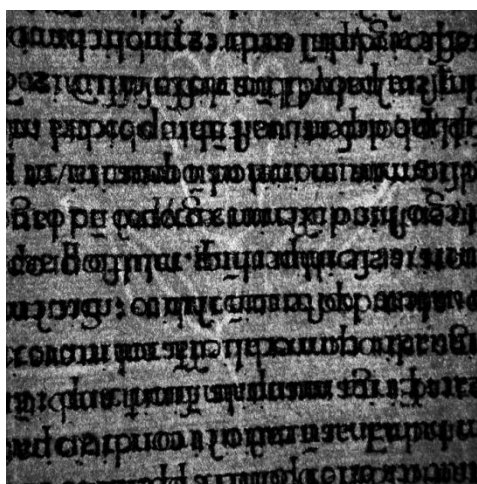


Fig. 142

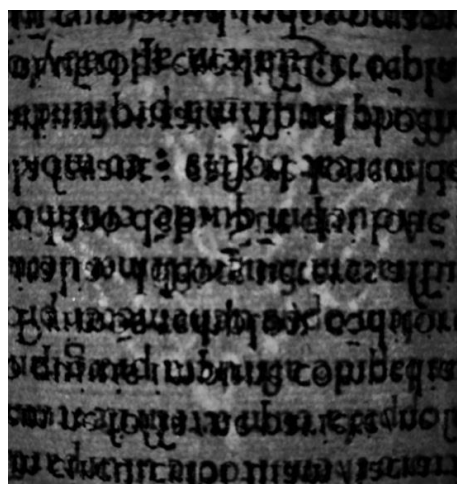


Fig. 143

Books printed in other printing offices in Florence from 1481 to 1487

Printing office Francesco di Dino

Confessionale

Antoninus

July 10, 1481

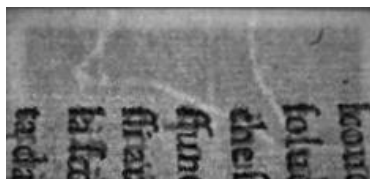


Fig. 144

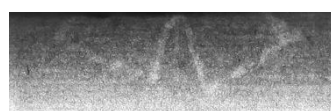
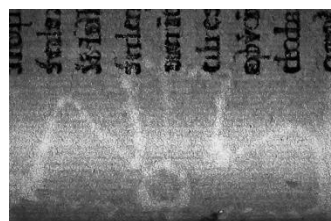


Fig. 145

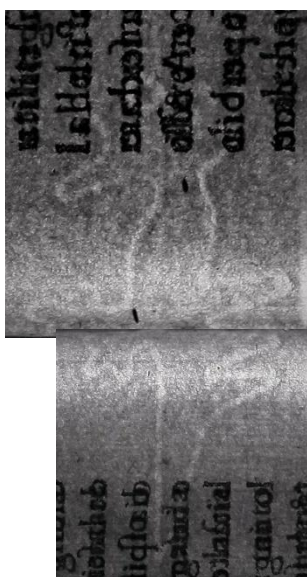


Fig. 146

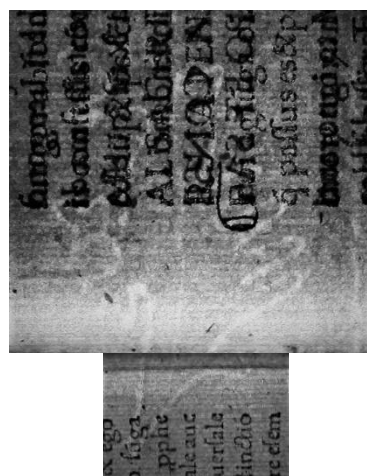


Fig. 147

Printing office San Jacopo di Ripoli

Plato

Ficino

May 1484, April 1485

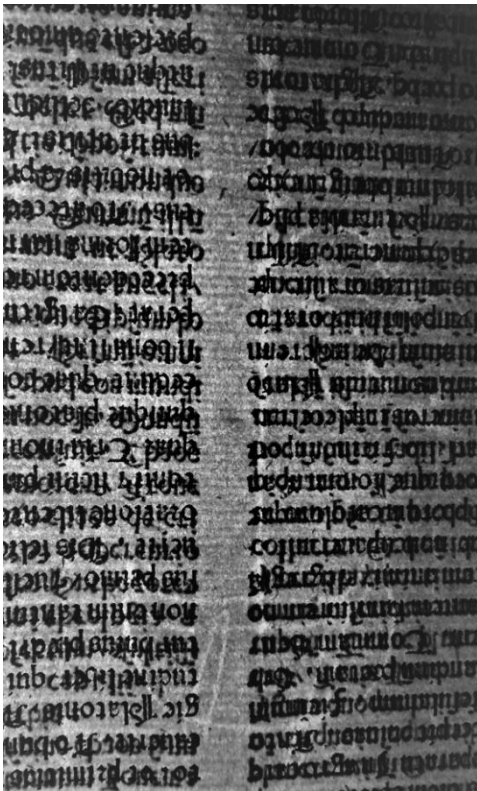


Fig. 148

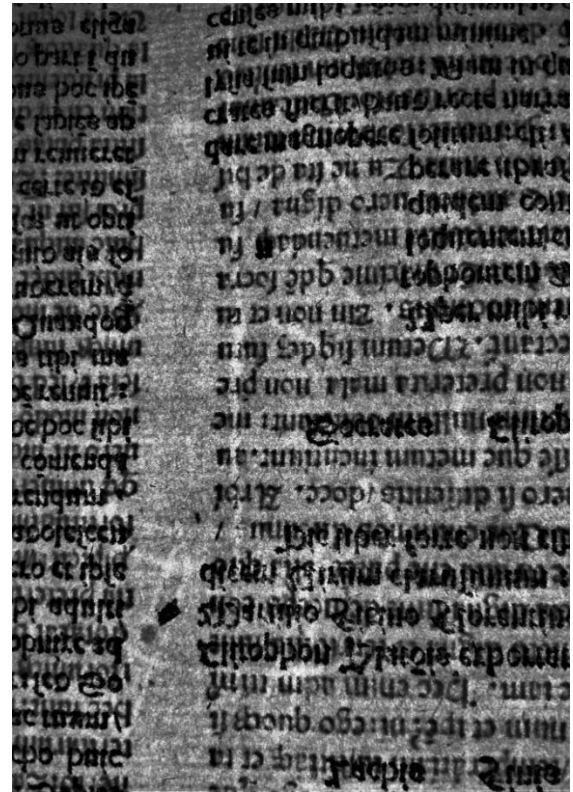


Fig. 149



Fig. 150

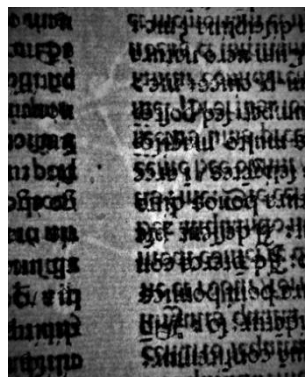


Fig. 151



Fig. 152

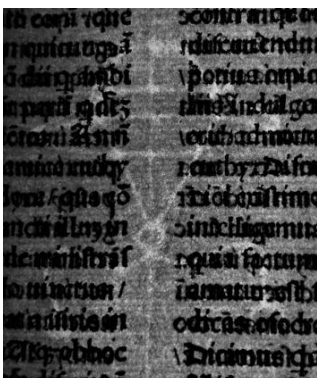


Fig. 153



Fig. 154

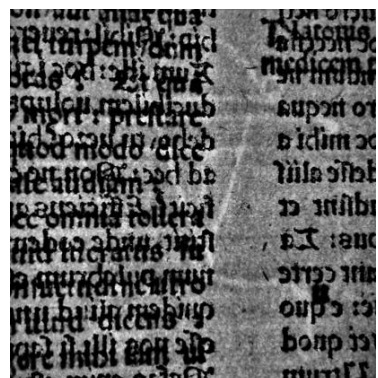


Fig. 155

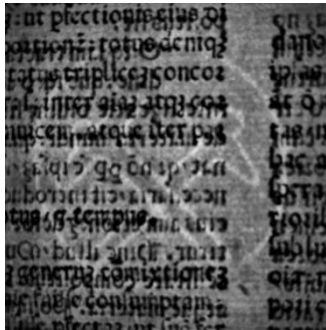


Fig. 156

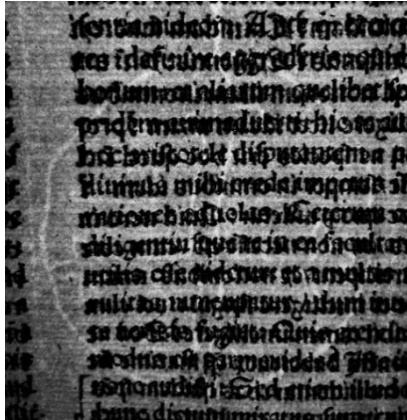


Fig. 157

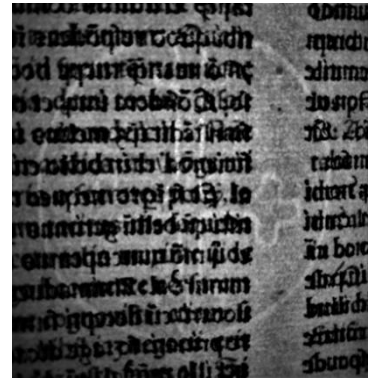


Fig. 158

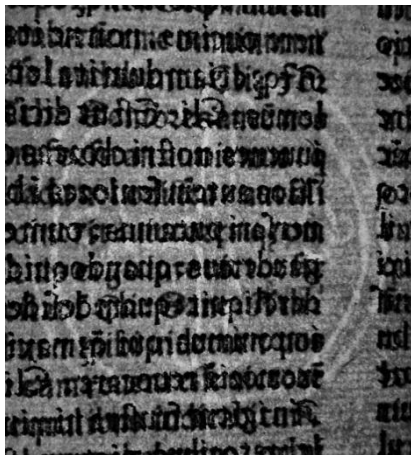


Fig. 159

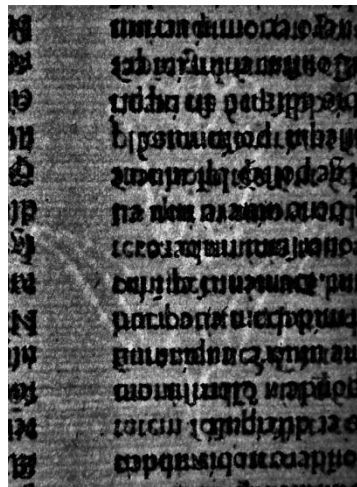


Fig. 160

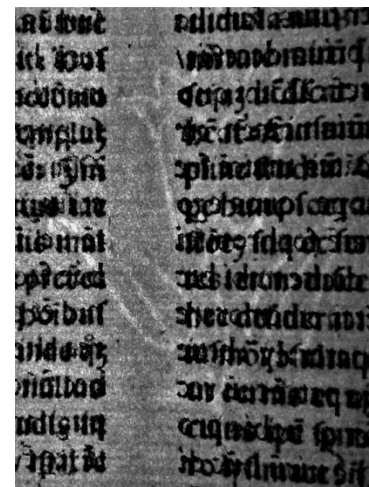


Fig. 161

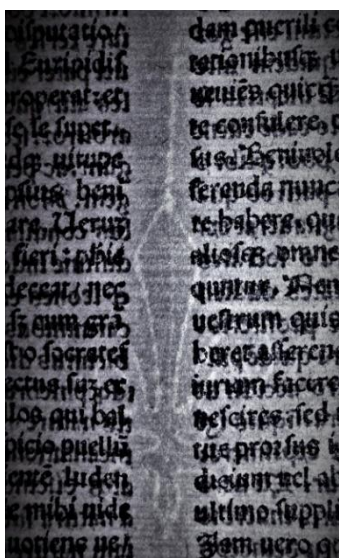


Fig. 162



Fig. 163

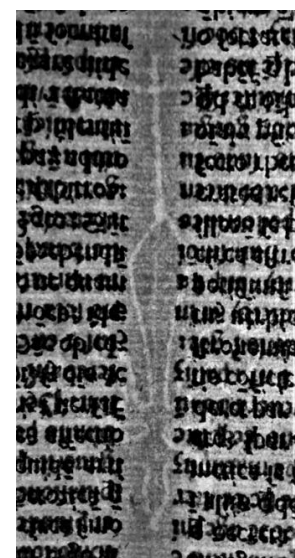


Fig. 164

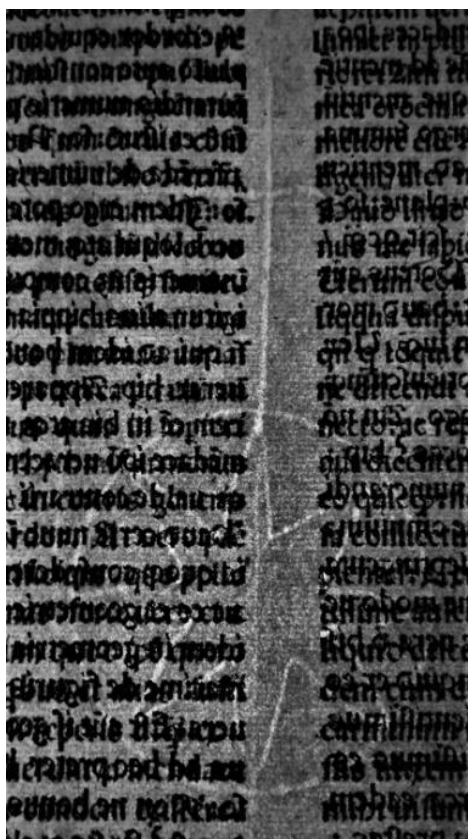


Fig. 165

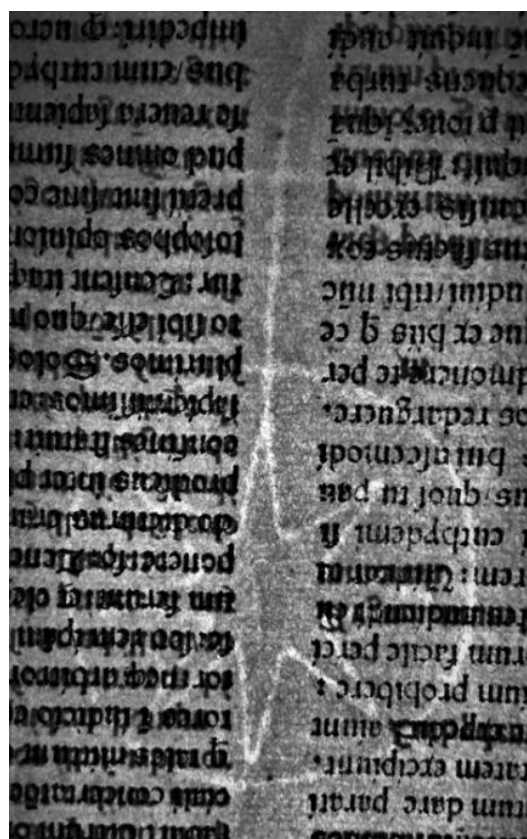


Fig. 166

Printing office Bartolomeo de Libri

Orationes Fontius after November 11, 1487



Fig. 167

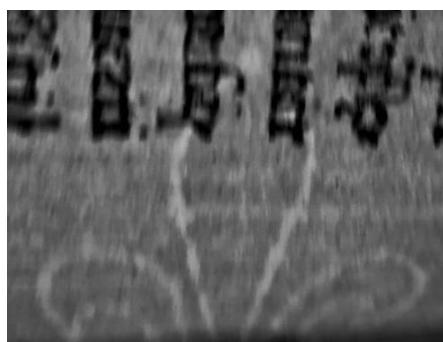


Fig. 168

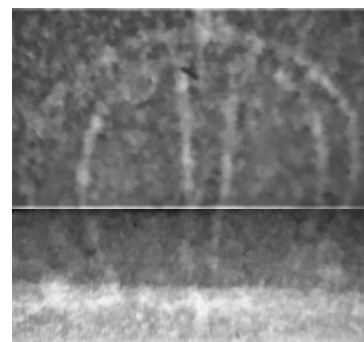


Fig. 169

Berlinghieri's Geography

The watermarks in the text leaves



Fig. 170



Fig. 171



Fig. 172

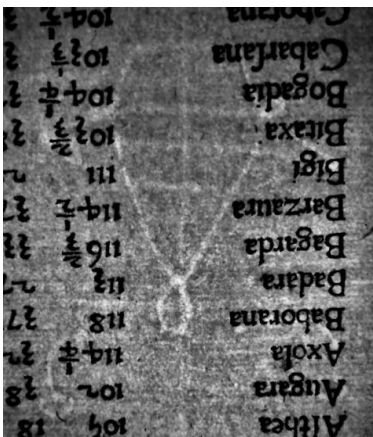


Fig. 173

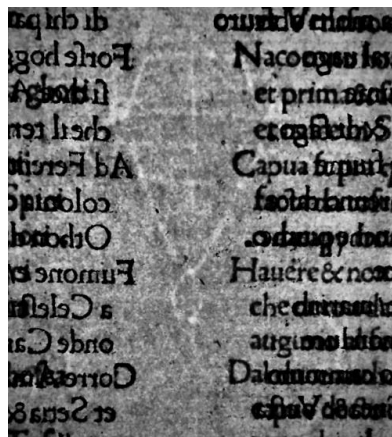


Fig. 174

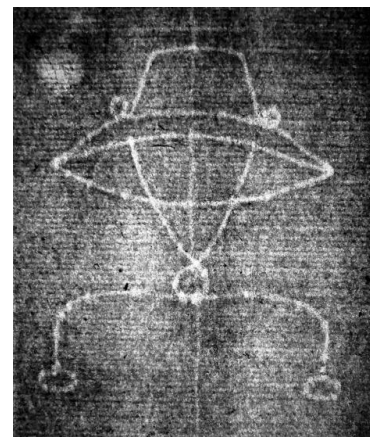


Fig. 175

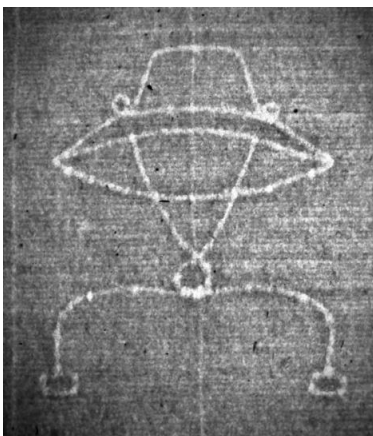


Fig. 176

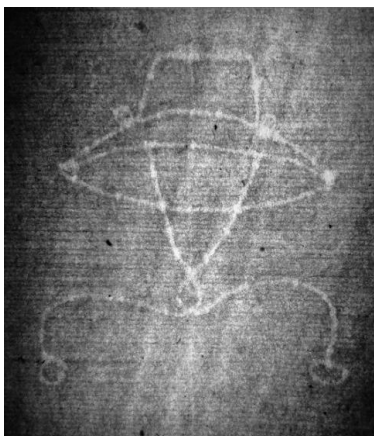


Fig. 177

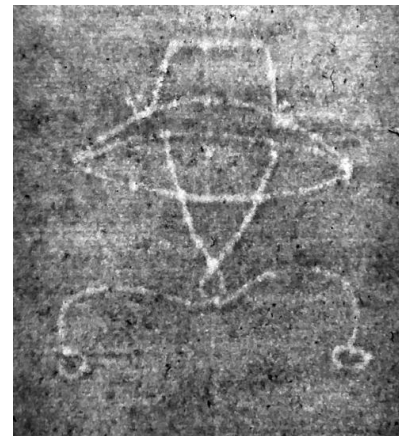


Fig. 178

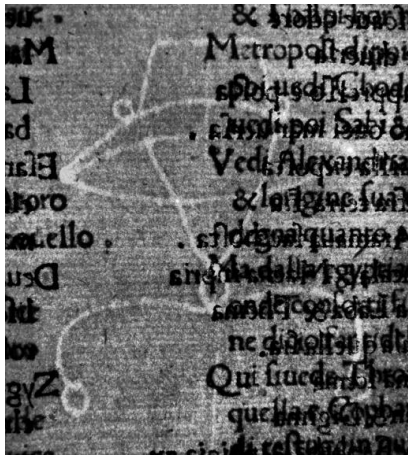


Fig. 179

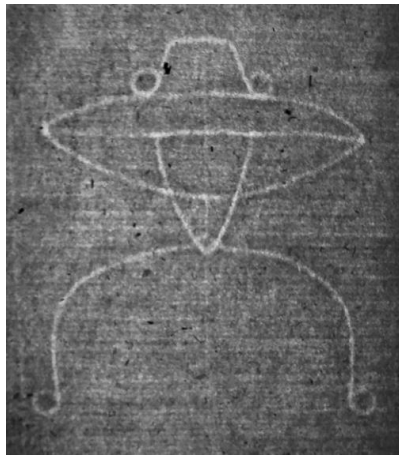


Fig. 180

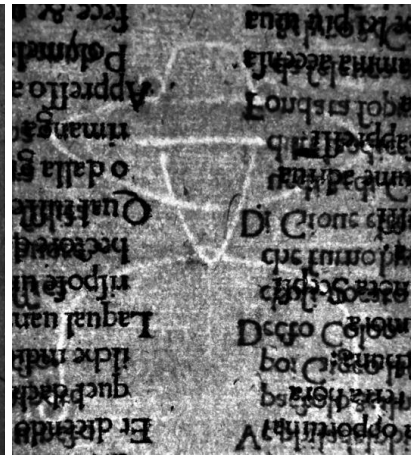


Fig. 181



Fig. 182

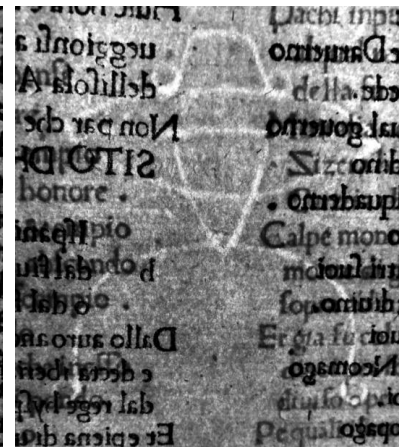


Fig. 183

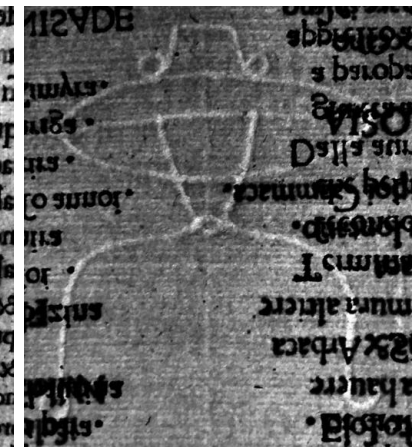


Fig. 184

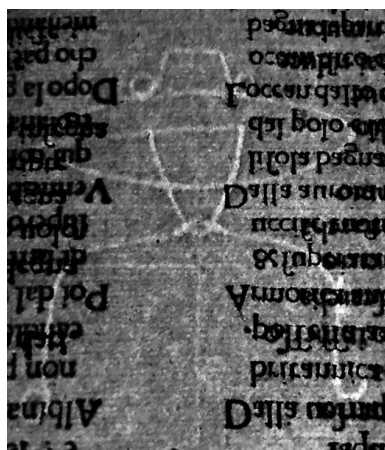


Fig. 185

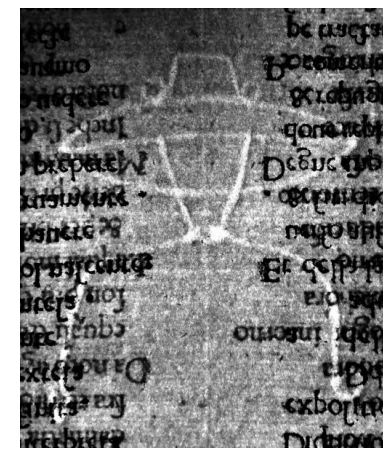


Fig. 186

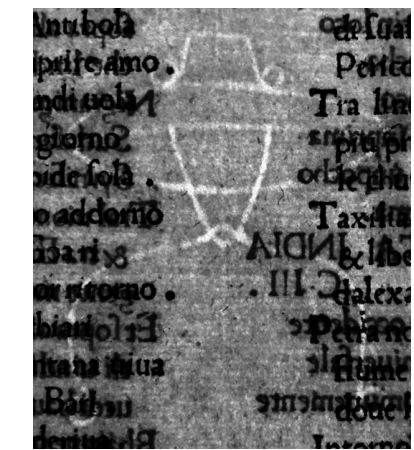


Fig. 187

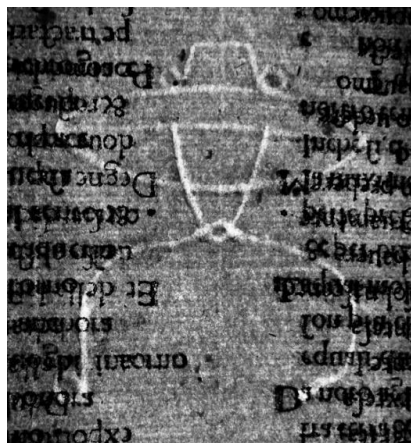


Fig. 188

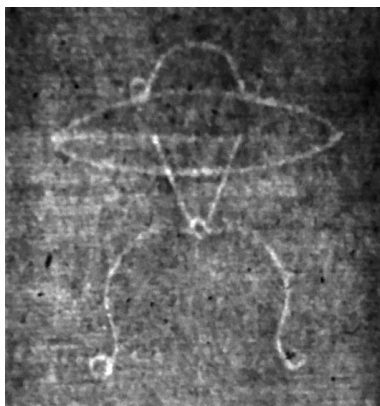


Fig. 189

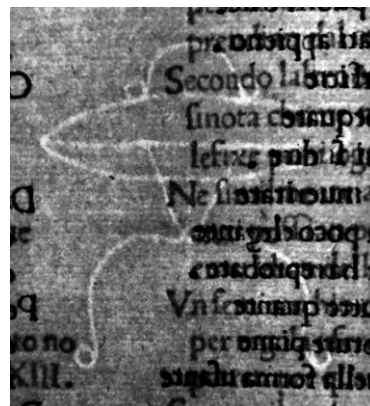


Fig. 190

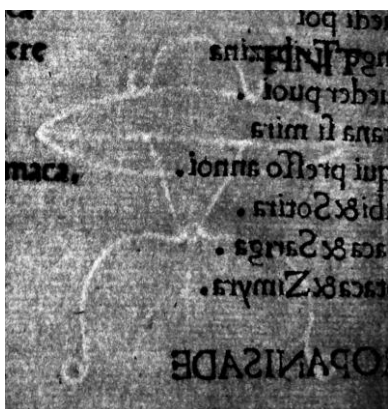


Fig. 191

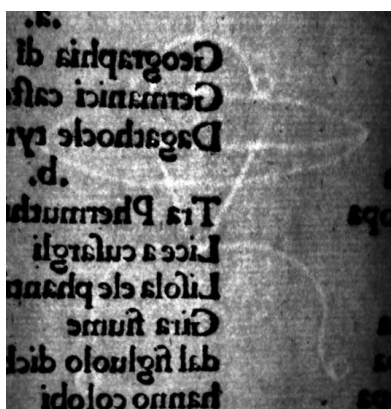


Fig. 192

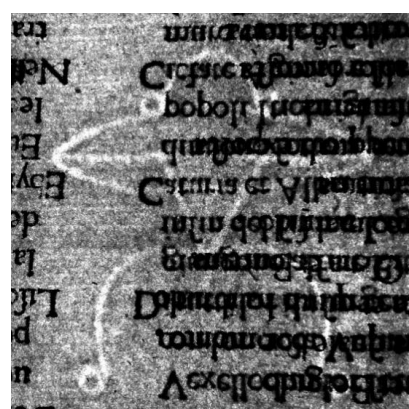


Fig. 193

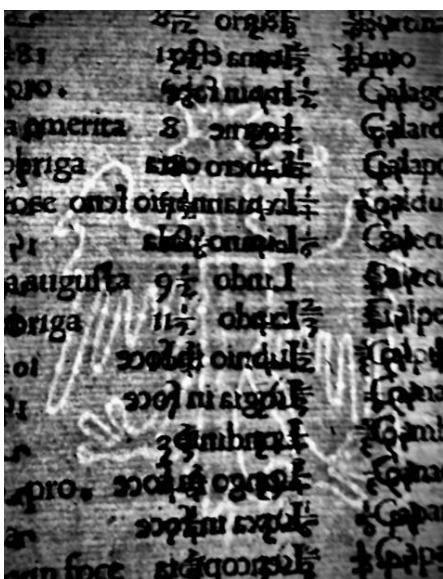


Fig. 194

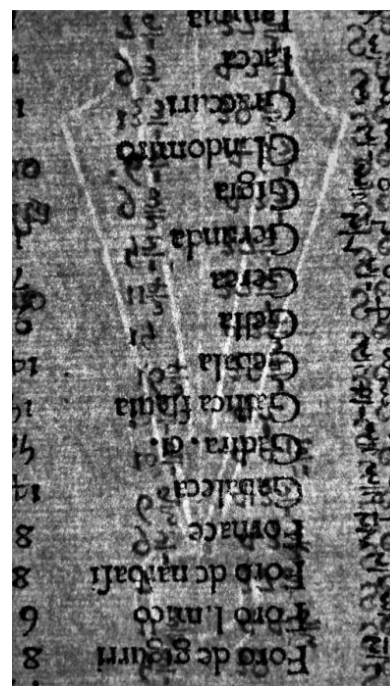


Fig. 195

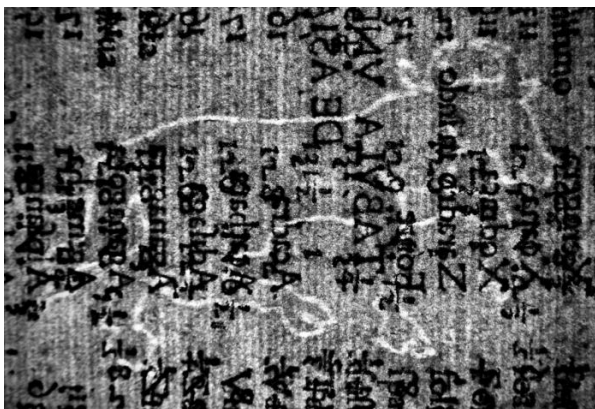


Fig. 196

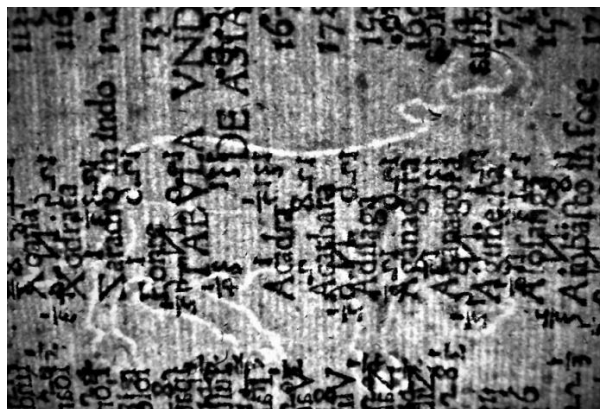


Fig. 197

The watermarks in the leaf with the register and colophon

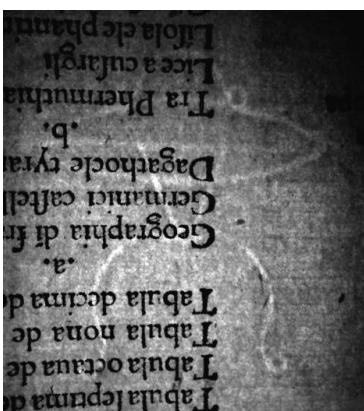


Fig. 198

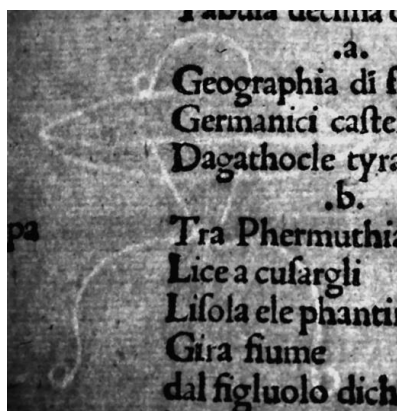


Fig. 199

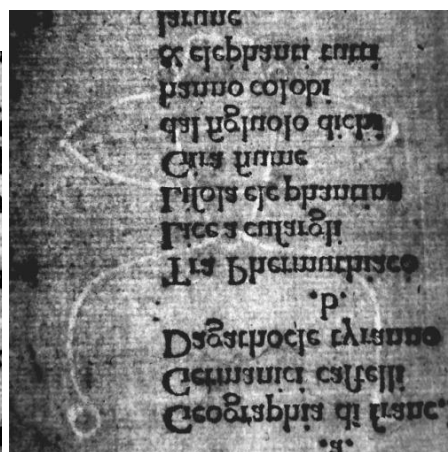


Fig. 200

The watermarks in the fly leaves



Fig. 201



Fig. 202

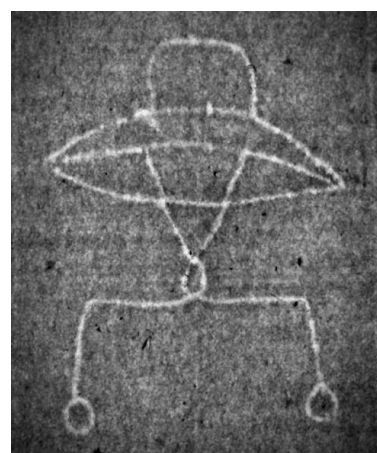


Fig. 203

The watermarks in the interleaves placed by Tedesco



Fig. 204



Fig. 205



Fig. 206

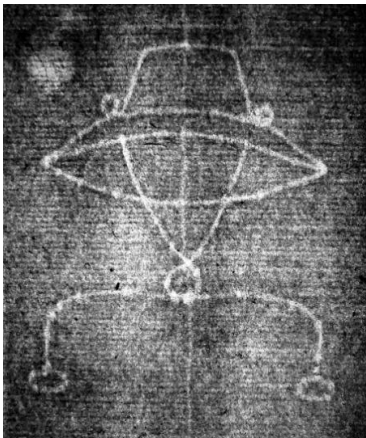


Fig. 207

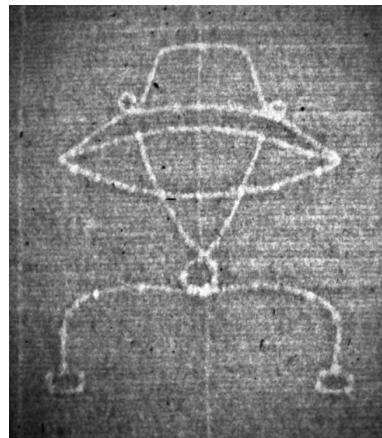


Fig. 208

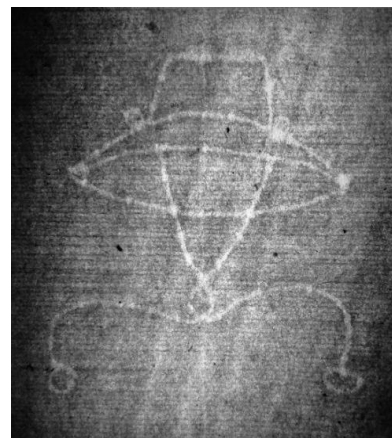


Fig. 209



Fig. 210

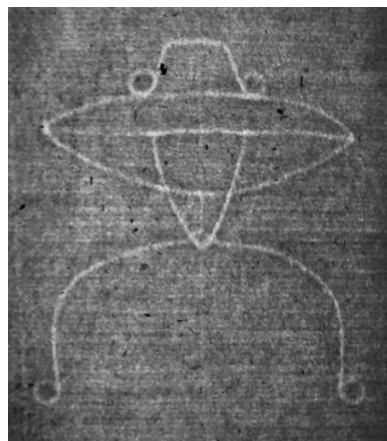


Fig. 211



Fig. 212

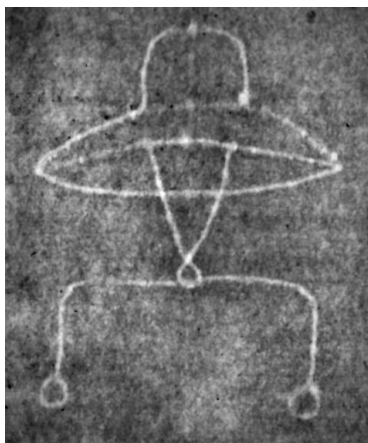


Fig. 213

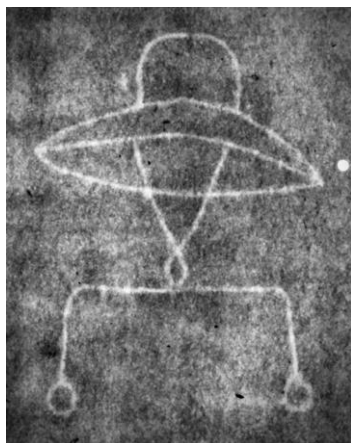


Fig. 214



Fig. 215

The watermarks in the interleaves placed in a workshop or by the bookbinder

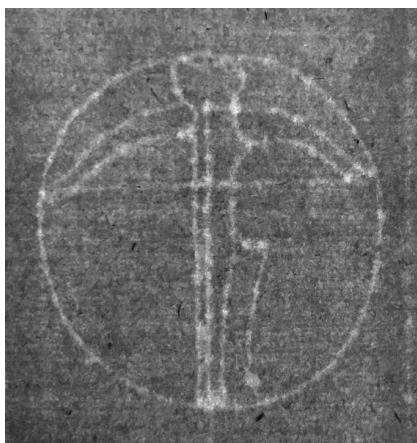


Fig. 216



Fig. 217

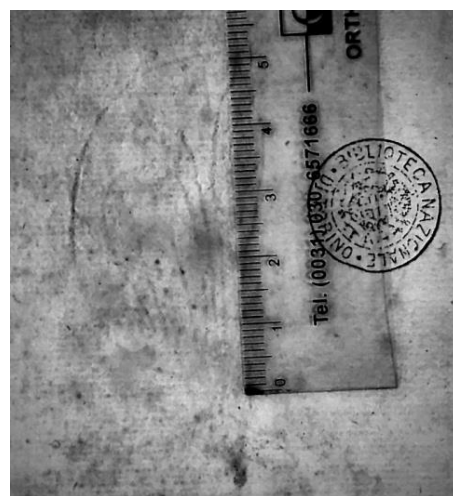


Fig. 218

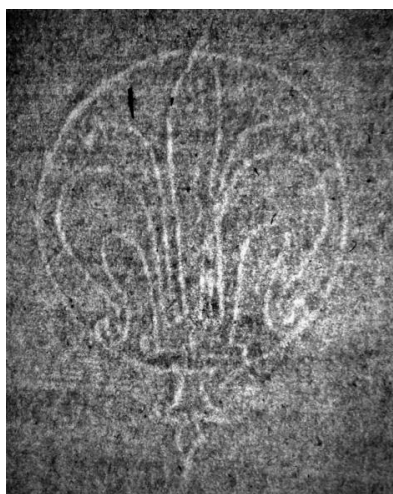


Fig. 219



Fig. 220



Fig. 221

The watermarks in the sheets with the maps

First edition first printing phase



Fig. 222

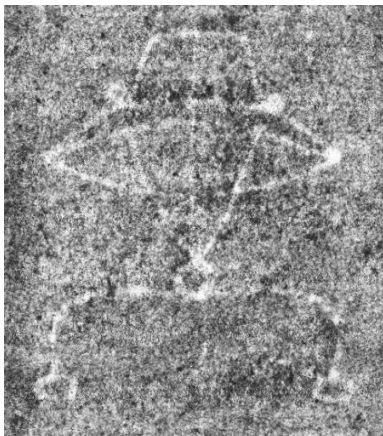


Fig. 223

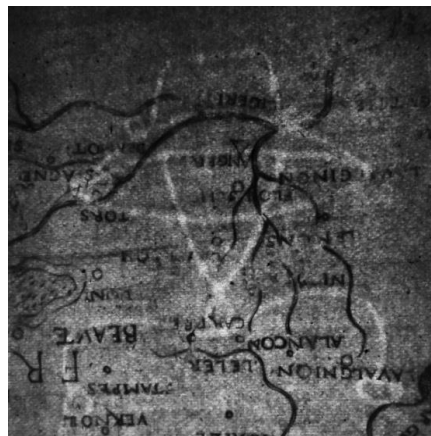


Fig. 224

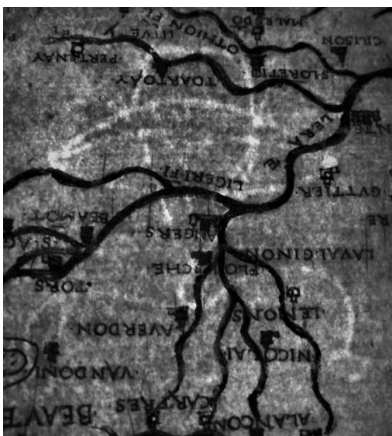


Fig. 225

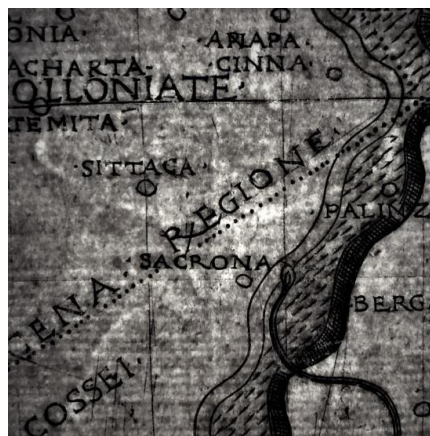


Fig. 226



Fig. 227



Fig. 228

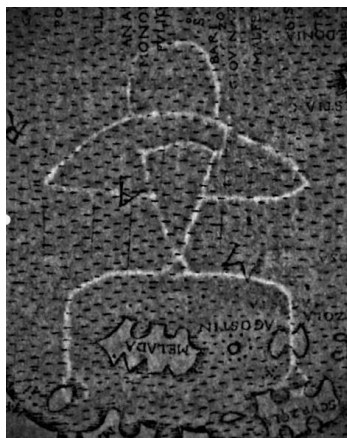


Fig. 229



Fig. 230

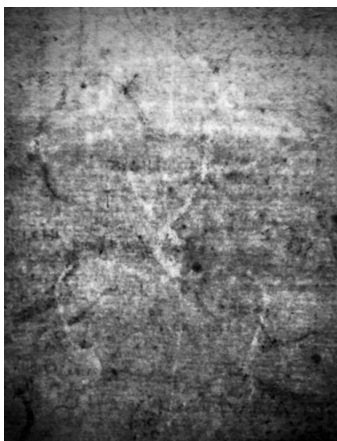


Fig. 231

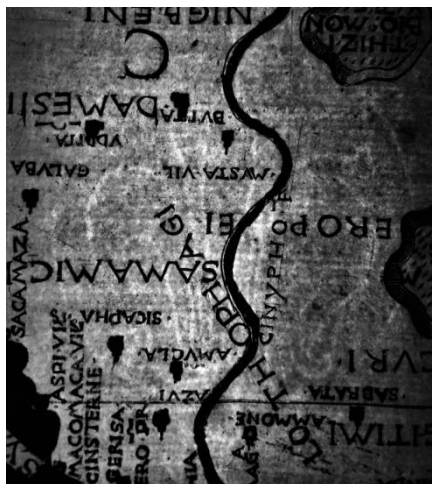


Fig. 232



Fig. 233

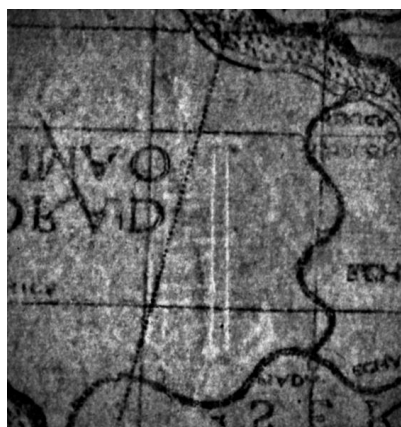


Fig. 234

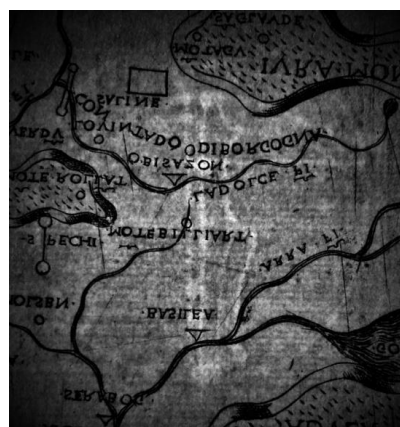


Fig. 235



Fig. 236



Fig. 237

First edition second printing phase



Fig. 238

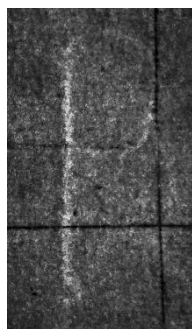


Fig. 239

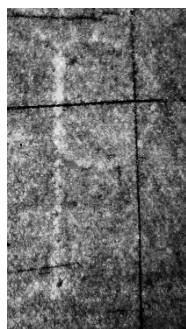


Fig. 240

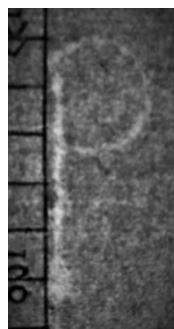


Fig. 241

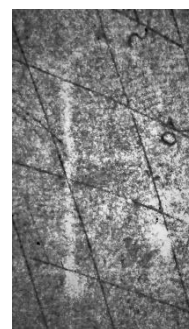


Fig. 242

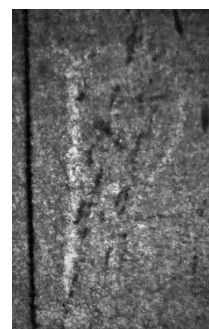


Fig. 243

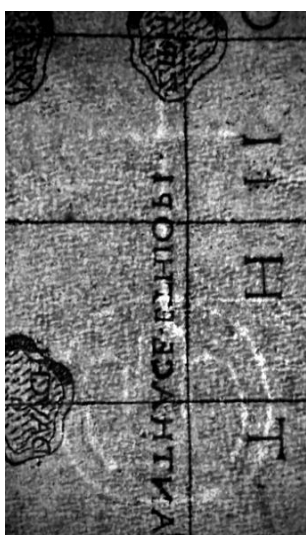


Fig. 244



Fig. 245



Fig. 246

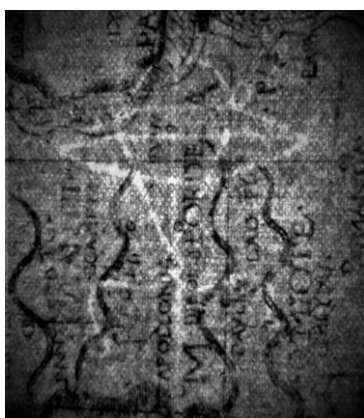


Fig. 247



Fig. 248



Fig. 249

Second edition printed by Giunti

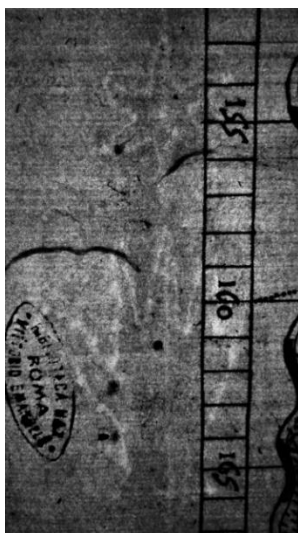


Fig. 250



Fig. 251

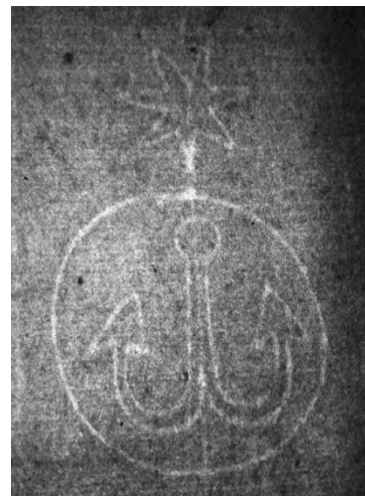


Fig. 252



Fig. 253

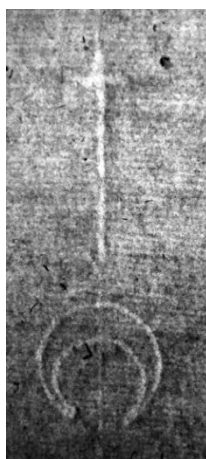


Fig. 254

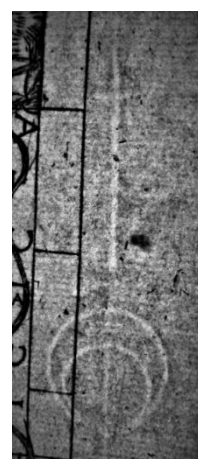


Fig. 255

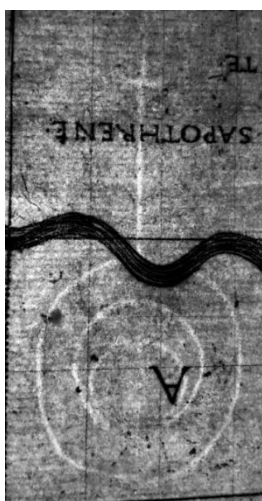


Fig. 256

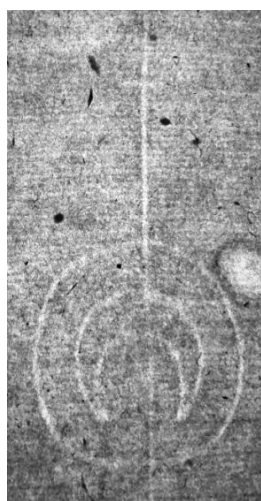


Fig. 257



Fig. 258



Fig. 259



Fig. 260



Fig. 261

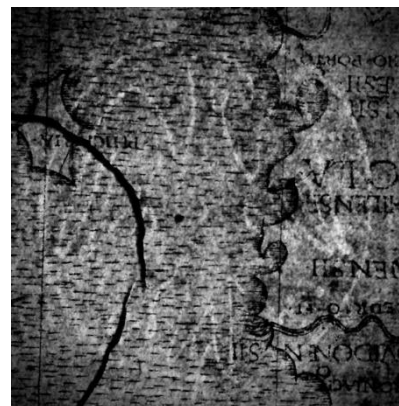


Fig. 262



Fig. 263



Fig. 264



Fig. 265

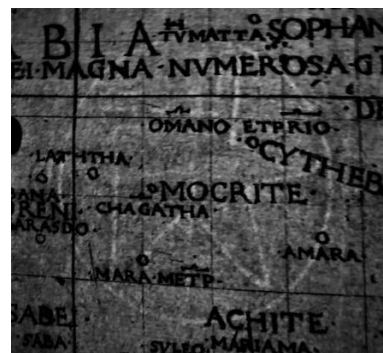


Fig. 266



Fig. 267



Fig. 268

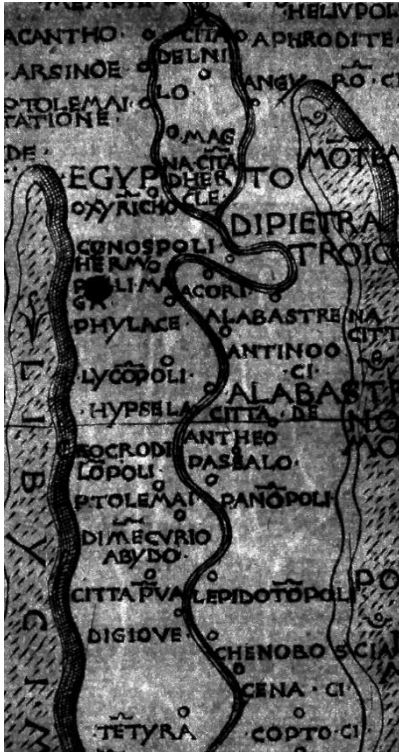


Fig. 277

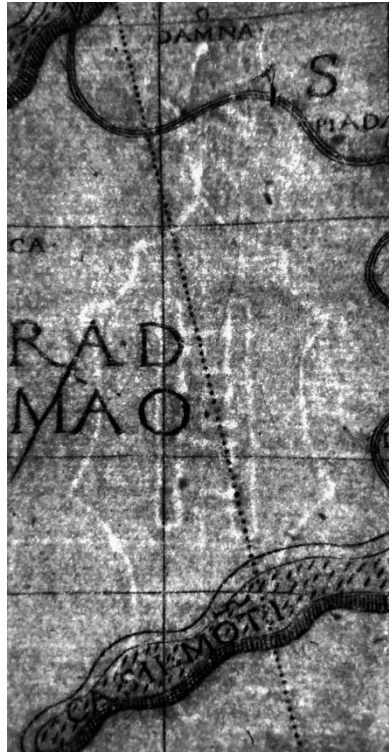


Fig. 278



Fig. 279

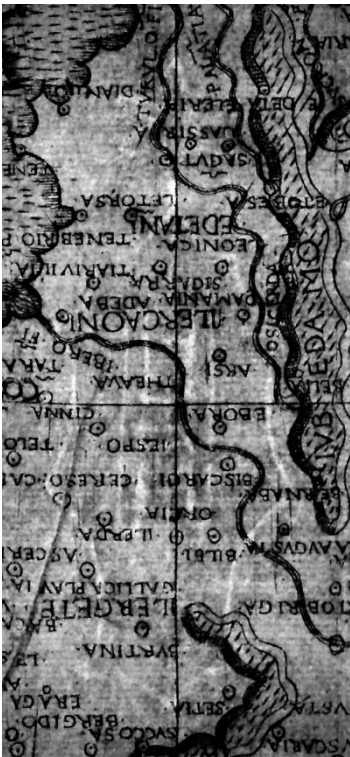


Fig. 280

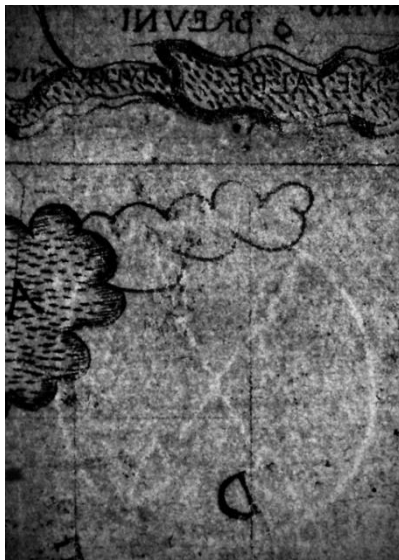


Fig. 281



Fig. 282

Watermarks in the leaves the first edition maps are backed with



Fig. 283

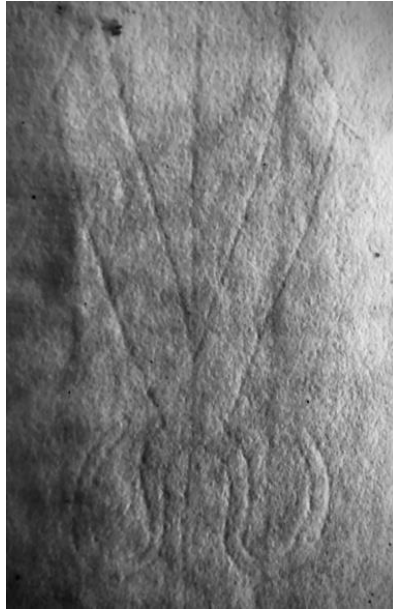


Fig. 284



Fig. 285



Fig. 286

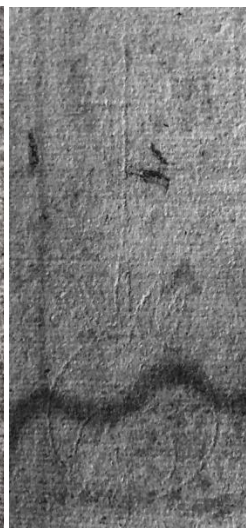


Fig. 287

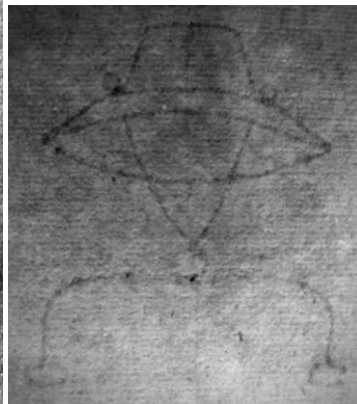


Fig. 288



Fig. 289



Fig. 290



Fig. 291

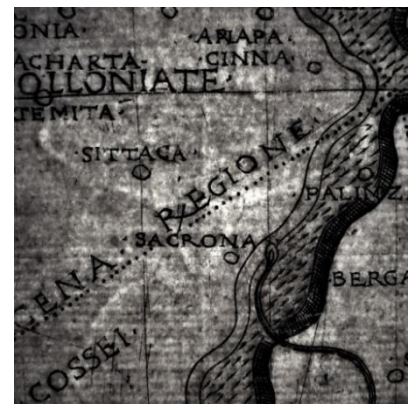


Fig. 292

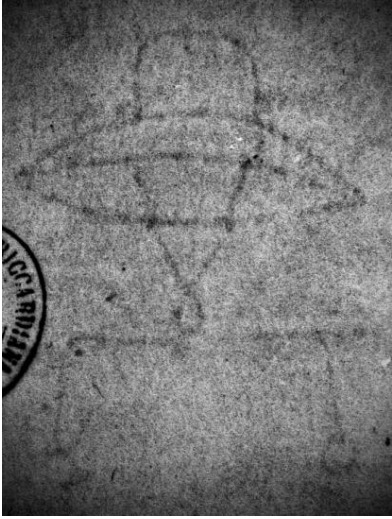


Fig. 293



Fig. 294

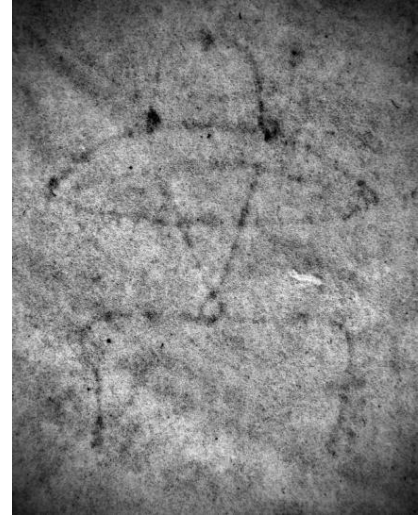


Fig. 295



Fig. 296



Fig. 297



Fig. 298



Fig. 299



Fig. 300



Fig. 301



Fig. 302



Fig. 303



Fig. 304



Fig. 305



Fig. 306



Fig. 307



Fig. 308



Fig. 309



Fig. 310



Fig. 311



Fig. 312

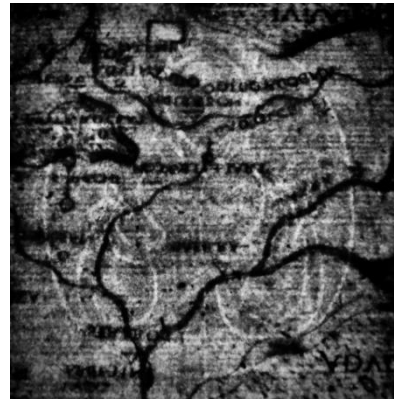


Fig. 313



Fig. 314



Fig. 315



Fig. 316

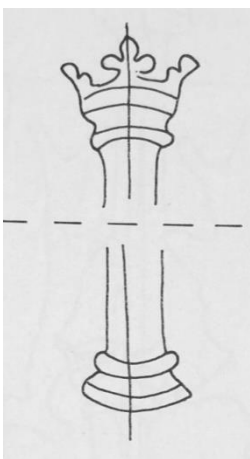


Fig. 317



Fig. 318



Fig. 319

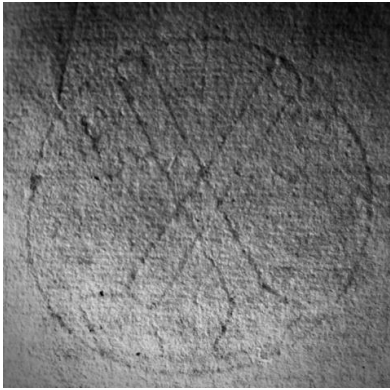


Fig. 320



Fig. 321

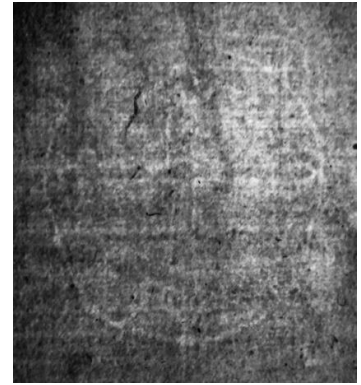


Fig. 322



Fig. 325

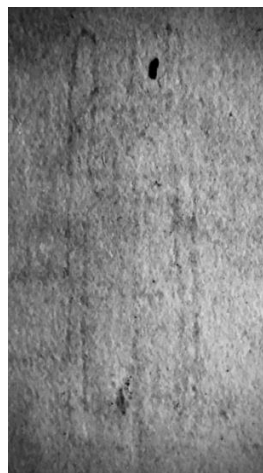


Fig. 326



Fig. 323

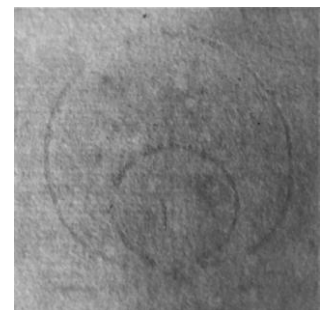


Fig. 324



Fig. 327

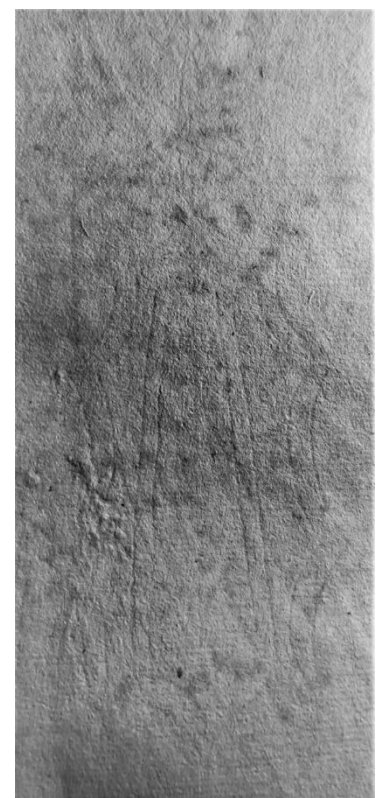


Fig. 328

**The watermarks in the leaves of the maps and their backings superimposed
first edition first printing phase**

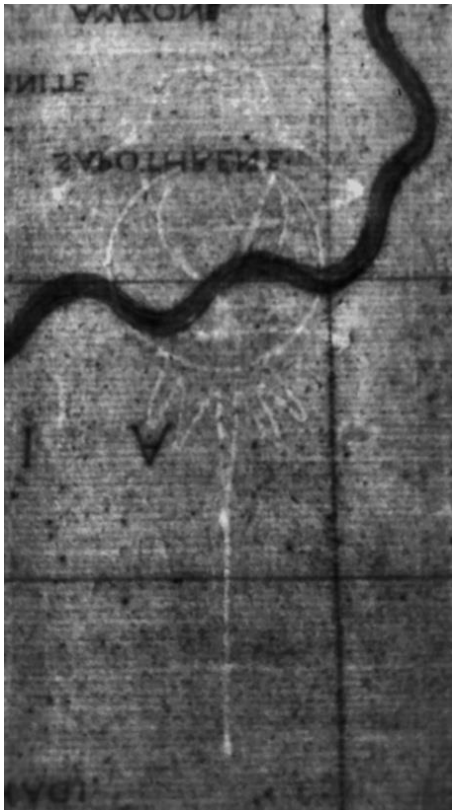


Fig. 329



Fig. 330



Fig. 331



Fig. 332

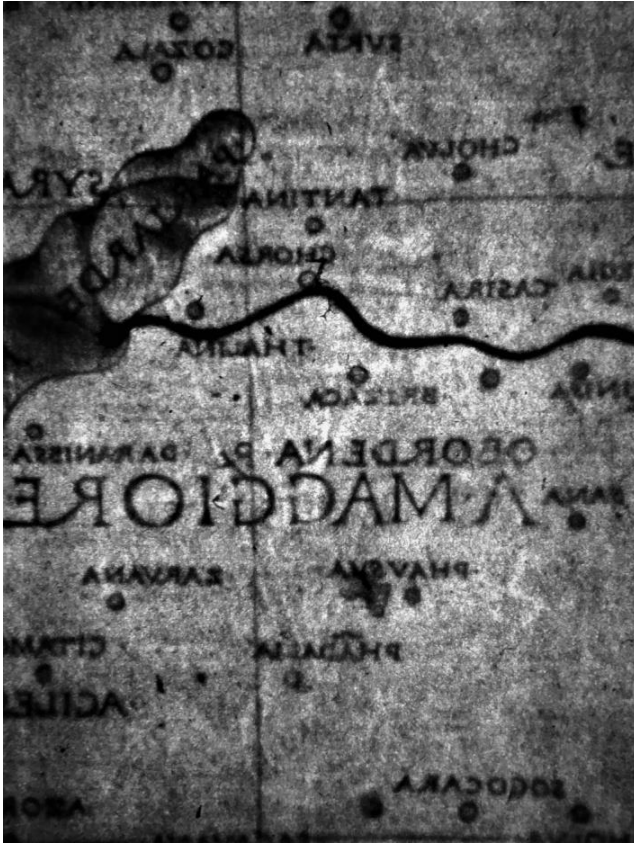


Fig. 333

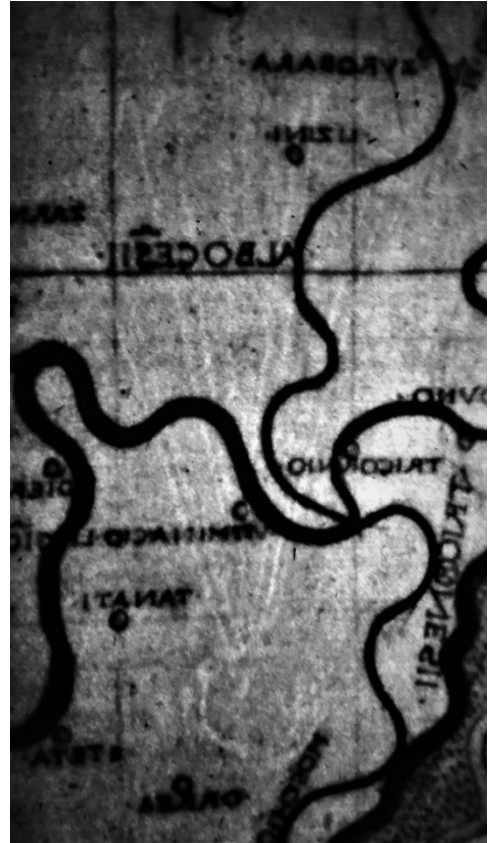


Fig. 334

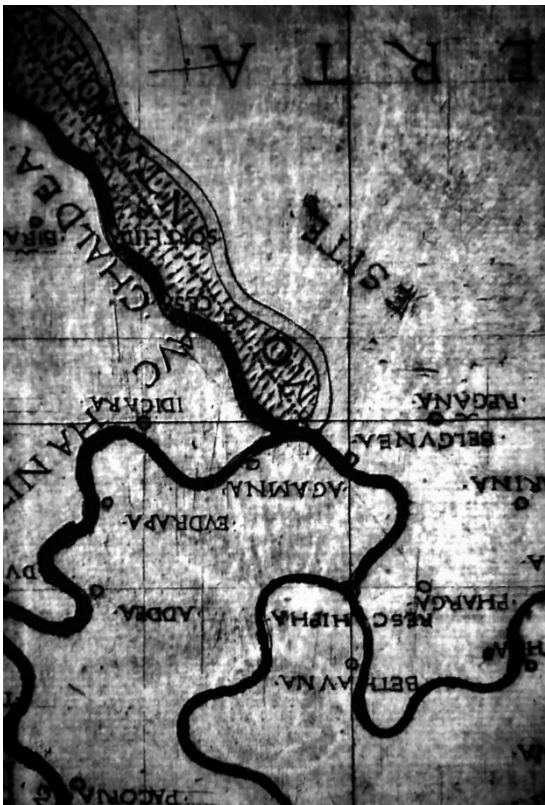


Fig. 335



Fig. 336

**The watermarks in the leaves of the maps and their backings in one half of a map
first edition second printing phase**



Fig. 337



Fig. 338

CHAPTER 5

Berlinghieri's Geography: the printed text

Introduction

The existing literature about the *Geography* and our pilot study taught us that a lot of issues remained to be explored and explained in relation to Berlinghieri's project. As we had already gained some experience in researching the different editions of the Rome *Cosmography*, we decided to focus on the watermarks present in the paper again. The other objects of study were the text pages, the maps, and the used fonts.¹ To solve the mystery of a printed book, one needs to integrate all findings. The FBI or Scotland Yard do not rely solely on poisons, ballistics, fingerprints, or DNA, but try to integrate all these possible forms of evidence.² We hoped and expected to find answers to the questions and problems mentioned in the preface by integrating the findings from the various features studied. We aim to present our findings as clearly and logically as possible, in an orderly fashion. We discovered that the process of creating Berlinghieri's *Geography* was much more complex to explain in comparison with the different editions of the Rome *Cosmography*. Researching the *Geography* was a voyage of discovery during which its secrets were revealed. Now that we think we understand the underlying structure, we will present our findings about the text step by step in this chapter. The results will be discussed and explained with the help of photos. We will start this chapter by describing the composition of the *Geography*. Next, the findings concerning the printed text and print characteristics will be presented. The text pages of nineteen copies were compared, mainly page by page, and some parts letter by letter. Special attention will be paid to our findings concerning the headers. Together with the results regarding the watermarks in the text pages and gazetteers, we were able to establish the chronology, the printing sequence and logistics of printing. Lastly, the page with the register and colophon will receive some special attention.

Composition and collation

The printed version of Berlinghieri's *Geography* has a title printed in black on the verso of the first leaf. Originally, the recto side of this leaf was left blank for illumination. An additional title, printed in red, is present on the recto of this first leaf in many extant copies. Sheets of royal sized paper must have been cut in half to print the text pages as a watermark was found in only half of the text leaves. The leaf with the title is followed by two preliminary leaves. The recto of the first shows an index of regions and larger islands. On the verso of this leaf, we find an introductory note from Berlinghieri, in which he dedicates the *Geography* to Federico da Montefeltro, Duke of Urbino. The second preliminary leaf contains, recto and verso, a verse addressed to Federico. On the verso, this leaf ends with the *apologus* of Marsilio Ficino to Federico.³ Then, the seven main books or so-called *Liber*s follow.⁴ Except for *Liber Primus*, every *liber* has a 'gazetteer' or a list of places with coordinates.⁵ Each one contains the toponyms

¹ There is some discussion about the fonts used for the title page in red and the register between Skelton and Veneziani described in the previous chapter; Claudius Ptolemaeus, *Francesco Berlinghieri Geographia Florence 1482*, with an introduction by Raleigh A. Skelton (Amsterdam 1966), p. IX; Paolo Veneziani, 'Vicende tipografiche della *Geografia* di Francesco Berlinghieri', *La Bibliofilia*, 84, (1982), p. 206.

² Stevenson solved the question regarding the year of printing of the *Missale Speciale* by studying the fonts, the paper, and the watermarks. He concluded that a scholar should not rely on typographical, or paper evidence alone: Allan Stevenson, *The problem of the Missale Speciale* (London 1967), pp. 69-70.

³ Skelton, op. cit. (n. 1), p. VI; Veneziani, op. cit. (n. 1), pp. 201-2; The page with the title and the two preliminary leaves are printed with font 111 R^a.

⁴ Skelton, op. cit. (n. 1), p. VI; The text of *Liber Quartus* up to and including *Liber Septimus*, as well as the text of *Liber primus* until halfway *Liber Secundus*, is printed with font 115 R^a. The text of the second half of *Liber Secundus* and *Liber Tertius* is printed with font 115 R^b.

⁵ *Ibid*, p. VI; They are based on the lists in *Liber Secundus* up to and including *Liber Septimus* of Ptolemy's *Cosmography*.

in alphabetical order.⁶ Following Liber Secundus, Tertius, Sextus, and Septimus, a blank interleaf is placed. Each gazetteer is followed by the maps related to them as follows: after Liber Secundus, Europa I-V including the modern maps of Spain and France, after Liber Tertius Europa VI-X and the modern map of Italy, after Liber Quartus Africa I-IV, after Liber Quintus Asia I-IV together with the modern map of Palestine, after Liber Sextus Asia V-IX, and finally after Liber Septimus Asia X-XII.⁷ The world map is positioned in front of the map Europa I. This division is specific for Berlinghieri and is not found in any other version of the *Cosmography*. In copies with the additional title in red, a leaf with the register and the colophon is present following the last map.⁸

To prevent confusion, we would now already like to introduce the existence of two editions of Berlinghieri's *Geography*. The first edition has the title printed in black on the verso of the first leaf. The maps for the first edition atlases were printed in two different print runs. The second edition is characterized by the addition of a frontispiece printed in red on the recto of the first leaf and of a leaf with the register and colophon. The maps for this second edition were supplementary printed by Giunti some forty years later.⁹

Skelton described the composition of Berlinghieri's *Geography* as follows: two preliminary leaves (unsigned), 124 leaves of text (in fifteen signed and two unsigned quires), and thirty-one maps on thirty folded sheets not gathered in quires, without signatures at the end of each Liber to which they refer in the following collation; Folio []² aa¹⁰ bb-dd⁸ ee⁶ ff-gg⁸ hh⁶ ii⁴; a⁶ b⁸ + ² c-d⁸ []⁴ e⁸ []⁴ f¹⁰. As required by the register on sig. f10^r, eight map sheets should be bound after sig. dd; six after sig. ii; four after sig. b; five after sig. d; four after sig. e; and three after sig. f. The following leaves are blank (recto and verso): sig. dd⁸, ii⁴, and the fourth (last) leaf of the unsigned quire subsequent to sig.e. Also blank: verso of the third leaf of the unsigned quire consecutive to sig.e, fol. f 10^v, and (in states A and B) recto of the first leaf of the unsigned preliminary quire.¹⁰

We have some reservations with the collation described by Skelton. All the atlases studied were found to be re-bound. We did not encounter a single atlas in its original binding. Regularly, blank leaves were found in front of the leaf with the title. In most cases they contain watermarks from the seventeenth or eighteenth century or even later. We detected only two examples with contemporary fly leaves in front of the leaf with the title.¹¹ In these copies, all four blank interleaves were found as well. Therefore, it is reasonable to assume that fly leaves must have been present in front of the leaf with the title in addition to the collation described above. We assume that there also will have been protective leaves at the end of each atlas, even though we did not find them.¹² They have probably been lost due to damage or because of rebinding. The same applies to the leaf with the title, as well as the one with the register and colophon. They were also regularly found missing or damaged in the copies studied. Veneziani described that three blank interleaves were included.¹³ These interleaves were found directly following the gazetteer of Liber Secundus, Tertius, and Sextus. We found another double blank interleaf, directly following the gazetteer of Liber Septimus, in several atlases. Skelton assumes that at a certain moment the register and colophon were printed on the recto of this fourth double blank leaf, directly following Liber Septimus.¹⁴

⁶ Ibid, p. VI; The text in all the gazetteers is printed with font 115 R^b.

⁷ Ibid, p. VI.

⁸ Ibid, p. VII.

⁹ This will be made clear step by step in this and the next two chapters.

¹⁰ Skelton, op. cit. (n. 1), pp. VI-VII.

¹¹ Biblioteca Nazionale Centrale di Roma, shelfmark 70.1.G.5; Biblioteca Apostolica Vaticana, shelfmark Stamp.Ferr.S.37.

¹² In case they were present, it is plausible to extend the collation with two or three fly and end leaves.

¹³ Veneziani, op. cit. (n. 1), p. 201.

¹⁴ Skelton, op. cit. (n. 1), p. VII; In contrast to Skelton, we believe that the register and the colophon are printed on the recto of an additional separate leaf. This will be explained later in this chapter. In that case, one leaf should be added to the collation described by Skelton leading to a total of 127 leaves. Additionally, in some very richly illuminated copies two supplementary interleaves were found in front of the maps *TABVLA OCTAVA* and *NONA D ASIA*. Probably for presentation purposes because these two maps only cover one page, unlike the other maps. Some have been reinserted incorrectly during re-binding; Biblioteca Medicea Laurenziana, shelfmark, Inc.I.5; Biblioteca Nazionale Universitaria di Torino, shelfmark XV.I.42; Biblioteca Nazionale Centrale di Roma, shelfmark 70.1.G.5; Biblioteca Universitaria Alessandrina, shelfmark Inc.541; Scheepvaartmuseum, shelfmark Me 0376.

The fonts

Skelton specified that three distinct fonts were used for the printed edition of Berlinghieri's *Geography*.¹⁵ He established this by the analysis described in the British Museum Catalogue.¹⁶ Type 115 R^a is used in the complete poem, except for the text on the two unsigned preliminary leaves and on sig. a:1, the foreword to Liber Primus, the latter part of Liber Secundus (sig. cc-3 - dd3), and the complete Liber Tertius (sig. ee1 - hh4). Type 115 R^b is used in the six gazetteers together with the latter part of Liber Secundus (sig. cc-3 - dd3) and the complete Liber Tertius (sig. ee1 - hh4). Type 111 R^a is used for the text on the two unsigned preliminary leaves and on sig. a:1.¹⁷ He assumes that the sequence of types represents the order of printing. This led to the suggestion in BMC that the gazetteers had not yet been set up. Skelton's alternative explanation for the use of two fonts is the simultaneous operation of two printing presses.¹⁸ Veneziani mentions in his article the same fonts for the same parts of the book.¹⁹ In addition to Skelton, he emphasized that these fonts also could have been used later than the date suggests. He finds it remarkable that a mix of fonts was used to print the *Geography*. The reasons for this could have been typographical demands, wear and tear of the letters, or simultaneous use of the letters for other books. Finally, he suggests that the book could have been printed with interruptions. During these breaks, other books or the maps could have been printed.²⁰

In most copies extant today, an additional title was printed in red on the recto of the leaf with the title printed in black on the verso. The fonts used for this title in red differ from those used by Tedesco.²¹ According to BMC, this title with one Gothic and three Roman fonts is certainly from after 1500.²² BMC assumed that the register and colophon were printed with the smallest font applied for this new title. This is in contradiction with Skelton's theory about printing the register and colophon quite soon after the printing of the text pages and gazetteers of the *Geography*.²³ Veneziani states that the *Geography* was not a commercial success, despite the author's personal intervention in the sale and presentation. A large part of the publication remained unsold. After Berlinghieri's death in 1500, it was acquired by a printer who tried to reissue the book by modernizing the title and the addition of a register.²⁴ Veneziani bases this on the fact that most of the remaining copies contain the added title in red, which is characteristic of this reissue. In his opinion, four fonts were applied for the title printed in red, and the register and colophon. These were in use in Florence at the beginning of the sixteenth century.²⁵ Veneziani states they are identical to the characters used by the publishing house of the

¹⁵ Skelton, op. cit. (n. 1), p. VI; Ross King, *The bookseller of Florence* (Amsterdam 2021), pp. 176-8; The use of the woodcut technique for printing text is very laborious. For one page of Gutenberg's Bible, 2500 letters would have to be cut. Therefore, Gutenberg created letters with the help of stamps. These were steel letter bars, about six centimeters long, with a letter carved in relief and a mirror image on the end. The cut end of the stamp was forcefully pressed into a copper mould. This was inserted into a casting device after which the letter-shaped cavity was filled with Gutenberg's special alloy of molten lead, tin, and antimony. His alloy detached itself nicely from the mould, received the ink well and transferred it clearly to the paper. He needed 290 stamps for his alphabet. Some letters appeared hundreds of times per page. So, in many cases hundreds of printing letters were cast from one mould.

¹⁶ British Museum Catalogue (BMC), VI, pp. 629-30. As cited in Skelton, op. cit. (n. 1), p. IX.

¹⁷ Skelton, op. cit. (n. 1), p. VI; Type 115 R^a was apparently in use prior to 1481. Type 115 R^b was presumably made for the Dante which was completed on August 30, 1481. The number represents the vertical size of 20 lines of text and the capital R means Roman. Type 111 R^a was in use in 1482, 1483 and apparently later. The earliest dated book, in which it is applied, is of October 22, 1482. We assume this must concern the 1482 edition of the book *Regola della vita spirituale* by Cherubino da Siena. Obviously, BMC based all this on the presence of these fonts in books printed by Tedesco. In our opinion they forgot to mention that a font can also have been applied later.

¹⁸ Skelton, op. cit. (n. 1), p. VI.

¹⁹ Veneziani, op. cit. (n. 1), p. 201.

²⁰ Ibid, pp. 200-01.

²¹ Skelton, op. cit. (n. 1), p. IX.

²² Ibid, p. IX.

²³ Therefore, Skelton asked George Painter to take another look at the fonts. Painter is of the opinion that the font used for the register and colophon is different from the fonts used in the new title in red. It would be a variant of the fonts available to Tedesco, another version of the two fonts 115 R^a and R 115^b. So, a fourth font seems to have been used: George D. Painter, Letters to R.A. Skelton, January 4, March 30, 1966. As cited in Skelton, op. cit. (n. 1), pp. IX, XIII.

²⁴ Veneziani, op. cit. (n. 1), p. 206.

²⁵ Ibid, p. 206.

Giunti.²⁶ The two sets of capital letters of 5 and 10 mm were in use by Filippo Giunti from 1516 on. Afterwards, his heirs applied them for several decades. A Roman letter of 106 mm was used for the title. The last of the four letters was applied for the register. This type of letter would have been employed for the first time in the *Giostra di Lorenzo de' Medici*, by Luigi Pulci, signed by Bernardo di Filippo Giunti. The font is also found in the *Ninfale Fiesolano*, by Boccaccio, from November 18, 1518. Therefore, Veneziani dates the printing of the title in red and the page with the register and colophon in the years immediately following 1520.²⁷ In the following sections of this chapter, we will present our findings and try to clarify these ambiguities.

Typographic and print characteristics of the regular text

The regular text is printed double sided, with large margins and in two columns of 51 lines. We found the following typographical characteristics and inconsistencies in each of the nineteen copies of which the text pages were studied in detail. The typesetting is somewhat irregular in all directions (Fig. 339). The capital Z is often printed mirrored (Fig. 340). Generally, the headings above the various chapters are printed in capitals. However, we regularly found a lowercase letter between the capital letters. Usually, this concerned the letter y and occasionally the letter u, such as in BETHyCA and CIRCULARE (Fig. 341-42). Sometimes more than one lowercase letter is present in the headings above the chapters like in SITO DI MARMARICA Lbya & ditutto lo Egypto (Fig. 343). Incorrect spelling was another feature found in the headings above the chapters. SEGVITA for example was found spelled SEQVITA, but also as SEGHVITA (Fig. 344-46).

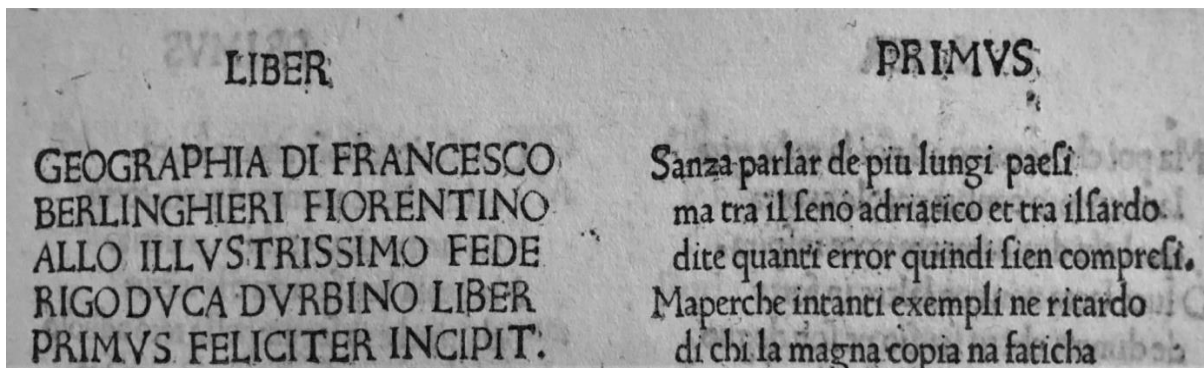


Fig. 339

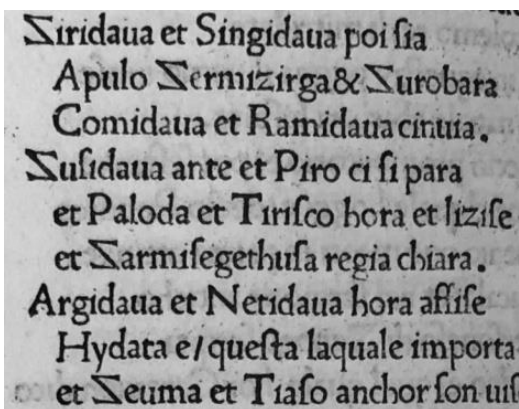


Fig. 340

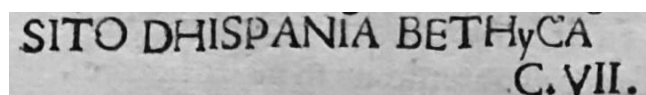


Fig. 341

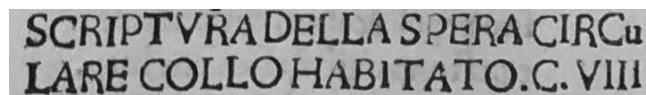


Fig. 342

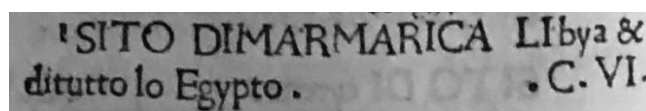


Fig. 343

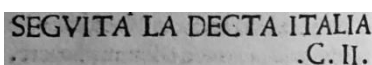


Fig. 344

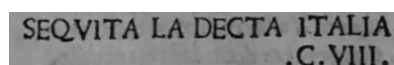


Fig. 345

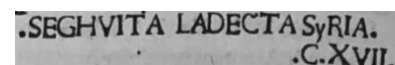


Fig. 346

²⁶ Bernardo Giunti took over the printing house from his father in 1516 and published reprints of cartographic books, e.g., Pontanus and Mela, and Italian works until 1533: William A. Pettas, *The Giunti of Florence Merchant Publishers of the sixteenth century* (San Francisco 1980), pp. 55, 61, 65-72.

²⁷ Veneziani, op. cit. (n. 1), p. 206.

At the top of each text page a header is present. It is composed by the word LIBER, followed by the number of the respective LIBER. Several inconsistencies regarding these headers were found. PRIMVS LIBER is printed instead of LIBER PRIMVS on the recto of two consecutive leaves in Liber Primus (Fig. 347). Comparably, in Liber Tertius TERTIVS LIBER is present, instead of LIBER TERTIVS (Fig. 348).

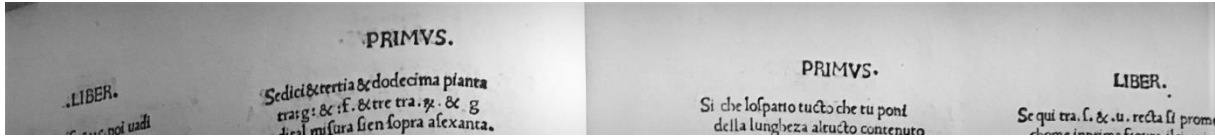


Fig. 347



Fig. 348

Another inconsistency concerning the headers was the absence of the header in two different Libers. The first one was found on the recto of the leaf halfway Liber Secundus (Fig. 349).²⁸ The second one is present on the recto of the first leaf of Liber Quartus (Fig. 350). On both leaves the header is missing. A final

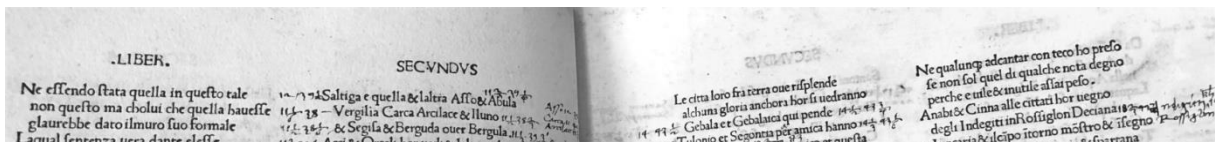


Fig. 349

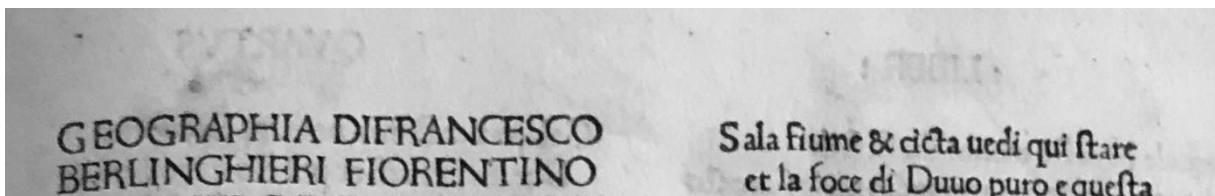


Fig. 350

irregularity regarding the headers was found in Liber Quintus. At the end of Liber Quintus only one column of text is printed at the left side of the page. The header LIBER is present above the first column, but the header QVINTVS is missing above the second one. At the bottom of this page FINIT LIBER QVINTVS is printed, instead of QVINTVS (Fig. 351).

We conclude with some examples of irregularities concerning the page numbering. On the recto of the third leaf, the page number a:i is printed what probably should have been .aa.i., conform the page numbering applied in the rest of Liber Primus (Fig. 352). It most probably concerns another inconsistency by Tedesco. In the register, the use of a double lowercase letter is found for this leaf (Fig. 353). Obviously, Tedesco corrected himself partially on this page. On the recto of the fifth leaf, we found the page number .aa.iii. On the recto of the sixth leaf the page number .aa.iii. is printed again, which is another typographical error (Fig. 354). It should have been .aa.iiii. Analogous to that, on the recto of the seventh leaf the page number .aa.iiii. instead of .aa.iiii. was present (Fig. 355). In the copy studied in Brussels the right page numbers were found although the punctuation was a bit different: .aa.iiii. and .aa.iiii. (Fig. 356-57).²⁹

In contrast with the examples above, the following inconsistencies were found incidentally in and randomly distributed over each of the nineteen copies studied. Page numbers were found to be absent in some cases, where they were present in others (Fig. 358-59). In several copies in a header of Liber Tertius the word TERTIVS is printed interspaced as follows TERTI VS (Fig. 360). The guide letters placed for the illuminator were regularly found missing. Perhaps the galley with type was not always

²⁸ In addition, on the right page the font changes from 115 R^a to 115 R^b.

²⁹ De Koninklijke Bibliotheek van België, shelfmark Inc C 208.

evenly inked. Another explanation might be that this guide letter or page number had fallen out of the galley during inking and was replaced later. An example of the presence of an enlarged and illuminated guide letter as well as a missing one in another copy is shown in figures 361-62. In some copies we found offset or *abklatsch* on text pages (Fig. 363). This occurs when a freshly printed leaf is placed on another leaf. It is an additional example that nothing was discarded.

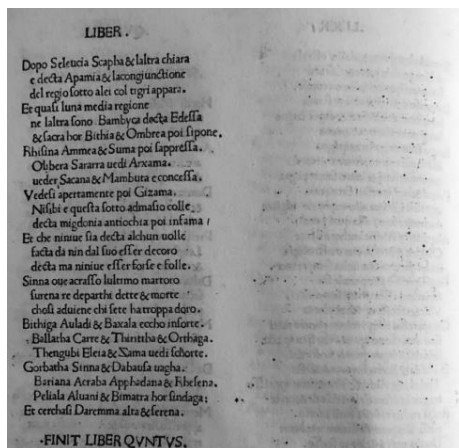


Fig. 351

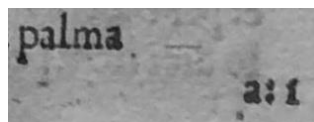


Fig. 352

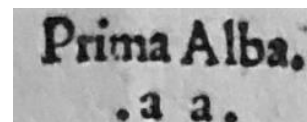


Fig. 353

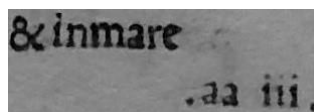


Fig. 354

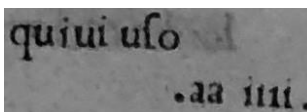


Fig. 355

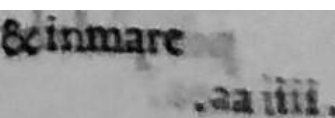


Fig. 356

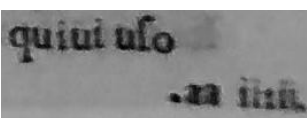


Fig. 357

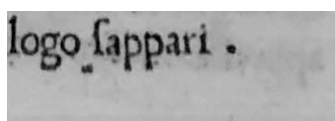


Fig. 358

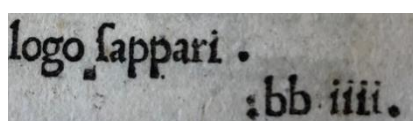


Fig. 359



Fig. 360

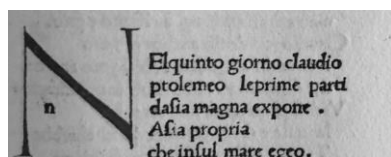


Fig. 361

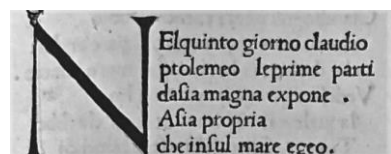


Fig. 362

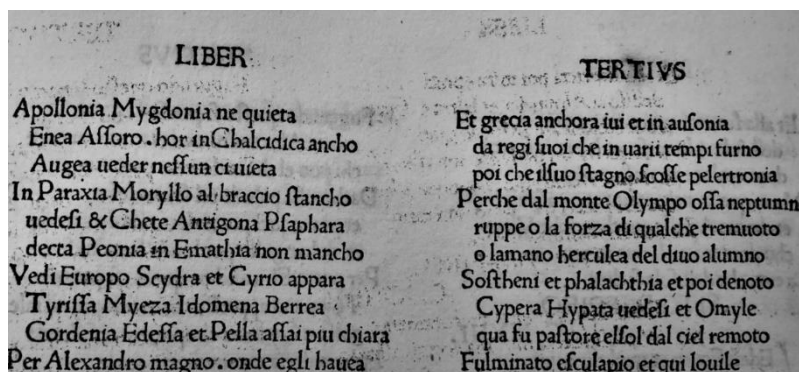


Fig. 363

Typographic and print characteristics of the gazetteers

In contrast with the regular text pages, where 51 lines are found on each page, the gazetteers of Liber Secundus, Tertius, Sextus, and Septimus mostly contained 50 lines. On the last page of the gazetteer of Liber Tertius two columns of 53 lines were applied and even 54 lines in the last column. In Liber Sextus 51 lines were present on the final page. In the complete gazetteer of Liber Quartus, 53 lines were found except for the last page where 52 lines were present. According to us, these are all slight adjustments applied to prevent the use of an extra leaf of paper for only a few lines of toponyms. Another example concerns the gazetteer of Liber Quintus where mostly 54 and on the last page 56 lines were applied. On the third and second to last pages of this gazetteer even 59 lines were present. On these two pages the headers were absent (Fig. 364). We believe that this is not a coincidence but that it was deliberately applied by Tedesco. It was his solution to avoid the use of an extra leaf of paper to print this gazetteer.

Fig. 364

The headers

The gazetteers in the *Geography* form a specific element in typeset, compared to the text pages. They contain the place names and their coordinates. Since they play an important role in the chronology and production of this book, we have decided to discuss them separately. At the top of each page in the gazetteers, like in the regular text, a header with the respective LIBER was printed, for example LIBER TERTIVS. As in the regular text pages, we found several inconsistencies with respect to these headers in the gazetteers. Some were present in every atlas studied. Others were found in some copies and three were found only once. In the gazetteer of Liber Tertius, on the verso of the first leaf, no header at all was printed (Fig. 365). On the recto and verso of the second leaf of this gazetteer the header LIBER SECVNDVS, which should have been LIBER TERTIVS, was found in all atlases studied (Fig. 365).

Fig. 365

Fig. 366

Fig. 367

In some atlases the same error was found on the recto of the third leaf. Again, the header LIBER SECVNDVS was present (Fig. 366). This aberration appeared in a few copies only. In most cases LIBER TERTIVS was printed (Fig. 367). This is an example of editing during printing. Similar mistakes were made in the gazetteer of Liber Quartus. In some copies, LIBER SEXTVS was printed instead of LIBER QVARTVS on the recto of the first leaf of the gazetteer (Fig. 368-69). LIBER SEXTVS was also present on the verso of this first leaf in all copies studied (Fig. 370). On the verso of the second leaf in most but not all copies LIBER SEXTVS was printed again (Fig. 371-72). The gazetteer of Liber Quintus contains another inconsistency. On the verso of the first page of this gazetteer LIBER QVINTVS was printed interspaced like follows, QVIN TVS, comparable with TERTI VS in the regular text (Fig. 373). In the gazetteer of Liber Sextus two abnormalities were found. LIBER SEPTIMVS was printed instead of LIBER SEXTVS on the recto of the first leaf of the gazetteer in one copy only.³⁰ In another copy, also on the recto of the first leaf, LIBER EXTVS could be read. The S from SEXTVS was missing (Fig. 374) in this copy

Fig. 368

Fig. 369

³⁰ <http://beta.historicmapworks.com/Atlas/OL/107323/>

only. In the gazetteer of Liber Septimus LIBER TERTIVS was printed instead of LIBER SEPTIMVS. Again, this error was detected in one copy only (Fig. 375).³¹

LIBER		SEXTVS	
Serbetto in foce	19 $\frac{1}{2}$ 32 $\frac{1}{2}$	Vibara	11 $\frac{1}{2}$ 33 $\frac{1}{2}$
Sextaria pro.	10 34 $\frac{1}{2}$	Vladio pro.	7 $\frac{1}{2}$ 29 $\frac{1}{2}$
Sigapoli	12 34 $\frac{1}{2}$	Vilara	22 30 $\frac{1}{2}$
Siga in foce	12 $\frac{1}{2}$ 34 $\frac{1}{2}$	Salaco monte	16 31 $\frac{1}{2}$
Silda	7 $\frac{1}{2}$ 33 $\frac{1}{2}$	Zaracha	23 $\frac{1}{2}$ 30 $\frac{1}{2}$
Symutha	20 $\frac{1}{2}$ 32 $\frac{1}{2}$	Zalia in foce	6 34 $\frac{1}{2}$
Sifaro in foce	23 32 $\frac{1}{2}$	Salie	6 $\frac{1}{2}$ 34 $\frac{1}{2}$
Sitici colle	26 29 $\frac{1}{2}$	Zuchabbari	16 $\frac{1}{2}$ 32 $\frac{1}{2}$
Subar	6 $\frac{1}{2}$ 34 $\frac{1}{2}$	TABVLA SECVNDA DE APHICA	
Subar in foce	6 $\frac{1}{2}$ 34 $\frac{1}{2}$		

Fig. 370

LIBER		SEXTVS	
Aphodine isola	64 $\frac{1}{2}$ 24	Cheronefo magna	42 31 $\frac{1}{2}$
Aphodine isola	64 $\frac{1}{2}$ 24	Cheronefo parua poro	60 31
		Hyphali	47 $\frac{1}{2}$ 29 $\frac{1}{2}$
		Hyphela	62 27 $\frac{1}{2}$

Fig. 371

LIBER		QVARTVS	
Aphodine isola	64 $\frac{1}{2}$ 24	Cheronefo magna	42 31 $\frac{1}{2}$
Aphodine isola	64 $\frac{1}{2}$ 24	Cheronefo parua poro	60 31
		Hyphali	47 $\frac{1}{2}$ 29 $\frac{1}{2}$
		Hyphela	62 27 $\frac{1}{2}$

Fig. 372

LIBER		QVINTVS	
Cibyra	60 $\frac{1}{2}$ 30 $\frac{1}{2}$	Corena	68 $\frac{1}{2}$ 37 $\frac{1}{2}$
Cibitra	66 38 $\frac{1}{2}$	Cormefa	61 $\frac{1}{2}$ 27 $\frac{1}{2}$
		Encanda	61
		Ephelo	47 $\frac{1}{2}$

Fig. 373

LIBER		SEXTVS	
Abacena	91 36	Bellara	77 38 $\frac{1}{2}$
Abenna	84 $\frac{1}{2}$ 33 $\frac{1}{2}$	Berbaba	77 $\frac{1}{2}$ 38 $\frac{1}{2}$
		Europa	91 $\frac{1}{2}$ 36 $\frac{1}{2}$
		Eulco in foce	34 $\frac{1}{2}$ 30 $\frac{1}{2}$

Fig. 374

LIBER		TERTIVS	
TABVLA DECIMA DE ASIA		Bardaoti	137 $\frac{1}{2}$ 28 $\frac{1}{2}$
		Bardamana	136 $\frac{1}{2}$ 19 $\frac{1}{2}$
		Bardaxima	113 $\frac{1}{2}$ 20 $\frac{1}{2}$
		Dallindo parte	113 $\frac{1}{2}$ 22 $\frac{1}{2}$
		Carmara	130 $\frac{1}{2}$ 19 $\frac{1}{2}$
		Carnafa	120 34 $\frac{1}{2}$

Fig. 375

The titles of the maps in the gazetteers

In general, a gazetteer starts with the title of the corresponding map, e.g., Tabula Secunda De Europa. This is followed by the concordant toponyms and their coordinates in alphabetical order. We found a lot of inconsistencies regarding these titles in the gazetteers. Normally they begin with the word Tabula followed by the number, e.g., Secunda (Fig. 376). There was one exception, QVARTA TABVLA DE EVROPA. Here the words TABVLA and QVARTA are reversed (Fig. 377). Another irregularity concerns the titles of the maps. These were printed in capitals, except for TABVLA PRIMA Deuropa (Fig. 378). In this title europa was printed in lowercase. Besides that, the word DE in front of Europa had become a D. The only other title with this feature is TABVLA PRIMA DASIA (Fig. 379).

Vxello	18 $\frac{1}{2}$ 49 $\frac{1}{2}$
TABVLA SECVNDA DE EVROPA	
Abdara	10 $\frac{1}{2}$ 37 $\frac{1}{2}$
Abula	11 $\frac{1}{2}$ 39 $\frac{1}{2}$

Fig. 376

QVARTA TABVLA DE EVROPA	
Abulano	39 $\frac{1}{2}$ 47 $\frac{1}{2}$
Abnchii monti	31 41 31 49
Albi in foce	31 46 $\frac{1}{2}$

Fig. 377

Distanze eleuazioni de liti soli po fu nelle tabule	
TABVLA PRIMA Deuropa	
Abo in foce	2 46 $\frac{1}{2}$
Abrauno in foce	19 $\frac{1}{2}$ 61

Fig. 378

TABVLA PRIMA DASIA	
Abydo	44 $\frac{1}{2}$ 41 $\frac{1}{2}$
Ablata	68 $\frac{1}{2}$ 42

Fig. 379

The titles were usually printed on two lines (Fig. 380-86), except for the titles of the maps TABVLA PRIMA Deuropa, DE APHRICA, and DASIA, and TABVLA VIII and VIII DE ASIA. They were printed on one line (Fig. 378-79, 387-89, 399). In addition, the second line was always centered under the first line, except for the titles TABVLA SECVNDA, TERTIA, QVARTA, QVINTA and SEPTIMA DE EVROPA. For these titles, the two lines were aligned to the left (Fig. 376-77, 385-86, 390).

Vulcania isola	38 $\frac{1}{2}$ 38 $\frac{1}{2}$
TABVLA OCTAVA DE EVROPA	
Acra c.	60 $\frac{1}{2}$ 49 $\frac{1}{2}$
Agaro in foce	62 $\frac{1}{2}$ 40 $\frac{1}{2}$

Fig. 380

Senone cheronefo	63 48 $\frac{1}{2}$
TABVLA NONA DE EVROPA	
Abdera	42 $\frac{1}{2}$ 41 $\frac{1}{2}$
Abata	43 $\frac{1}{2}$ 48

Fig. 381

Zurobara	49 $\frac{1}{2}$ 49 $\frac{1}{2}$
TABVLA DECIMA DE EVROPA	
Abea	49 $\frac{1}{2}$ 39 $\frac{1}{2}$
Acantho	40 $\frac{1}{2}$ 40 $\frac{1}{2}$

Fig. 382

³¹ De Koninklijke Bibliotheek van België, shelfmark Inc C 208.

Vdone in focē	87	48 $\frac{3}{4}$
TABVLA TERTIA DE ASIA		
Abo monte	77	41
Ablana	78	44 $\frac{1}{2}$

Fig. 383

Zurgua	78 $\frac{1}{2}$	41 $\frac{3}{4}$
TABVLA QVARTA DE ASIA		
Abida	68 $\frac{1}{2}$	32 $\frac{3}{4}$
Abila	98 $\frac{1}{2}$	33 $\frac{1}{2}$

Fig. 384

Altro fonte	40	42 $\frac{3}{4}$
TABVLA QVINTA DE EVROPA		
Abudiaco	33 $\frac{1}{2}$	46 $\frac{1}{2}$
Acuminco	44	49 $\frac{3}{4}$

Fig. 385

Vxento	42 $\frac{1}{2}$	39 $\frac{3}{4}$
TABVLA SEPTIMA DE EVROPA		
Abacena	39	38 $\frac{1}{2}$
Acithio in focē	37 $\frac{1}{2}$	36 $\frac{1}{2}$

Fig. 386

The titles of the maps *TABVLA OCTAVA* and *NONA DE ASIA* were displayed differently from all the others shown. Instead of the word *OCTAVA* and *NONA*, the Roman numerals *VIII* and *VIII* were used (Fig. 387-89). On top of that, instead of the number *VIII*, the number *IX* should have been applied. In some atlases we found the letters *DSID* instead of *ASIA* in the title for the map *TABVLA VIII DE ASIA*, another example of editing during printing (Fig. 388-89).

Mette in oxo	112 $\frac{1}{2}$	44
Zaripa	114	44
TABVLA. VIII. DE ASIA		
Abragana	163 $\frac{1}{2}$	39 $\frac{1}{2}$
Annibi monti	146 60 171	46

Fig. 387

Throana	174 $\frac{3}{4}$	47 $\frac{3}{4}$
TABVLA. VIII. DE DSID		
Alexandria in aria 110	36	
Alexandria	114	31

Fig. 388

Throana	174 $\frac{3}{4}$	47 $\frac{3}{4}$
TABVLA. VIII. DE ASIA		
Alexandria in aria 110	36	
Alexandria	114	31

Fig. 389

No dots were used in the titles, except in *TABVLA TERTIA DE EVROPA*. in *TABVLA SEPTIMA DE ASIA*. in *TABVLA. VIII. DE ASIA* and *TABVLA. VIII. DE DSID* or *ASIA* (Fig. 387-91).

Vxamabarca	13	44 $\frac{1}{2}$
TABVLA TERTIA DE EVROPA.		
Acufio. col.	23	44 $\frac{3}{4}$
Adula monte	29 $\frac{1}{2}$	44 $\frac{1}{2}$

Fig. 390

Soromba in focē	102 $\frac{1}{2}$	20
TABVLA SEPTIMA DE ASIA.		
Abarbina	97	40 $\frac{1}{2}$
Adscenfio	124	43

Fig. 391

The titles *TABVLA SEXTA DE EVROPA*, and *TABVLA QVINTA* and *SEXTA DE ASIA* were missing above the corresponding gazetteers (Fig. 392-94).

EXPLICIT LIBER TERTIVS.		
Abella	40 $\frac{1}{2}$	41 $\frac{1}{2}$
Abellino	40 $\frac{1}{2}$	40 $\frac{1}{2}$
Abysto	40 $\frac{1}{2}$	39 $\frac{1}{2}$
Aceto	37 $\frac{1}{2}$	44 $\frac{1}{2}$

Fig. 392

LIBER		
Abacena	93	36
Abinina	84 $\frac{1}{2}$	33 $\frac{1}{2}$
Acbatana	88	37 $\frac{1}{2}$

Fig. 393

Zaza	68 $\frac{1}{2}$	31
Zoara	67 $\frac{1}{2}$	31 $\frac{1}{2}$
Abifama. cl.	82	11 $\frac{1}{2}$
Abilla	92 $\frac{1}{2}$	20 $\frac{1}{2}$
Achindana in focē	96 $\frac{1}{2}$	26

Fig. 394

We also found differences between the titles used in the gazetteer and those present on the maps. On the second map of Africa and Asia the word *SECONDA* was present in the title above the map, whereas *SECVNDA* was used in the gazetteer (Fig. 395-96).

Zuchabbari	16 $\frac{1}{2}$	32 $\frac{3}{4}$
TABVLA SECVNDA DE APHRICA		
Acabe fonte	44 $\frac{1}{2}$	26 $\frac{1}{2}$
Acola	37 $\frac{1}{2}$	32 $\frac{1}{2}$

Fig. 395

Zoropaffo	69 $\frac{3}{4}$	39
TABVLA SECVNDA DE ASIA		
Abune	73	48
Achea uilla	67	47 $\frac{1}{2}$

Fig. 396

Further, variations regarding the already mentioned use of D instead of DE were detected between the titles on the maps and those in the gazetteer. The greatest inconsistencies have been found in relation to the titles used for Aphrica. On the second, third and fourth map of Aphrica, *DI LIBYA* was used on the maps. Instead, *DE APHRICA* was applied in the gazetteers (Fig. 397-99). The titles probably were copied from a different source than the ones for the maps. The first map of Aphrica is titled *TABVLA PRIMA DI LIBYA QVALE ET APHRICA* on the map, while in the gazetteer *TABVLA PRIMA DE APHRICA* is applied (Fig. 399).

Zurmento	37	31 $\frac{1}{2}$
TABVLA TERTIA DE APHRICA		
Abathuba	41 $\frac{1}{2}$	30
Abydo	61 $\frac{2}{3}$	26 $\frac{5}{6}$

Fig. 397

Zigriulla	44 $\frac{1}{2}$	31 $\frac{1}{2}$
TABVLA QVARTIA DE APHRICA		
Abunce	49 $\frac{1}{2}$	20
Acanne emp.	82	7

Fig. 398

TABVLA PRIMA DE APHRICA		
Abyla columna	7 $\frac{5}{6}$	34 $\frac{2}{3}$
Acra pro.	11 $\frac{1}{2}$	24
Acrath	9	34 $\frac{1}{2}$
Addima	20	22 $\frac{1}{2}$

Fig. 399

The gazetteer of Liber Septimus was the most consistent regarding spelling, typesetting, and layout of the titles (Fig. 400-02). The modern maps are not mentioned at all in the gazetteers. The reason probably was that Ptolemy's *Cosmographia* in its original composition does not contain these modern maps.

TABVLA DECIMA DE ASIA		
Abur	129	16
Acur	124 $\frac{2}{3}$	14 $\frac{1}{3}$

Fig. 400

Fonte	132	36
TABVLA VNDECIMA DE ASIA		
Acadra	167	4 $\frac{5}{6}$
Acathara	178 $\frac{1}{2}$	21 $\frac{1}{2}$

Fig. 401

Sabe.ci.	168 $\frac{1}{2}$	4 $\frac{2}{3}$
TABVLA DVODECIMA DE ASIA		
Abaratha.ci.	131	3
Adifamo	129	4

Fig. 402

Toponyms and coordinates

In some copies, Thyle with a series of coordinates was found on the recto of the first page of the gazetteer of Liber Secundus at the bottom of the right column (Fig. 403). In other copies, Thyle and the coordinates were missing (Fig. 404). Instead, at the bottom of the page, the same two preceding toponyms were present as at the top of the verso. There, they are printed again, albeit in reverse order (Fig. 405). Together with the modifications of the header in the gazetteers of Liber Tertius and Quartus as already described, this is the clearest proof that adjustments have been made during the printing of these pages. Another imperfection observed, concerns the typesetting. The letters of the toponyms in the first column were sometimes continued in the second column, designated for the coordinates and vice versa. In some cases, this caused displacement of the text or coordinates. It disrupts the typographical impression of a page. Different examples are shown in (Fig. 406-09).

Taruedume	31 $\frac{1}{2}$	60 $\frac{1}{2}$
Taua esto	24	48 $\frac{1}{2}$
Thyle	29, 63: 31 $\frac{2}{3}$ 63	
33, 63 $\frac{1}{4}$ 33 62 $\frac{2}{3}$ 33 63		
Tina in foco	24	48 $\frac{1}{2}$
Tifobio in foco	14 $\frac{2}{3}$	46 $\frac{1}{3}$
Tobio in foco	14 $\frac{1}{2}$	44 $\frac{1}{2}$
Toliat	23	44 $\frac{1}{3}$
Trimontio	19	49
Trifanton in foco	20 $\frac{1}{3}$	43
Tuerobi in foco	14 $\frac{1}{2}$	44 $\frac{1}{2}$

Fig. 403

Taruedume	31 $\frac{1}{2}$	60 $\frac{1}{2}$
Taua esto	24	48 $\frac{1}{2}$
Tina in foco	24	48 $\frac{1}{2}$
Tifobio in foco	14 $\frac{2}{3}$	46 $\frac{1}{3}$
Tobio in foco	14 $\frac{1}{2}$	44 $\frac{1}{2}$
Toliat	23	44 $\frac{1}{3}$
Trimontio	19	49
Trifanton in foco	20 $\frac{1}{3}$	43
Tuerobi in foco	14 $\frac{1}{2}$	44 $\frac{1}{2}$
Tuesi	26 $\frac{1}{2}$	49 $\frac{1}{2}$
Tuesi esto	27	49

Fig. 404

LIBER		
Tuesi esto	27	49
Tuesi	26 $\frac{1}{2}$	49 $\frac{1}{2}$
Vandua	21 $\frac{2}{3}$	60
Varare esto	28 $\frac{1}{2}$	49 $\frac{2}{3}$
Vacti	19 $\frac{2}{3}$	42 $\frac{1}{3}$
Vedra in foco	13	61
Vedro in foco	20 $\frac{1}{2}$	48 $\frac{1}{2}$
Vennicneo. pro.	12 $\frac{1}{2}$	61 $\frac{1}{2}$

Fig. 405

Secunda aborea	36	46 $\frac{2}{3}$
alra 39 $\frac{1}{3}$ 47 $\frac{1}{3}$ alia 40 $\frac{2}{3}$		
47 $\frac{1}{3}$ alia 41 47 $\frac{2}{3}$ Flexio		
42 47 alia 42 $\frac{1}{2}$ 48		
Deuona	32 $\frac{1}{2}$	48 $\frac{2}{3}$
Eburoduno roboduono	39	48
Ebturo	41	49 $\frac{1}{2}$
Hegimatria	30 $\frac{2}{3}$	41

Fig. 406

Caphalonia	47 $\frac{2}{3}$	37 $\frac{1}{2}$
Promó boreale	47 $\frac{2}{3}$	37 $\frac{1}{2}$
Australe	47 $\frac{2}{3}$	36 $\frac{2}{3}$
Cephiso nasce dapido et callidro		
mo et riceue pre deuono et poi si		
diuide iasapo et cephiso i 42 38		
Celidno in foco	44	39 $\frac{1}{3}$
Chelonita. pro.	48	36 $\frac{1}{2}$

Fig. 407

Arfinoe	74	10 $\frac{2}{3}$
Artagura	44	18
Arualte monte	33	3
Aspi extrema	64 $\frac{1}{2}$	19 $\frac{2}{3}$
Astabora entra i astapo 62 $\frac{1}{2}$ 11 $\frac{1}{2}$		
Astapo entra in nilo	61	12
Aualte emp.	74	8 $\frac{1}{2}$
Autoba	61 $\frac{1}{2}$	21 $\frac{1}{2}$

Fig. 408

Foce	42	16
Cherlonefo	64	22
Cobe emp.	80	8
Colobon. pro.	68	13 $\frac{2}{3}$
Colona. ci.	62	4 $\frac{2}{3}$
Colona palude	69	Equinoctio
Crono di noto. pro.	79	1
Cupha	23 $\frac{1}{3}$	18

Fig. 409

The letters and fonts in the gazetteer

In the gazetteer, some toponyms begin with a lowercase, instead of a capital letter (Fig. 410). Tedescho used different fonts to print different parts of the *Geography*, as mentioned.³² However, the use of different fonts on one and the same page was not noticed until now. It concerns the capital letters A, B and M (Fig. 411-13). A possible explanation might be that the gazetteers use a large number of the same capital letters on a single page, more than on regular text pages. That may have created a problem regarding the availability of specific capital letters. The stock may have been insufficient, which might explain the use of different fonts on several pages of the gazetteers. In any case, the mixed use of different fonts and lowercase and capital letters on the same page apparently did not bother Tedescho. Further, toponyms in the gazetteers are regularly listed in a wrong alphabetical order (Fig. 414). To conclude, the letter Z is regularly printed mirrored (Fig. 415).

Ammonio.pro.
ancala
anga uilla
andane in focce
appa
apphana
ara regia
ara infula
arabia emp:
aramaua
aratho
arga uilla

Fig. 410

Acufio.col.
Adula monte
Agatha ifola
Agatopoli
Agedeco
Agino
Agirpina
Alba augusta
Anderedo
Andomatunno
Antipoli
Aque auguste

Fig. 411

Aufoba in focce
Banarta
Belufama esto
Birgo in focce
Boderia alto
Bolerio.pro.
Boreo pro.
Brannogenia
Bremenio
Bubinda in focce
Bulleo
Calato

Fig. 412

Mycale.m.
Midaio
Mylafa
Mileto
Milya
Mima.m.
Myndo
Myndo
Minya
Myrra
Myrina
Misthio

Fig. 413

Sapolo
Sarata
Satyri ifole
Saryri.pro.
Sematini moti
Seno de fint
Seno in focce
Fonre
Sero in focce
Due font 170¹/₂
Agiugnefi
Sinda.ci.

Fig. 414

Zagira
Zalisco in focce
Zama
Zela
Zephirio
Zephirio
Zephirio
Zimara
Siroatra
Sizoatra
Zoparisto
Zoropasso

Fig. 415

Typographic and print characteristics of other books printed by Tedescho

We compared several books printed and published by Tedescho between 1477 and 1486 (attachment two). Some of the features described in the preceding paragraphs can also be found in these books. For example, in the book *Monte santo di Dio* by Antonio da Siena, printed in 1477, the layout of the page numbering differs regarding the punctuation. Dots and double dots are used interchangeably. The chapter numbering is not correct, some are missing, for example Capitolo XXVIII and XXX. Another nice and typical example concerns the development of the book *Regola della Vita Spirituale* by Cherubino da Siena. This book was printed by Tedescho in 1477 and reissued in 1482 and 1483. Identical printing characteristics and flaws, as in Berlinghieri's *Geography*, are found in all editions. However, comparing these three releases with each other, a substantial progress in print quality has been achieved, which shows in the 1482 and 1483 edition. The same problems regarding the guide letters as in the *Geography* were found in the book *Disputationes Camaldulenses* by Landino.³³ Inconsistencies with the page numbering were also found. The book starts with single, followed by double, lowercase letters and at the end single ones are used once more. They are applied in the correct alphabetical order with an exception at the end of the book. Compared with the *Geography*, the headers were applied differently in this book. The word LIBER was present on top of the left page and the number (e.g., PRIMVS) on top of the right page. In Liber Primus we found the deviating combinations: 1) no header at the left and PRIMVS at the right, 2) PRIMVS PRIMVS, and 3) PRIMVS LIBER (Fig. 416-18). In Liber Secundus, SECVNDVS SECVNDVS was applied and in Liber Tertius, LIBER LIBER was present (Fig. 419-20). Finally, in Liber Quartus, QVARTVS QVARTVS was printed (Fig. 421). In Ficino's adaptation of Dante's *La Divina Commedia*, printed in 1481, we regularly found examples of the use of lower- and uppercase letters in the same words or sentences and even the use of multiple fonts or sizes of letters in a word (Fig. 422-24). Further, the typesetting was irregular, and the capital Z was printed mirrored as in the *Geography*, even in the colophon (Fig. 425).

³² Skelton, op. cit. (n. 1), p. VI; Veneziani, op. cit. (n. 1), p. 201.

³³ It was printed by Tedescho not after September 12, 1481, according to the Gesamtkatalog Wiegendrucke M16839.



Fig. 416



Fig. 417



Fig. 418

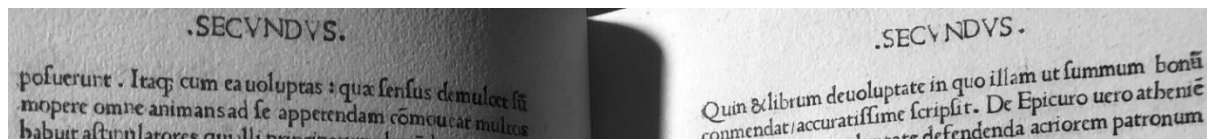


Fig. 419

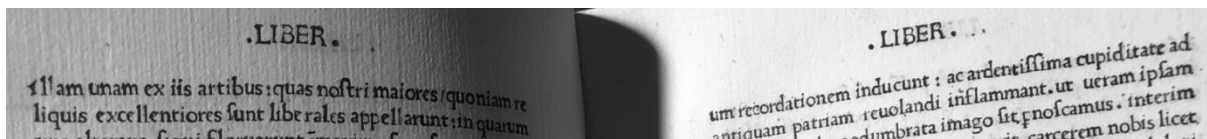


Fig. 420



Fig. 421

oso allanimo: elqual
CHE PRINCIPIO et
ma bene che neffuna

Fig. 422

se EL GRAnde amore che mha facto cercare el
te a sopportare fame: sete: sonno: caldo: et fred
be sopportate sanza lamore. EL Tuo uolume:
gilio: Nientedimeno tre sono le principali buce:
xe: Ma leneida imito in tutto. VEDI La bestia

Fig. 423

APPARECHIA TO

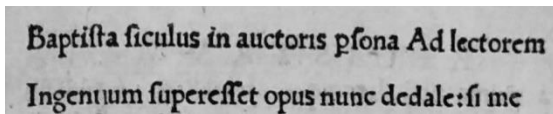
Fig. 424

FINE DEL COMENTO DI CHRISTO
PHORO LANDINO FIOREN
TINO SOPRA LA COMEDIA DI DAN
THE POETA EXCELLENTIS
SIMO. ET IMPRESSO IN FIRENZE
PER NICHOLO DI LORENZO
DELLA MAGNA A DI .XXX. DA
GOSTO. M.CCCC. LXXXI.

Fig. 425

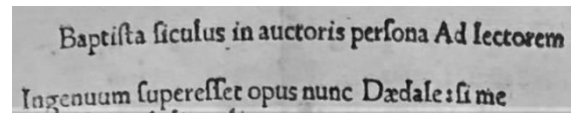
In the book *Sermones super Cantica canticorum* by Gilbertus de Hollandia, published in 1485, the numbering and naming of the different Sermons was quite irregular and inconsistent. Some examples are the presence of SERMO IDEM in between SERMO VNDECIMVS and SERMO DVODECIMVS. SERMO QVARTVSDECIMVS is followed by SERMO DECIMVSQVINTVS, then back again to SERMO SEXTVSDECIMVS which is followed for the second time by the reversed order SERMO DECIMVSSEPTIMVS, SERMO DECIMVSOCTAVVS and SERMO DECIMVSNONVS. From Sermo 20 on, numbers instead of letters were applied, e.g. SERMO .XX.VIII., what should have been .XX.IX. Sermo 36 is missing and Sermo 37 is used twice. For Sermo 39, the proper numbering .XXX.IX. is

applied. Finally, XLIII is followed by XLV and XLVI. The irregularities and inconsistencies found in earlier printed books thus persist in this book printed in 1485. The Roman numerals VIII and VIII instead of the words OCTAVA and NONA were applied comparably for the titles of the maps TABVLA OCTAVA and NONA DE ASIA in the *Geography*. Guide letters are also missing in *De re aedificatoria*, by Leon Battista, published in the same year. In this book we noticed numerous differences on the last pages of two different copies. These pages must have been typeset twice which is indicative of editing during printing as described for the toponym Thyle in the *Geography*. Additionally, it shows that in 1485 still nothing was discarded (Fig. 426-31).



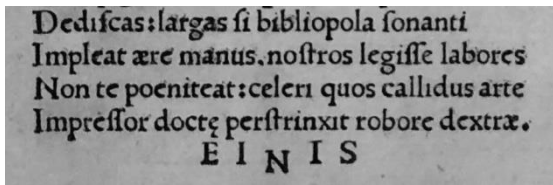
Baptista ficulus in auctoris psona Ad lectorem
Ingenuum superesset opus nunc dedale: si me

Fig. 426



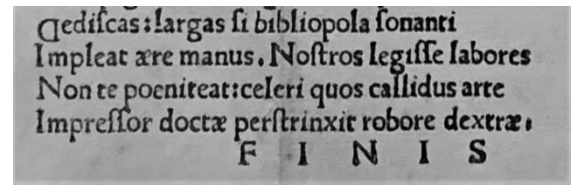
Baptista ficulus in auctoris persona Ad lectorem
Ingenuum superesset opus nunc Dedale: si me

Fig. 427



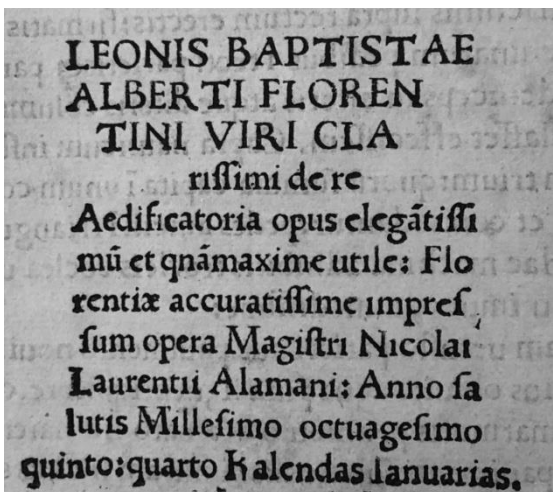
Dediscas: largas si bibliopola sonanti
Impleat ære manus. nostros legisse labores
Non te poeniteat: celeri quos callidus arte
Impressor doctæ perstrinxit robore dextræ.
E I N I S

Fig. 428



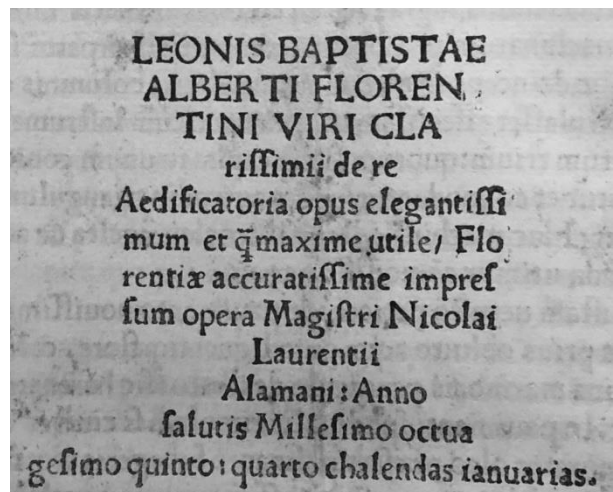
Dediscas: largas si bibliopola sonanti
Impleat ære manus. Nostros legisse labores
Non te poeniteat: celeri quos callidus arte
Impressor doctæ perstrinxit robore dextræ.
F I N I S

Fig. 429



LEONIS BAPTISTAE
ALBERTI FLORENTINI VIRI CLARISSIMI de re
Aedificatoria opus elegantissimum et quam maxime utile: Florentiæ accuratissime impressum opera Magistri Nicolai Laurentii Alamani: Anno salutis Millesimo octuagesimo quinto: quarto Kalendas Ianuarias.

Fig. 430



LEONIS BAPTISTAE
ALBERTI FLORENTINI VIRI CLARISSIMI de re
Aedificatoria opus elegantissimum et quam maxime utile: Florentiæ accuratissime impressum opera Magistri Nicolai Laurentii Alamani: Anno salutis Millesimo octuagesimo quinto: quarto chalendas ianuarias.

Fig. 431

To conclude this subject, we studied Ficino's edition of *Plato*, printed in 1484, in the printing office of the convent San Jacopo di Ripoli, in Florence. In the diary of this convent, notes were found concerning the involvement of Berlinghieri, together with Filippo Valori, regarding the printing of this work. In contrast to the publications by Tedescho, this book is printed very regularly. Nevertheless, in this book we discovered comparable inconsistencies regarding the headers and the use of lowercase letters in between capitals (Fig. 432-34).



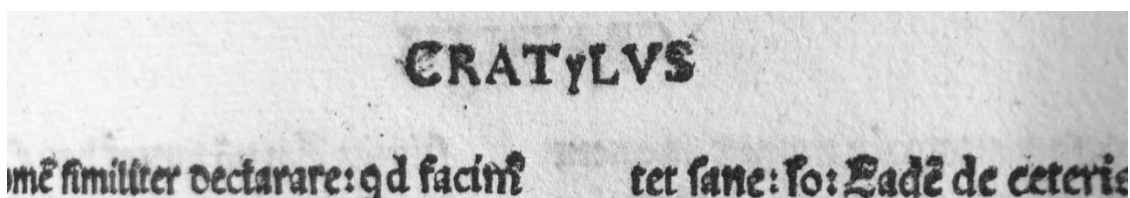
VNDECIMVS

Fig. 432



XLIII.

Fig. 433



CRATYLVS
me similiter declarare: qd facim' ter sane: fo: Eadē de ceteris

Fig. 434

Interpretation of the characteristics of the text and gazetteers

Although the characteristics of the regular text pages and the gazetteers are different, the nature of the irregularities and inconsistencies found, is comparable. Almagià also noted the specific typographical characteristics of the *Geography*. They supported his opinion about the existence of only one print run without interruptions.³⁴ He also believed that the *Geography* was produced in great haste. He connected this to an alleged dedication of the book to Sultan Mehmed II, who died in 1481 somewhat prematurely in relation to the publication of the *Geography*.³⁵ This haste was his explanation for all the inconsistencies and irregularities. Skelton has no explanation for the apparent carelessness that characterizes the work. His theory was that perhaps it had to be completed quickly before Berlinghieri left for Mantua in 1479.³⁶ Contrary to Almagià and Skelton, Veneziani believes that the *Geography* was not printed abruptly and in haste.³⁷ He assumed that frequent interruptions were the cause of the apparent sloppiness and imperfections, which could have been related to the difficult composition of the book. Another explanation by Veneziani is the in-between printing of other books. Our conclusion is that the flaws in the printing of the *Geography* should not be attributed to haste or interruptions. Berlinghieri started writing the *Geography* almost twenty years earlier. This does not suggest he was in a hurry. From our additional study of other books printed by Tedescho, it can be concluded that the inconsistencies must be considered as characteristic for material printed by Tedescho and indeed for books at the time. He was not able to perform to a higher standard. In his later production he did improve himself.

Several proofs of incorrect inking or corrections applied during printing were found regarding the guide letters and page numbering. Roediger already discovered that some of these errors were absent in some copies.³⁸ Additional examples of editing and corrections during printing were found such as the insertion of the toponym Thyle and the consequence thereof on the subsequent toponyms, as well as the corrections of the wrongly applied numbers SECVNDVS, SEXTVS, SEPTIMVS, and TERTIVS in respectively Liber Tertius, Quartus, Sextus and Septimus. The reverse printing of the letter Z can be explained by using a mirrored produced letter Z from an incorrectly manufactured matrix. Most of the inconsistencies and irregularities were randomly distributed over the different copies. We could not detect an exact moment at which the corrections were applied. The evidence suggests that the corrections for the different irregularities were executed ad hoc.

Table one shows an overview of the most striking inconsistencies found in the text and gazetteer pages. The atlases are presented group-wise per colour from left to right in a sequence based on the state of the maps found in the atlases and the watermarks. The colours have been applied in chronological order. Within each colour, the atlases are placed in a certain sequence. This is not a fully correct chronological order because that could not be determined reliably. It will be explained in more detail in chapter six about the maps. The atlases with first edition maps printed during the first print run are displayed in blue. Those with maps printed during the second print run are shown in green and the Giunti copies are depicted in different shades of grey. From top to bottom, the leaves are shown with the side, recto, or verso, on which the irregularities appeared. Black is used for the regular text pages and red for the gazetteers. The various types of inconsistencies present in the different copies are shown in black, blue, red and grey for those related to respectively the page numbers, the guide letters, the text and the headers. The table shows that some of these features are found in each copy. Others have been corrected during printing or do not appear in every copy as already described by Roediger. They seem to be randomly distributed among the different atlases with one exception. This concerns the atlases displayed in blue: these are the costly illuminated copies that were in possession of prominent persons. The text and gazetteer pages with the fewest errors with regard to the most visible irregularities at first sight, those

³⁴ Roberto Almagià, 'Osservazioni sull'opera geografica di Francesco Berlinghieri', *Archivio della R. deputazione romana di storia patria*, 68 (1945), pp. 216-17, 251.

³⁵ Sean Roberts, *Cartography between cultures: Francesco Berlinghieri's Geographia of 1482* (Michigan 2006), pp. 161-64; Sean Roberts, *Printing a Mediterranean world: Florence, Constantinople, and the renaissance of Geography* (London 2013), pp. 5, 26, 147; Almagià, op. cit. (n. 34), pp. 223, 226.

³⁶ Skelton, op. cit. (n. 1), p. VIII.

³⁷ Veneziani, op. cit. (n. 1), p. 200.

³⁸ Francesco Roediger, 'La geografia del Berlinghieri', *Il Bibliofilo*, 2 (1881), pp. 7-9.

in the headers, seem to have been selected for these atlases.³⁹ These copies also all contain gazetteers with the toponym Thyle present and with the correctly applied ASIA instead of DSID.

Based on the presence of these very specific characteristics consistently found throughout Berlinghieri's *Geography*, one may deduce that the entire text must have been consecutively typeset by one and the same person. We agree with Almagià that the text pages and gazetteers must have been printed in the intended number in one printing phase. If it had been printed in several stages spread over several years, as some scholars assume, the specific characteristics described would not have been present throughout the whole book. Even though the printing was not flawless, misprints were not discarded but equally used to compile the *Geography*. Their random distribution over the different copies will have come about during the gathering and binding.

A crucial point is the relation of different fonts to specific parts of the *Geography*. The regular text of Liber Quartus up to and including Liber Septimus, as well as Liber Primus and the first half of Liber Secundus, is printed with the font 115 R^a. For the second half of Liber Secundus, the complete Liber Tertius, and all the gazetteers, font 115 R^b was applied. Font 111 R^a is used for the text on the two unsigned preliminary leaves and on sig. a:1. Other fonts were found on the pages with the title and the register and colophon.⁴⁰ According to us the use of the different fonts must be related to the chronology of the printing.

The fonts and typesetting applied in the headers

We noticed some characteristics in the headers which made studying the words in the headers letter by letter worthwhile. By doing so, we discovered that the typesetting of the headers was different on the recto and verso of each leaf. We will elaborate a bit more on this, to avoid misunderstanding. The typesetting of the word LIBER was the same on the recto of each leaf of the regular text pages from a specific Liber (Fig. 435). The typesetting was also consistent on the verso of the regular text pages of each leaf from a specific Liber, but dissimilar to the recto (Fig. 436). The same applies to the number of the Liber printed following LIBER, for example SEPTIMVS (Fig. 437-38). Thus, two blocks of letters held or bound together forming the word LIBER and two blocks of letters also held or bound together forming the numbers PRIMVS to SEPTIMVS were alternately applied on the recto and verso of each leaf. This was done in a consistent combination of the word LIBER with one of the numbers.

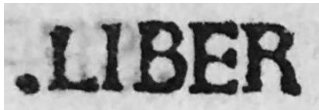


Fig. 435

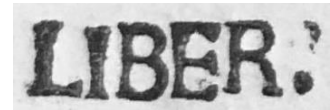


Fig. 436

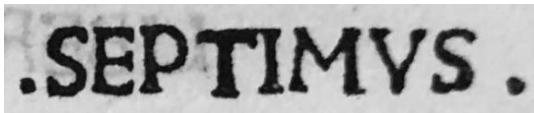


Fig. 437



Fig. 438

We discovered the same methodology regarding the headers in the gazetteers of Liber Quartus, Quintus, Sextus, and Septimus. Again, the typesetting was different on the recto and verso of each leaf. Additionally, in the gazetteers the typesetting of the words LIBER and the number, e.g., SEPTIMVS, was different compared to the typesetting of these words in the regular text pages of for example Liber Septimus (Fig. 439-42). Furthermore, the layout of the header on a page in the gazetteer differed from the layout of the header on a regular text page. The distance between the words LIBER and the number,

³⁹ Op. cit. (n. 34), p. 217; Consiglio regionale del Piemonte, Biblioteca Nazionale Universitaria di Torino, Centro Studi Piemontesi, Fondazione CRT, *Berlinghieri Geografia* (Torino 2006), p. 44; Roberts, op. cit. (n. 35), *Printing a Mediterranean world: Florence, Constantinople, and the renaissance of Geography*, p. 83; Berlinghieri was aware of the imperfections of his book, as his letters to Cem and Bayezid discussed in this book show. It seems that he made a selection of the best text sheets for the copies intended for high-ranking persons.

⁴⁰ Skelton, op. cit. (n. 1), pp. VII, IX.

e.g., SEPTIMVS, was found to be quite short on the regular text pages in all Libers compared to the one between these words in the gazetteers. There the distance is considerably larger (Fig. 443-44).

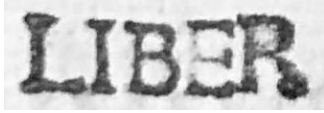


Fig. 439



Fig. 440



Fig. 441



Fig. 442

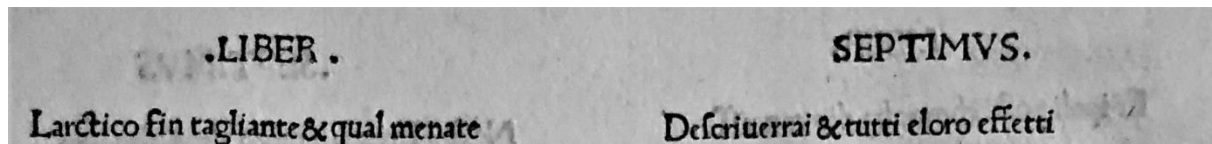


Fig. 443

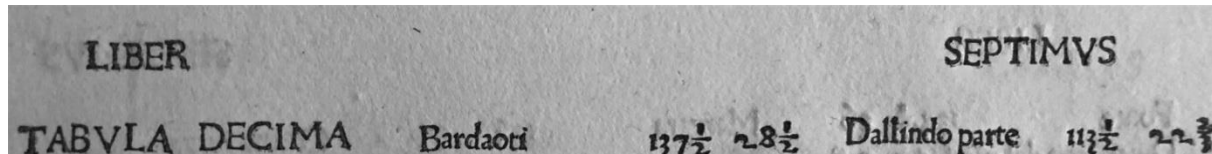


Fig. 444

We know that the font used for the regular text pages in Liber Quartus, Quintus, Sextus, and Septimus is not the same as the font used for the corresponding gazetteers. When the font changes in these Libers on the transition from text to gazetteer, the typesetting of the header changes as well. With this knowledge in mind, we took another look at the headers in Liber Secundus. We already know that halfway the regular text of Liber Secundus the font changes from 115 R^a to 115 R^b.⁴¹ The printing of the text pages must have been interrupted at this point.⁴² Given our findings, the typesetting of the header should change at the same point where the font changes. Our hypothesis was confirmed. The typesetting of the header on the recto and verso of the leaves, printed with font 115 R^b, differed from the typesetting of the headers in front of this page printed with font 115 R^a. Additional proof was found in the letter E of SECVNDVS. In the first half of Liber Secundus, the upper horizontal line of the letter E is printed with a damaged piece of type on the recto of each leaf (Fig. 445). On the verso of each leaf in the first half of Liber Secundus an undamaged E is printed in the header (Fig. 446).⁴³ In the second half of Liber Secundus, printed with another font, the damaged letter is no longer visible (Fig. 447-48). This is a logical consequence of the use of another font. Thus, another letter E in combination with a different typesetting

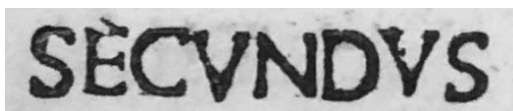


Fig. 445

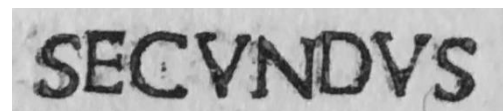


Fig. 446



Fig. 447



Fig. 448

⁴¹ Skelton, op. cit. (n. 1), p. VI; Veneziani, op. cit. (n. 1), pp. 201-02.

⁴² The header is lacking on the recto of this leaf of Liber Secundus, exactly there where the font changes. As if Tedescho forgot to apply the header when the printing of the text was continued.

⁴³ A comparably damaged capital E was found in the book *Disputationes Camalducenses* also printed by Tedescho. Apparently, he used blocks of letters for the headers, kept these together and reused them.

is used in the header on the verso and recto of each leaf in the second half of Liber Secundus. As the font did not change at the transition from the text of the second half of Liber Secundus to its gazetteer, the typesetting of the headers also remained the same. Only the distance between the word LIBER and the number SECVNDVS increased at the transition from text to gazetteer, as usual (Fig. 443-44).

Liber Tertius is the only Liber with the same font, 115 R^b, used for all the regular text pages as well as for the gazetteer.⁴⁴ Therefore, with the general rule in mind, no changes regarding the typesetting of the headers were to be expected in this Liber. This turned out to be the case, with one exception. An irregularity was detected in the application of the headers at the transition from the regular text to the gazetteer. In this Liber, the typesetting of the header present on the recto of the leaves with regular text (Fig. 449) was found on the verso of the leaves in the gazetteer (Fig. 452) and vice versa (Fig. 450-51). The order in which the blocks of letters forming the header were applied changed at the transition from the regular text pages to those of the gazetteer in this Liber. This indicates a break must have occurred after the printing of the regular text of Liber Tertius. The printing of the gazetteer must have taken place somewhat later with the headers applied in reverse order compared to the text. If the gazetteer would have been printed immediately following the text, the same order of the headers in the text and in the gazetteer had have to been found. As usual, the distance between the words LIBER and TERTIVS increased at the transition from the text to the gazetteer.



Fig. 449



Fig. 450



Fig. 451



Fig. 452

Yet another font, 111 R^a, was applied for the leaf with the title printed in black and the two preliminary leaves of the *Geography*.⁴⁵ Only the third leaf has a header, LIBER PRIMVS. We compared the typesetting of this header with the typesetting of the headers of the rest of Liber Primus, printed with font 115 R^a. The typesetting of the header on the third leaf, as well as the punctuation used for this header, was different from the typesetting of the headers applied in the rest of Liber Primus (Fig. 453-55). This provided further proof for the theory that the typesetting of the header changed right where the font changed.⁴⁶



Fig. 453



Fig. 454



Fig. 455

⁴⁴ Skelton, op. cit. (n. 1), p. VI; Veneziani, op. cit. (n. 1), pp. 201-02.

⁴⁵ Ibid.

⁴⁶ The used headers LIBER and PRIMVS were the same on the recto and verso of this leaf. This is obvious, as it is the only leaf with a header in combination with the font 111 R^a. It was not possible to print recto and verso on the same day, as the ink had to dry. Thus, only one header was needed and applied.

As is the case with almost everything in the *Geography*, some variations on the rule could be observed. On some pages the words LIBER and for example PRIMVS were printed conversely as PRIMVS LIBER as described earlier in this chapter. Nevertheless, the typesetting of both words was the same as the one on the pages with both words in the right order. This means that there was no question of a new variant of a header. The two words were only arranged in a different order. The same applies to the following deviations or inconsistencies. On the last few pages of the regular text of Liber Secundus, the dots, placed in front of and following the word LIBER, disappeared. In Liber Tertius the dot, in front of the word LIBER, also vanished at some stage on the regular text pages. The typesetting did not change. At some point in Liber Quartus, the punctuation changed from a colon in front of and following the word LIBER into a dot in front of the word LIBER, followed by a little slash. On the regular text pages in Liber Sextus, a small slash behind the word LIBER disappeared at a certain point, again without further changes to the typesetting. Obviously, when a page was set, the typeset around the block of letters forming the header was reset with or without different forms of punctuation and with lots of variations. Usually, when the punctuation marks changed, small variations with regard to the distance between the two words in the headers were observed. The described regularity with respect to the headers does not apply to those present in the gazetteer of Liber Quartus. Since SEXTVS instead of QVARTVS was used on up to three of the six pages, there is much less regularity to be found with respect to the headers in this gazetteer.

To conclude this subject we checked one more thing. We already described that in several gazetteers a wrong header was printed above the toponyms. In the gazetteer of Liber Tertius, the header LIBER SECVNDVS was found. In the gazetteer of Liber Quartus, the header LIBER SEXTVS was found, in the gazetteer of Liber Sextus, in one copy, the header LIBER SEPTIMVS was printed, and in the gazetteer of Liber Septimus, again in one copy only, LIBER TERTIVS was found. We compared the typesetting of these headers printed in the wrong Liber with those that were properly applied. They were identical. Therefore, we can conclude that there was no question of a new header. Obviously, at the top of the pages the typesetter erroneously used the already existing block of letters that was intended for another Liber (Fig. 456-57).⁴⁷

SEXTVS				
Vrbara	17 $\frac{1}{2}$	33 $\frac{1}{2}$	Catada in focc	39
Vladio: pro.	7 $\frac{1}{2}$	29 $\frac{1}{2}$	Castrametatio	33
Vilara	22	30 $\frac{3}{4}$	Cerbica	36
Salaco monte	16	31 $\frac{3}{4}$	Cercinna	39
Zaracha	23 $\frac{1}{2}$	30 $\frac{1}{2}$	Cherfonefo	38
Zalia in focc	6	34 $\frac{3}{4}$	Cilma	36
Silie	6 $\frac{1}{2}$	34 $\frac{1}{2}$	Cynipho infoc	4
Zuchabbati	16 $\frac{1}{2}$	32 $\frac{3}{4}$	Fonte	40
TABVLA SECVNDA			Coniunctio	4
DE APHRICA			Cisterne	4

Fig. 456

SEX TVS				
Throana	174 $\frac{3}{4}$	47 $\frac{3}{4}$	Dargamane in fonte	
TABVLA.VIII.DEDSID				
Alexandria in aria	110	36	Choa riceue in	114
Alexandria	114	31	Dista	107
Ambrodace	103 $\frac{1}{2}$	37 $\frac{3}{4}$	Daroacana	118
Arabi in focc	109	20 $\frac{1}{2}$	Draftoca	116
111 27 $\frac{1}{2}$	Diuerfio	107 $\frac{3}{4}$	Gammaca	116
El chui fonte	109	32 $\frac{1}{2}$	Gauzaca	118
Aracoto	118	30 $\frac{1}{2}$	Gilibi	111
Arana	111	28 $\frac{1}{4}$	Godana dogana	110
			Inna	100

Fig. 457

Interpretation of the characteristics of the headers

The findings regarding the headers confirm the observations about the fonts described by Skelton and Veneziani concerning the different parts of the *Geography* printed with the fonts 115 R^a, 115 R^b, and 111 R^a.⁴⁸ Exactly at the point where the font changed, the typography of the header changed. We can therefore firmly conclude that these fonts and their use have been correctly described by Skelton

⁴⁷ In the book *Disputationes Camaldulenses* Tedesco applied different blocks of letters forming the words LIBER and different blocks of letters forming the numbers PRIMVS to QVARTVS. The word liber was present on top of one page and the number on top of the opposing page. Only on the first page of each of the four libers the layout was the same as applied in the *Geography*. On these pages the word liber as well as the respective number were present in the header on top of the page with one exception. The header on the first page of Liber Tertius contains the word LIBER but the number TERTIVS is missing. We want to highlight another finding in LIBER QVARTVS. Only in this liber, on quite a range of pages, the word QVARTVS is consistently printed in the header on top of each page instead of Liber on one page and QVARTVS on the opposite page. The typesetting and the letters used to form the word QVARTVS differ from each other on the recto and verso of the consecutive leaves. Apparently, for this book Tedesco had two sets of letters that formed the word QVARTVS which he used alternately as in the *Geography*.

⁴⁸ Skelton, op. cit. (n. 1), p. VI; Veneziani, op. cit. (n. 1), pp. 201-02.

and Veneziani. Unfortunately, no header was applied on the pages with the title and the register and colophon. So, no extra information could be obtained about these pages. The consistent and alternating presence of the same header recto and verso on each leaf implies that the text and the gazetteers of the *Geography* were typeset and printed page by page. This is the only reasonable explication possible for the consistent presence of a particular type of header on the recto and of another type on the verso of each leaf. In the case of more pages being typeset at the same time or when more than one printing press would have been in use, more variation should have occurred.⁴⁹ This applies to the typesetting of the headers, as well as to the order in which Tedesco would have placed them on top of each page. This theory seems to be confirmed by the findings in the book *Disputationes Camaldulenses*.⁵⁰ On a considerable number of pages QVARTVS was consecutively printed instead of LIBER. Automatically, this led to the presence of a header with the same typeset of QVARTVS on the recto and one with the other typeset of QVARTVS on the verso of each leaf in this part of the book. This inconsistency is comparable with those found in the *Geography*. Therefore, it must again be concluded that they are characteristic of Tedesco's work and not a result of haste or an interruption of the printing process. Apparently, these elements were composed preprint and not disassembled when another font was introduced. This would explain the erroneous presence, in the identical typeset as applied in the appropriate liber, of SECVNDVS in LIBER TERTIVS, as well as of SEXTVS in LIBER QVARTVS, SEPTIMVS in LIBER SEXTVS and TERTIVS in LIBER SEPTIMVS.

Halfway through the regular text pages in Liber Secundus some remarkable changes occur simultaneously. Suddenly, the header is absent (Fig. 349). On the same page the font changes from 115 R^a to 115 R^b.⁵¹ Consequently, the typesetting of the headers in front of and following this page is different as well (Fig. 445-48). This combination of features was not found anywhere else in the *Geography*. It strongly indicates that, for some reason, at exactly that moment the printing process has been interrupted. At first sight, a seemingly less conspicuous transition takes place between the text and the gazetteer of Liber Tertius. At this point, the order in which the headers were used is reversed (Fig. 449-52). This is not plausible when one page per day was typeset, and the header alternately transferred to the newly typeset galley. It suggests that the printing of the text of this Liber was not immediately followed by the printing of its gazetteer. That would explain the application of the two headers in a different order in the text pages and in the gazetteer. One last noteworthy observation concerns the first regular text page of Liber Quartus. Together with the text page halfway Liber Secundus it is the only one without a header (Fig. 350). These findings will be further elaborated in the following section on the printing order.

Establishing the printing order

Working method

We have recorded the watermarks present in the text pages and gazetteers of in total 35 copies. With some exceptions we only found watermarks of a type called a cardinal's hat, in many different variants. From the pilot study we learned that some were clearly present and easy to distinguish. Others were sometimes badly visible and difficult to differentiate. To be able to score the different types of cardinal's hat watermarks quickly and reliably, we divided them into distinct and recognisable groups: 1 to 4 (Fig. 458-61).⁵² During our visit to the libraries in Milan and Turin we also tried to score the subtypes a, b, and c as shown in chapter four on the paper and watermarks. That turned out to be much more difficult, time consuming, and unreliable. The further analysis of this more detailed subdivision did

⁴⁹ Gutenberg printed one page at a time rather than one folio at a time. There were four printing presses used at various stages of the work. The pages printed by each press can be identified: David Woodward, 'The analysis of paper and ink in early maps: opportunities and realities', *Essays in Paper Analysis*, (Cranbury 1987), pp. 214-15.

⁵⁰ Op. cit. (n. 47).

⁵¹ Skelton, op. cit. (n. 1), p. VI; Veneziani, op. cit. (n. 1), pp. 201-02.

⁵² Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 1, p. 224, no. 3393; Bernstein, reference number CCI icpl.cci.XIV.068.a; WZIS, reference number DE4860-Ms1206_132; WZIS, reference number DE4860-Ms1206_112; Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 1, p. 224, no. 3387-3388-3390.

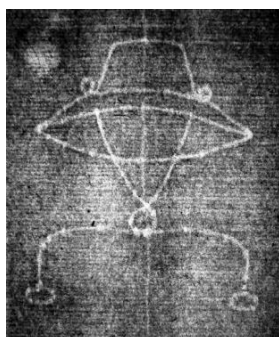


Fig. 458

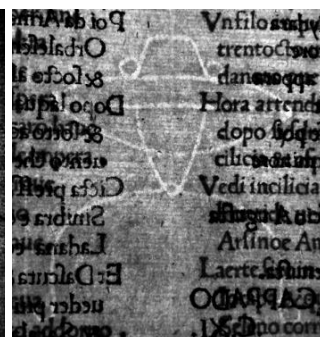


Fig. 459

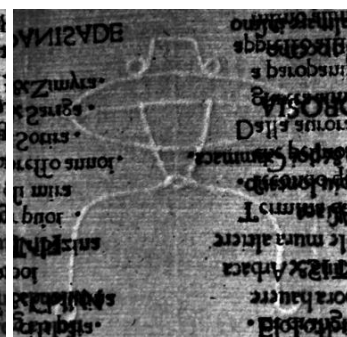


Fig. 460



Fig. 461

not provide any additional information. Therefore, this way of scoring was no longer applied. Almagià described that the paper for the text pages only contains the cardinal's hat watermark.⁵³ We detected three more watermarks in the regular text pages, those of the gazetteer and in the interleaves (Fig. 462-66). The watermark shearer scissors was found very incidentally and exclusively in the gazetteer of Liber Secundus.⁵⁴ The same applies to the crowned eagle watermark type 1a although a twin mould variant type 1b was present in an interleaf of another copy.⁵⁵ In just under half of the atlases a watermark depicting an ox was present.⁵⁶ It was always detected in the regular text pages of Liber Sextus or Septimus and several times in the gazetteer of Liber Septimus. To conclude, the watermark cardinal's hat type 6 was found in two fly leaves and an interleaf of one copy only.⁵⁷

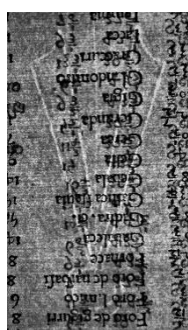


Fig. 462

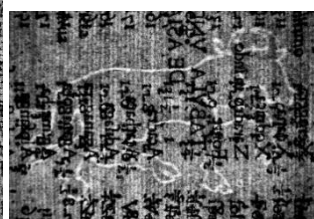


Fig. 463

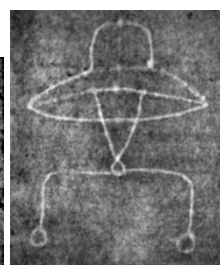


Fig. 464

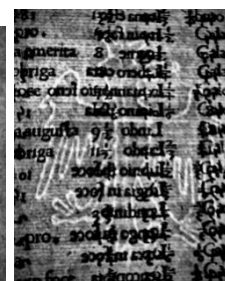


Fig. 465



Fig. 466

Explanation of table two a and b

The watermarks found in the frontispiece, all the regular text pages, and those of the gazetteers are displayed in the way they were present in the various atlases in accordance with the collation already described, including the interleaves and the page with the register and colophon. The fly leaves are not included because they were only found in a very few atlases. The maps are excluded for other reasons that will be made clear in the following chapter. All atlases were re-bound, sometimes in a different order as should be. We have corrected for this in our tables. The leaves of all atlases are presented in the correct sequence. This way, the watermarks found in the different leaves of each copy can be compared. As in table one, the atlases are presented from left to right in a chronological order based on the state of the maps found in the atlases and the watermarks. From top to bottom, all leaves are shown including the transitions from the frontispiece to the different libers, gazetteers, interleaves, and the page with the register and colophon. The colours light blue, black, red, brown, and purple are applied for respectively the leaves printed with font 111 R^a, 115 R^a, 115 R^b, the interleaves, and the page with the register and colophon. Below each atlas, the watermarks found in each leaf of the specific copy are displayed. The

⁵³ Op. cit. (n. 34), p. 219.

⁵⁴ WZIS, reference number DE5580-Codgraec71_VIII; Corpus Chartarum Fabriano, reference number Zo1234-5.

⁵⁵ Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 1, p. 24, no. 92; Corpus Chartarum Fabriano, reference number Zo1231-2, Zo1251.

⁵⁶ WZIS, reference number DE5580-Codgraec258_136.

⁵⁷ WZIS, reference number IT5235-PO-32312; Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 1, p. 224, no. 3391.

numbers 1 to 4 apply to different types of the watermark cardinal's hat which were the most found (Fig. 458-61). The word missing is used in case a leaf was not present in that atlas. A dash was applied in case no watermark was detected in a leaf. The letters CE, SS, and O, as well as the number 6 were employed for the watermarks a crowned eagle, shearer scissors, ox, and the cardinal's hat type 6 (Fig. 462-66). The green cubes indicate the leaves in which other watermarks were found than one would expect based on the watermarks in the preceding and following leaves. In the line to the right of these cubes the same green colour was applied for these so-called deviating watermarks. In table two b, the composition of one atlas is repeated twice in four columns but modified. In the two columns at the left the regular page order is displayed except for the interleaves. They were added at the very bottom of these two columns because they were inserted after printing. In the two columns at the right the order is shown in which the pages were printed according to us. Again, the interleaves are positioned at the bottom of these two columns for the same reason.

A general impression

The overall view of table two a shows that the use of paper is similar in all atlases. It can be concluded from this that the text pages have been printed in the desired number of copies from the onset. The table shows several striking colour transitions from top to bottom, in particular and repetitive from the regular text to the gazetteers and back again.⁵⁸ Mostly, they concern a change in the applied font. That might be understandable given the fact that in the gazetteers a special type was needed to print the numbers and fractions of the coordinates belonging to the toponyms. However, the observation that at most of these transitions the paper usage also changed abruptly, as shown by the different numbers representing the different types of the cardinal's hat watermark, requires further explanation. A working method with a very precisely applied use of different stocks of paper to print regular text pages and gazetteers separately is highly improbable. The printer will not have considered to use a sheet of paper from a certain stock of paper for the regular text and from another stock for the gazetteer. Additionally, it is implausible that he would have succeeded in performing this way of working as regularly and consequently from start to finish as shown. In table two b, we display the order in which the pages were printed. According to us, the printing of the *Geography* started with Liber Quartus. The four reasons that substantiate this are the applied page numbering, the discovery of text printed in red in one copy only, the use of paper based on the watermarks, and lastly the different fonts including the order in which they must have been applied. In the following paragraphs we will substantiate the start at Liber Quartus and the subsequent printing order in this sequence step by step and in detail.

The page numbering

The page numbering applied in Berlinghieri's *Geography* appears to be illogical at first sight. The pagination starts in Liber Quartus with a single lowercase letter followed by a number in lowercase Roman letters, for example, .a.i.. This was continued up to and including Liber Septimus until the letter f. In Liber Primus, the pagination changed from one to two lowercase letters, for example, .aa.ii.. The use of double lowercase letters was pursued in alphabetical order up to and including Liber Tertius. As mentioned before, we also studied other books printed by Tedescho, like for instance Dante's *La Divina Commedia*. In this book, the page numbering starts with single lowercase letters followed by a number in lowercase Roman letters, e.g. a.iii.. According to Veneziani, this was the common way of page numbering in those days.⁵⁹ This is followed by page numbers composed of two lowercase letters followed by a number, e.g., aa.iii. This practice was continued using a single capital letter followed by a number, A.iii. Then two capital letters and a number were applied, AA.iii., and so on.⁶⁰

⁵⁸ In other words, the paper used changes, at the same spot where the font changes from 115 R^a to 115 R^b and vice versa.

⁵⁹ Veneziani, op. cit. (n. 1), p. 201.

⁶⁰ Ibid, p. 201; Different methods of page numbering were found in other books printed by Tedescho. In the book *Monte Santo di Dio* from 1477, the pages were numbered by lowercase letters followed by a number, for example e.ii. In the book *Regola della Vita Spirituale* printed by Tedescho in 1477, no page numbering was applied. In his 1482 edition he used a single letter, occasionally in the wrong order and sometimes he omitted a letter. In the 1483 edition single lower case letters followed by a number were present like b.ii. In the book *De re aedificatoria* the same procedure was followed for the letters a to z. Then special characters such as the

The applied method of page numbering in the *Geography* can be considered as a depiction of the sequence of printing. As the page numbering in the *Geography* starts with the use of a single lowercase letter followed by a number in Liber Quartus, the conclusion that printing of the *Geography* started with Liber Quartus seems appropriate. This way of page numbering was continued up to and including Liber Septimus. Thus, it may be concluded that these Libers were printed following Liber Quartus. In Liber Primus, the page numbering changes to the use of two lowercase letters followed by a number, up to and including Liber Tertius. Continuing this approach, Liber Primus, Secundus, and Tertius must have been printed later. In the gazetteers no page numbering was found. Therefore, no conclusions can be drawn regarding the gazetteers based on the page numbering. Veneziani also considered it strange that the page numbering in the *Geography* was divided in two and in an illogical order, first double lowercase letters followed by the use of single lowercase letters. In his opinion that could not be due to a lack of letters. At the time it was common for Florentine printers to start the pagination with single lower-case letters.⁶¹ Veneziani therefore believes that Liber Quartus up to and including Liber Septimus were printed first. The question remains, why printing started with Liber Quartus. Veneziani suggests that the first three Libers were not available. He suspects that they were with the copyist of one of the two manuscripts. We consider this to be very plausible. Veneziani also suggests that a part of the *Geography* may have even been printed before Dante's *La Divina Commedia* by Landino. The other part might have been printed afterwards.⁶² Further on we will show that this assumption can be rejected based on the watermarks.

Text printed in red

In one copy a special feature was found. Only in this specific copy we found the first lines of Liber Quartus printed in red, instead of black ink (Fig. 467-68). It was the only copy found with text printed in

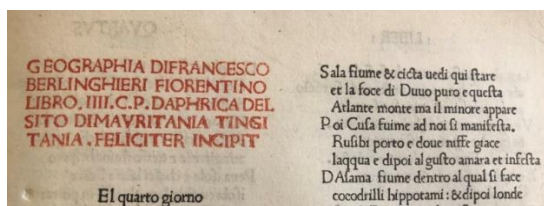


Fig. 467

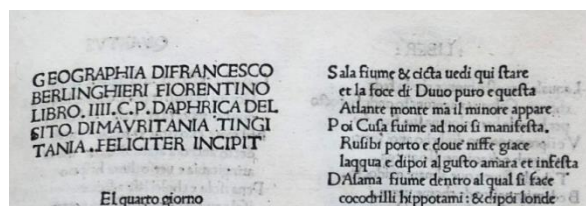


Fig. 468

red.⁶³ Remarkably, the layout of this page is exactly as that of the same page printed in black in all other copies. Therefore, the galley with type must have been inked with two different inks at the same time. Locally with red ink while black ink was used for the rest, which must have been a precise and labour-intensive procedure. It also meant that two colours of ink had to be made. The raw material for the red ink was probably the mineral cinnabar. The use of lead menia was more common in the sixteenth century.⁶⁴ Cinnabar was not only much more expensive as a raw material, but the further processing was also more costly, as it had to be ground. One would expect such an experiment in relation to printing at the beginning of a book, instead of halfway.⁶⁵ This would appear strange, but is in fact the case. Based on

& and a mirrored c followed by the number i were used. In the book *Disputationes Camaldulenses* the page numbering starts with single lowercase letters followed by a number in lowercase Roman letters. This is followed by page numbers composed of two lowercase letters followed by a number, for example aa.iii., similar to the method applied in the *Commedia*. However, in contrast to the *Commedia*, at the end of the book *Disputationes Camaldulenses* Tedesco changes the page numbering back to single lowercase letters. In this work an example of the wrong alphabetical order was found also. In some smaller *oratio*s printed by Tedesco, pages were numbered as i, ii, iii and so on. Although, different methods of page numbering were used by Tedesco, they were always applied in a logical order, apart from some errors, mistakes, and inconsistencies characteristic for his work. No example of page numbering with the application of two lowercase letters at the beginning of a book and one lowercase letter further on, as applied in the *Geography*, was found.

⁶¹ Veneziani, op. cit. (n. 1), p. 201.

⁶² Ibid, pp. 202-03.

⁶³ Biblioteca Nazionale Braidense Milano, shelfmark AK.XVI.12.

⁶⁴ We found *cinabro* between the dyes used by the printing office in the diary of the Ripoli monastery. Obviously, it was in use in Florence around 1480; Emilia Nesi, *Il diario della stamperia di Ripoli* (Firenze 1903), p. 59.

⁶⁵ In the book *Disputationes Camaldulenses* by Landino the first few lines of Liber Primus are also printed in red including the header. It was printed by Tedesco not after September 12, 1481, according to the Gesamtkatalog Wiegendrucke M16839. In this

the page numbering this was the first printed page. Probably, either Berlinghieri rejected the further application of red ink, or Tedesco was forced to do so by other factors. Costs may have played a role, but he also may not have liked the result. Out of frugality and in accordance with other pages with errors and imperfections, nothing was discarded. This explains why we could discover this page. It further shows how valuable and costly paper was and indicates that imperfections in these early days of printing were accepted.

Gutenberg was the first to print text in red in some copies of his *Biblia Latina* (ca. 1452-55). In other examples of this book the red is applied by hand. It is suggested by Stijnman that Gutenberg did not achieve a satisfactory working method. The red ink was relatively expensive and extra labour was required.⁶⁶ It was cheaper, easier, and faster to colour by hand in red where necessary. Fust and Schöffer managed to print in black and red in the 1457 Mainz Psalter. In addition, they were the only of the first generation of printers to print in blue ink. However, it was only applied for the decorative initials.⁶⁷ It is estimated that only fifteen percent of incunabula have text printed in red.⁶⁸ So it was quite innovative and still somewhat experimental for Tedesco to be printing in red. In the book *Horae Beatae Mariae Virginis* from 1483, he even managed to print parts of text in red and black on one and the same page.

Many years later red ink was applied by Giunti for the title in red on the recto of the frontispiece with the title printed in black on the verso (Fig. 469). By this time, the printing in red and black had become a common practice. Pettas, in his book about the Giunti office, described that sometimes new

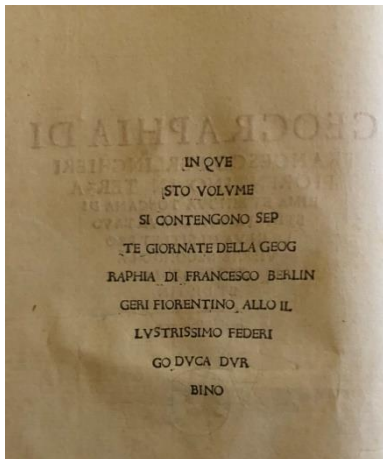


Fig. 469

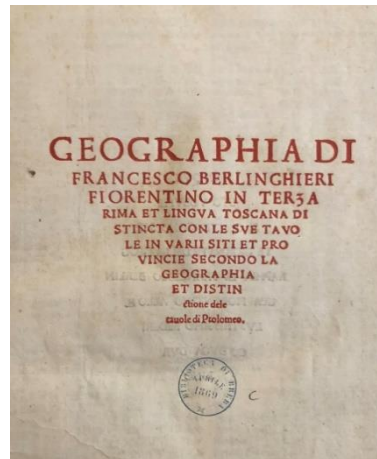


Fig. 470

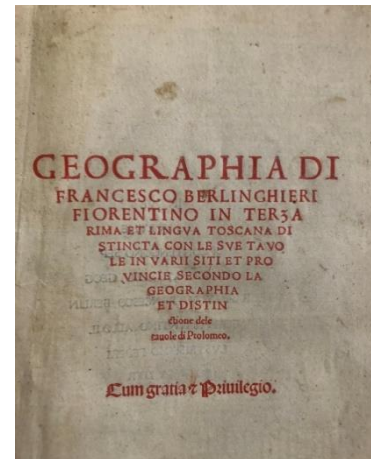


Fig. 471

title pages were printed in the event of takeovers or damage.⁶⁹ This practice was also described in an article by Rhodes and Hellinga.⁷⁰ They discovered examples, contemporary with the *Geography*, of buying up unsold leaves of different books, probably at least fifteen years after they had been printed. The first page of these books originally was left blank. The books were then reissued with new titles, added in new types on the recto of this leaf.⁷¹ This also applies to the *Geography*. Veneziani and Skelton described that the fonts used to print the title in red date from about 1516.⁷² In that period they were in use in Giunti's printing office. We have found a variation concerning the text of the title in red in a copy where the bottom line "cum gratia & privilegio" is missing. Possible explanations are that it was initially

book he applied red ink on the first page of the first liber which is much more plausible. Tedesco applied the red ink also on the first printed page of the *Geography*; In the book *Horae Beatae Mariae Virginis ad usum Ecclesiae Romanae*, printed July 5, 1483, Tedesco applied two colours, red and black, on the different pages throughout the complete book. Thus, the book must have been printed in two print runs, one for each colour. It shows Tedesco had learned or was capable to apply this technique.

⁶⁶ Ad Stijnman, 'Part 1 An introduction to colour in printmaking 1400-1700', *Printing Colour* (Leiden 2015), p. 24.

⁶⁷ Mayumi Ikeda, 'Part 2 The Fust and Schöffer office and the printing of the two-colour initials in the 1457 Mainz Psalter', *Printing Colour* (Leiden 2015), p. 65.

⁶⁸ Margaret Smith, Alan May, 'Early two-colour printing', *Bulletin of the Printing Historical Society* 44 (Winter 1997), 1; as cited in Ad Stijnman, 'Part 1 An introduction to colour in printmaking 1400-1700', *Printing Colour* (Leiden 2015), p. 25.

⁶⁹ Pettas, op. cit. (n. 26), p. 181.

⁷⁰ Dennis E. Rhodes, Lotte Hellinga, 'Cornelis de Zyrickzee and his practice of reissuing incunables from other presses', *Quaerendo*, 9 (1979), pp. 143-48.

⁷¹ We found additional proof in the maps which show Giunti also reprinted the maps for these reissues.

⁷² Skelton, op. cit. (n. 1), p. IX; Veneziani, op. cit. (n. 1), p. 206.

forgotten and later added or that it was inadvertently removed from the galley or even left uninked (Fig. 470-71).⁷³ To conclude, it is interesting to note that Berlinghieri's *Geography* was still listed as stock of the Giunti's at the beginning of the seventeenth century.⁷⁴

Paper

A few things can be deduced from the paper use. Nesi and Conway described in their books about the diary of the printing office of San Jacopo di Ripoli frequent orders, deliveries, and payments for substantial amounts of paper, regularly several times a week and sometimes even on consecutive days or the same day.⁷⁵ Ross King described that already in the days of Vespasiano da Bisticci eight booksellers were active in the Via dei Librai in Florence. Among other things, they sold paper in all shapes and sizes that they bought from paper mills in the region, as mentioned in chapter four on the paper and the watermarks.⁷⁶ So, at the time it seems to have been customary to obtain paper from *cartolaio's* or workshops in Florence as already described in chapter four. Furthermore, there seems to be a relationship between the paper applied for the maps and the text.⁷⁷

Transitions detected based on paper use and watermarks

The two columns at the right of table two b show that paper with the watermark cardinal's hat type 2, 3 and 4 was used to print the regular text of Liber Quartus up to and including Liber Septimus, Liber Primus and the first half of Liber Secundus. The break between the first and second half of this last liber is of interest. We have singled out this spot because of its unique characteristics. Here, the font changes abruptly from 115 R^a to 115 R^b, including the change in the typesetting of the header as described earlier.⁷⁸ Additionally, at the same point the only clear change in the paper used occurs. After this transition the regular presence of the watermark cardinal's hat type 2 and 3 disappears. From that point on we only find the types 1 and 4. A little further, type 1 is almost exclusively present, and type 4 reappears at the end. Apparently, another stock of paper was used before and after this transition halfway Liber Secundus.

All other transitions in this column of table two b concern a change in colour, which means a change in the font used. The first change of font is the most remarkable. It appears at the transition of the regular text pages of Liber Septimus to those of its gazetteer. It shows a transition in the applied font but not of the used paper. Therefore, the text and gazetteer of Liber Septimus must have been printed consecutively. This can be concluded from the watermarks detected, especially the watermark ox. This watermark was exclusively present in the paper used to print the regular text pages of Liber Sextus, Liber Septimus, as well as the gazetteer of Liber Septimus.⁷⁹ Additionally, the different types of the cardinal's hat watermark found in the gazetteer of Liber Septimus correspond with those present in the regular text of this Liber. This constitutes strong evidence for the printing of the text and the gazetteer of Liber Septimus on the same batch of paper. The next change in colour or font occurs at the transition from the gazetteer of Liber Sextus to the frontispiece and the first two preliminary leaves. Again, the paper used does not change. In this specific copy, represented in these last columns of table two b, only the watermark cardinal's hat type 4 was present in these leaves but in several other copies type 1 was found as well before and after this transition. The next transition is from the preliminary leaves to the leaf with

⁷³ Biblioteca Nazionale Braidense Milano, shelfmark AM.XV.36 with the *privilegio* missing and shelfmark AK.XVI.12 including the *privilegio*. We discovered this only at a later stage and could not check the copies of which we had no photos. This leaves the possibility that it will occur in more than one copy.

⁷⁴ Roberts, op. cit. (n. 35), *Cartography between cultures: Francesco Berlinghieri's Geographia of 1482*, p. 118.

⁷⁵ Melissa Conway, *The diario of the printing press of San Jacopo di Ripoli 1476-1484* (Firenze 1999), pp. 17, 46, 268-72, 276; Nesi, op. cit. (n. 64), pp. 27-8, 104-08, 112; The cities of origin of the paper mentioned in the diary were Prato, Colle, Fabriano, and Campo Corbolini, Nesi, op. cit. (n. 64), p. 59; Conway, op. cit. (n. 75), pp. 327-31.

⁷⁶ King, op. cit. (n. 15), p. 13; Op. cit. (n. 26), p. 150.

⁷⁷ This is based on the use of several spare leaves of paper, a remainder from a batch of paper applied for the maps, for the printing of some pages of a gazetteer after the break halfway Liber Secundus. It will be clarified in chapter six on the maps.

⁷⁸ Skelton, op. cit. (n. 1), p. VI; Veneziani, op. cit. (n. 1), pp. 201-02.

⁷⁹ It was found only once in each copy with one exception where it was present twice, once in the regular text leaves of Liber Sextus and once in the gazetteer of Liber Septimus; Biblioteca Nazionale Braidense Milano, shelfmark AM.XV.36.

the register and colophon. In the same copy, this sheet contained no watermark but type 4 was found in most of the other leaves with the register and colophon. Based on the watermarks this implies that these parts of the *Geography* were also printed consecutively, comparable to the regular text and gazetteer of Liber Septimus. We can therefore conclude that in the established printing sequence the paper consumption is very regular, apart from the break halfway through Liber Secundus. The interleaves have been disregarded here, as they were added after printing.

The use of spare leaves

The green cubes in table two a and b point to the leaves in which watermarks were present at locations where they were not expected to be found. This is based on those present in the preceding and following leaves. Before the presence of these deviating watermarks can be explained, we need to clarify a detail about printing in those days. The paper that was needed on a certain day, was moistened the day before. This was done to make the paper adjust itself better to printing. A spare stack of paper was prepared separately in case something went wrong or if the printers fell short of paper for some reason. By doing this, spare paper from another batch might be used to print several leaves.

The text pages and gazetteers of the *Geography* were printed in two parts, before and after the break halfway Liber Secundus, as already explained. For each of these parts different stocks of paper were used. First, the deviant watermarks in the paper of the text pages printed before the break with font 115 R^a and represented by the black colour will be discussed. Next, those found in the text pages of the *Geography* printed with font 115 R^b after the break and represented by the red colour will be explained. No so-called deviating watermarks were found in the paper printed with font 111 R^a in the copies studied.

Paper with the watermark cardinal's hat type 2 and 3 was used to print the regular text pages of Liber Quintus. In two copies in leaf 84, the first regular text page of Liber Quintus, the watermark cardinal's hat type 4 was found. This type of watermark was also present in the regular text pages of Liber Quartus. Thus, its appearance here is explainable. In one copy the watermark cardinal's hat type 1 was

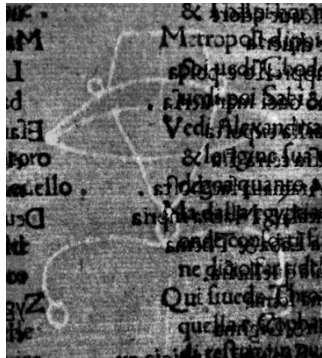


Fig. 472

present in leaf 85, in another copy in leaf 97. This type of watermark was not expected there. In the paper used for the regular text pages of Liber Sextus, the watermarks cardinal's hat type 2, 3 and 4 were found as a rule. However, in seven copies, the watermark cardinal's hat type 1 appeared in paper used for the leaves 108 and 109. We have images of five of them and discovered something special regarding three of them. These three represented the variant 1d3 of the cardinal's hat type 1, not found anywhere else in the paper used to print Berlinghieri's *Geography* (Fig. 472). For the paper used to print the regular text pages of Liber Primus, again paper with the watermark cardinal's hat type 2, 3 and 4 was used (Fig. 459-61). In only two copies, in the leaves 6 and 12, the deviant watermark cardinal's hat type 1 was present again.

The question arises as to where this paper comes from. A logical thought seems to be it might have been paper used for the part of the *Geography* printed with font 115 R^b. However, that stock of paper was not yet available. As mentioned before, we also studied several copies of Dante's *La Divina Commedia*, printed by Tedescho in 1481. The same size of paper as used for this edition of Dante, was applied for Berlinghieri's *Geography*. In the copies of Dante's *La Divina Commedia* studied, we exclusively found the watermark cardinal's hat in different variants. All variants of the watermark cardinal's hat type 1 and 4 were omnipresent in *La Divina Commedia*. This indicates that after printing the *Commedia* some left over paper was used to print a few pages of the *Geography*.

With this explanation in mind, the deviant watermarks in the second part of the *Geography*, printed with font 115 R^b appear easy to explain. The first example was found in ten copies in the paper used for leaf 27, in the second half of Liber Secundus. Eight of them contain the watermark cardinal's hat type 3 and two type 2. In fourteen copies, in one copy twice, the watermark cardinal's hat type 4 was present in the regular text pages of Liber Tertius. This was the case for the leaves 45, 48, and 52, respectively five, eight, and two times. Normally, the watermark cardinal's hat type 1 was found in the paper used for these leaves. These examples must originate from left over paper used to print the first

part. Comparable with the first printed part of the *Geography*, it concerned a limited number of specific leaves in some copies only. This confirms the use of spare leaves of paper. It was only implemented in case something went wrong or when Tedescho was short of a few leaves. Some other deviating watermarks in the second part of the *Geography* were found in the gazetteer of Liber Secundus, to be specific in the leaves 32 and 33. Two of them were in accordance with those already described. It concerned the presence of the watermark cardinal's hat type 4, once in leaf 32 and once in leaf 33, where type 1 was expected. Additionally, the watermark of a crowned eagle was found in these leaves, in each of them once (Fig. 465). The next deviating watermark detected was present in the same leaves. It concerned the watermark shearer scissors (Fig. 462). It was found in one copy in leaf 32 and in two copies in leaf 33. This shearer scissors watermark was also present in the paper used to print some maps of the *Geography*.⁸⁰

The last deviant watermark we want to discuss concerns an ox. In three copies it was present in Liber Sextus, once in leaf 107 and twice in leaf 110. It was also found in the regular text pages, as well as in the gazetteer of Liber Septimus. In this Liber the ox was detected more often, six times in leaf 118, once in leaf 124 and five times in leaf 125 (Fig. 196-97, 473). Several variants of the watermark ox were also found in the book *Monte Santo di Dio* from Antonio da Siena printed by Tedescho in 1477 (Fig. 474-75). According to us one of them is identical to the variant of this watermark present in the *Geography* although we must be cautious because it was not present in its entirety in the book *Monte Santo di Dio*. A time gap of five years corresponds to the life span of a watermark as described in the previous chapter. Paper with other variants of the watermark ox was detected in the book *Moralia in Job* printed by Tedescho after the *Geography*. It may concern paper from another batch from the same manufacturer.

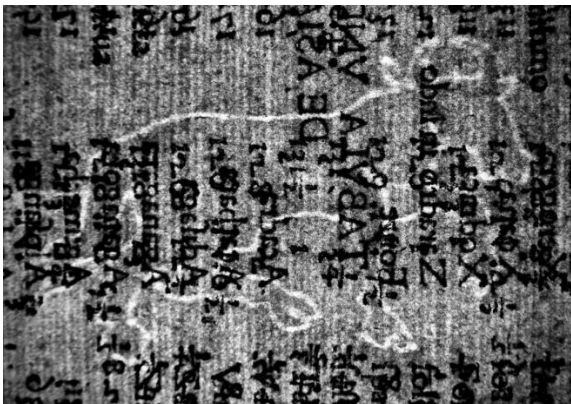


Fig. 473

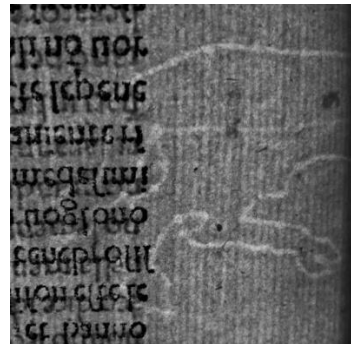


Fig. 474

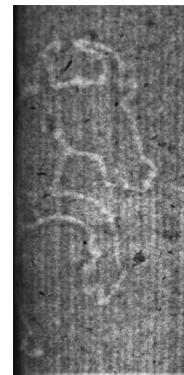


Fig. 475

The fonts in relation to the chronology

According to Skelton, type 115 R^a was apparently in use prior to 1481. Type 115 R^b was presumably made for *La Divina Commedia* which was completed on August 30, 1481. Type 111 R^a was in use in 1482, 1483 and apparently later. The earliest dated book in which it is found, is of October 22, 1482.⁸¹ We assume this must concern the 1482 edition of the book *Regola della vita spirituale* by Cherubino da Siena. Obviously, BMC based all this on the presence of these fonts in books printed by Tedescho. In our opinion they neglected the fact that a font can also have been applied later. In the order in which the book was compiled, presented in table two a, the applied fonts change repeatedly from top to bottom. It is highly unlikely that the book came about this way. The printing order we determined is presented in the columns at the right of table two b. It shows a smooth transition of the fonts from 115 R^a to 115 R^b, ending with 111 R^a from the beginning to the end of the *Geography*, which seems logic. The font, used to print the title in red, is already described earlier in this chapter. For the page with the register and colophon a fourth font has been used. The details of this page will be discussed at the end of this chapter.

⁸⁰ In chapter six on the maps the presence of the paper with these watermarks in the gazetteer of Liber Secundus will be clarified.

⁸¹ Skelton, op. cit. (n. 1), p. VI.

The gazetteers contain the coordinates of the toponyms which are a combination of letters and all kinds of numbers and fractions. We assume a set of type with fractions had to be made. We are of the opinion that the fractions were not ready yet at the start of printing. This can be deduced from the first page of the gazetteer of Liber Quartus. In all copies studied, the first page of the gazetteers of Liber Tertius and Quartus are the only ones present in the *Geography* with regular text and gazetteer combined on the same page. In Liber Tertius only one font, 115 R^b, is used for the complete page. No difference in the colour of the ink could be determined between the regular text and the gazetteer of this page in the copies studied. Further, the layout of this page is always the same. In contrast, the layout of the first page of the gazetteer of Liber Quartus differs between the copies studied. It begins with a few lines of regular text before the gazetteer starts. We frequently found a different orientation in all directions of the regular text block compared with the orientation of the gazetteer (Fig. 476-77). The vertical distance between the regular text block and that of the gazetteer in the left column varies in the copies studied. The same applies to the vertical position of the regular text in the left column, in relation to that of the gazetteer in the right column. Further, differences in print quality and ink were frequently detected between the regular text and the gazetteer on this page. The font 115 R^a was used for the regular text, whereas the font 115 R^b was applied for the gazetteer on this page. The only possible explanation for these characteristics is that this leaf of paper has gone through the printing press twice. Firstly, the regular text was printed including the word LIBER in the header and the second time the gazetteer was printed including the word QVARTVS or erroneously SEXTVS in the header (Fig. 368-69). This way of working was laborious and also led to a less desirable result regarding the final layout of this page. If the fractions had been available, the regular text and the gazetteer on this page would have been typeset together and printed in one run. Tedescho could also have decided to print this page all over again with font 115 R^b. Possibly, the cost of paper withheld him from doing so. Another observation regarding this sheet of paper concerns the watermarks. The presence of the watermark cardinal's hat type 2, 3, and 4 in the paper used for this leaf are shown in table two a. These are also found in the regular text pages of this Liber. In the other leaves of paper used for the gazetteer of Liber Quartus only the cardinal's hat type 1 and 4 are present. The same applies to the gazetteers of Liber Quintus and Sextus. Therefore, this page is important in relation to the order of printing. It confirms that the regular text on this page was printed first and subsequently to the rest of the regular text of Liber Quartus. The second print run with the gazetteer was executed later, together with and followed by the rest of the gazetteer of Liber Quartus.⁸²

LIBER.		QVARTVS.	
Et elephanti tutti albi & non pigri.	Benta	9 ¹ / ₂	17 ¹ / ₂
Iueta a latera ignota regia magna	Byro monte	10 ¹ / ₂	17 ¹ / ₂
de qua Agryba de etiohi nati.	Erinfista	12 ¹ / ₂	18 ¹ / ₂
Ha querta region per lacampagna	Iocano	9 ¹ / ₂	19 ¹ / ₂
& choe alfa & degne della buftoria	Buitta colle	13 ¹ / ₂	19 ¹ / ₂
fin che latera ignota lacampagna	Bunbora	14 ¹ / ₂	19 ¹ / ₂
Delle umete alla noftia memoria	Bura	16 ¹ / ₂	19 ¹ / ₂
uedi lon monte, & poi Dauchi monte	Buzara monte	17 ¹ / ₂	20 ¹ / ₂
& eplia & Melchi monti diu glia	Gauio	16 ¹ / ₂	21 ¹ / ₂
Bardeto & lairo che fuode infonfe.	Carecina	16 ¹ / ₂	21 ¹ / ₂
frezzano quattro parti alla ofale polo	Carepula	14 ¹ / ₂	21 ¹ / ₂
della diu de terech noto auci choro	Caremino in fode	14 ¹ / ₂	21 ¹ / ₂
Omen cinque dodecimi duo felo,	Cafinari	18 ¹ / ₂	21 ¹ / ₂
	Cattinna	14 ¹ / ₂	21 ¹ / ₂
	Caftia	14 ¹ / ₂	21 ¹ / ₂
	Cedama	12 ¹ / ₂	21 ¹ / ₂
	Cylichem in fode	11 ¹ / ₂	21 ¹ / ₂
	Cinnaba monte	19 ¹ / ₂	21 ¹ / ₂
	Ciffa	12 ¹ / ₂	21 ¹ / ₂
	Irath	17	21 ¹ / ₂
	Izath telara ifula	17 ¹ / ₂	21 ¹ / ₂
	Izath	19 ¹ / ₂	21 ¹ / ₂
	Labida	19 ¹ / ₂	21 ¹ / ₂
	Lagnuno	19 ¹ / ₂	21 ¹ / ₂
	Lamida	18 ¹ / ₂	21 ¹ / ₂
	Lanigara	12 ¹ / ₂	21 ¹ / ₂
	Lix	6 ¹ / ₂	21 ¹ / ₂
	Lix in fode	6 ¹ / ₂	21 ¹ / ₂
	Madedatidano	11 ¹ / ₂	21 ¹ / ₂
	Malua in fode	12 ¹ / ₂	21 ¹ / ₂
	Manilana	19 ¹ / ₂	21 ¹ / ₂
	Metengonze.pro.	10 ¹ / ₂	21 ¹ / ₂
	Myfocara porto	7 ¹ / ₂	21 ¹ / ₂
	Minaara	12 ¹ / ₂	21 ¹ / ₂
	Modangna	19 ¹ / ₂	21 ¹ / ₂
	Molochath	19 ¹ / ₂	21 ¹ / ₂
	Molochath in fode	19 ¹ / ₂	21 ¹ / ₂

Fig. 476

[illegible]

Fig. 477

As already mentioned, the fractions needed to print the coordinates in the gazetteer were not ready at the start of printing. They became available at the time Liber Septimus was printed. The applied font changes from 115 R^a for the regular text of this Liber to 115 R^b for its gazetteer. It was consistently used for all the gazetteers. Possibly, for some unknown reason font 115 R^b may have been better compatible with the type of the fractions. That would explain the transitions. That the fractions became available during the printing of Liber Septimus, was deduced from the fact that the gazetteer of this liber was printed consecutively to the regular text pages. This can be derived from the watermarks, especially the rarely found watermark ox as described earlier.⁸³ Tedescho continued printing the regular text pages

⁸² This explains why in table two b the leaves of the gazetteer of Liber Quartus are not found together but separated in the right column of this table. This first leaf was printed earlier together with the other text pages of this Liber.

⁸⁹ This also proves that both fonts 115 R^a and 115 R^b were in use during the same period and after 1481 in contrast to what Skelton suggested.

with font 115 R^a until the break halfway Liber Secundus. The reason why he did not apply font 115 R^b directly after Liber Septimus instead of only halfway Liber Secundus remains a mystery.⁸⁴ We also have no explanation for the fact that Tedescho started printing the *Geography* with font 115 R^a and later switched to font 115 R^b. Both were available at the start of printing.⁸⁵ Earlier in this chapter we described that he did not seem to have issues with the use of different fonts and upper and lowercase letters mixed. From the application of several fonts on the same page in the *Geography* as well as in Dante's *La Divina Commedia*, it might be deduced that it did not bother him. Perhaps also because the two fonts are very similar. Therefore, we assume that the transition from font 115 R^a to R^b at the break halfway Liber Secundus was not a problem or point of consideration for Tedescho. Possibly, after the break he proceeded with font 115 R^b for the regular text just because he still had to print the gazetteers where for some reason the fractions were consistently applied combined with this font for the letters.

The use of yet another font 111 R^a for the first three leaves, with the title and the index of regions and larger islands, might be related to the use of the many Roman numerals in large format for this index. The approximate number of letters on one page of the *Geography* was a little more than 3000 letters. The letter or Roman numeral I has been used over 500 times on the page with the gazetteer of regions and larger islands. Proportionally, that is an enormous number and maybe too many to use font 115 R^a, or 115 R^b. The larger size of the letters on these pages might also have been a reason for the use of yet another font for these leaves. Veneziani mentioned typographical effects as a possible reason for using different fonts as well.⁸⁶ There is something else of interest to note regarding this font. Skelton described that the font 111 R^a was first found in a book dated October 22, 1482. This must concern the 1482 edition of the book *Regola della vita spirituale*, by Cherubino da Siena. However, the font is also present in Berlinghieri's *Geography*. The apologue, written by Ficino, on these first leaves printed with this font includes the appointment of the Duke of Urbino as general in the battle against Venice and the pope on April 17, 1482. Therefore, the font must have been applied after this date. Federico d'Urbino died on September 10, 1482, which is not mentioned in the printed version of the *Geography*. From this can be deduced that these pages very probably were printed before this date. That means that the font had already been used before October 22, 1482. The 1483 edition of the book *Regola della vita spirituale* was published July 31, 1483, about a month after the book *Horae Beatae Mariae Virginis ad usum Ecclesiae Romanae*, from July 5, 1483. This suggests that the 1483 edition of the book *Regola della vita spirituale* was printed in one month. If the same production time applies to the 1482 edition, it is quite possible that Tedescho could already dispose of font 111 R^a as early as the beginning of September 1482. It is unlikely that the font was available much earlier because according to Skelton it was used for the first time in the 1482 edition of the book *Regola della vita spirituale*. That would imply that these first pages of Berlinghieri's *Geography* must have been printed shortly before Urbino's death.

The gazetteers

Next, the printing order of the gazetteers needs to be clarified. The regular text of the second half of Liber Secundus and the entire Liber Tertius was printed with font 115 R^b. The fractions needed to print the coordinates in the gazetteer were already available. Therefore, the regular text and the gazetteer of these Libers could have been typeset on the same page. But that was only applied in Liber Tertius. On the last regular text page of this Liber a few lines of its gazetteer are printed as well. They were typeset together with the regular text and printed in one print run. That can be concluded from the layout of this page. It was the same in all the atlases studied and no differences concerning the density of the ink, which would indicate two print runs, were found on this page. Additionally, a correct application of the headers in the gazetteers of both Libers would be logical when they had been printed consecutively to the regular text. Again, that was not the case. To conclude, we have already described the alternating use of two headers on the recto and verso side of each leaf. Therefore, a correct continuation of the alternating presence of headers had to be expected at the transition from the regular text to the gazetteer of these

⁸⁴ Tedescho had just printed the gazetteer of Liber Septimus with font 115 R^b.

⁸⁵ Op. cit. (n. 83).

⁸⁶ Veneziani, op. cit. (n. 1), pp. 200-01.

two Libers. Instead, they were applied in reverse order in the gazetteer compared with the regular text in Liber Tertius, which indicates an interruption of the printing process.

The occurrence of *SECVNDVS* in the header of the gazetteer of Liber Tertius is explainable when the gazetteers of Liber Secundus and Tertius were printed one after the other. The gazetteers all look the same and the first few lines of the gazetteer of Liber Tertius were already printed together with text on the last regular text page of this Liber. Therefore, it must have been difficult to determine where the gazetteer of Liber Secundus stopped and where that of Liber Tertius began. It was obviously discovered too late, with the result that the first pages of the gazetteer of Liber Tertius were printed with the header belonging to Liber Secundus. This printing sequence also explains the minor break or interruption, detected by a change in the order in which the headers were applied, mentioned in the previous paragraph. These are the reasons why we have concluded that the gazetteers of Liber Secundus and Tertius were printed one after the other and after the printing of the regular text of these Libers. According to us, Berlinghieri did not apply headers above the gazetteers in his manuscript. We will substantiate it in more detail in chapter eight on the manuscripts. This is an additional justification for the incorrectly applied headers in Liber Tertius, Quartus, Sextus and Septimus. Furthermore, Veneziani described that Tedescho started printing the *Geography* with Liber Quartus because the first three libers were with the copyists.⁸⁷ This implies that in the exchange the last four libers went to the copyists and the first three to Tedescho. The consequence was that Tedescho could only print the gazetteers from Liber Quartus to Sextus after they became available again from the copyists. To conclude, it is plausible that Tedescho decided to finish printing the regular text first before switching to the gazetteers of Liber Secundus up to Sextus due to the specific character of its layout and typesetting.

Next, the gazetteers of Liber Quartus, Quintus, and Sextus were printed. Given the above, this is a logical continuation. It is confirmed by the already described use of paper based on the watermarks. But there are more indications for this sequence. They concern the last regular text page of Liber Quartus. Regular text and the gazetteer are found together on this page as in Liber Tertius. But there is a difference. In Liber Tertius the last lines of regular text and the first lines of its gazetteer were typeset together and printed in one print run. In contrast, in Liber Quartus they were typeset separately and printed in two print runs. It is the only page in the *Geography* that has been printed twice. First, only a few lines of regular text were printed at the top of the first column on the left side of this page. The gazetteer and the toponyms with their coordinates on the rest of the page were printed in the second print run. This is proven by the observation that the layout of the page is not constant. The orientation and vertical position of the blocks of regular text and gazetteer relative to each other vary in the different copies studied (Fig. 476-77). The regularly found differences in the density of the ink of the regular text and that of the gazetteer on this page constitute further evidence. Based on the watermark present in this specific leaf the regular text was printed first. That explains why the first leaf of the gazetteer of Liber Quartus is listed twice in the two columns at the right of table two b. It also indicates that the font for the fractions needed to print the coordinates of the toponyms in the gazetteer was not yet available. Otherwise, this page would have been printed in one print run as applied in Liber Tertius. The second print run of this page and subsequently the rest of the gazetteer of Liber Quartus must therefore have taken place at a later moment, according to us subsequent to the printing of the gazetteer of Liber Tertius and followed by the gazetteers of Liber Quintus and Sextus. On the verso of the first leaf of the gazetteer in Liber Quartus, *SEXTVS* was found in the header instead of *QVARTVS*, in all copies studied (table one). In only a few copies *SEXTVS* was also present on the recto of this leaf but in most copies *QVARTVS* was applied. On the verso of the second leaf *SEXTVS* was found again. This time in about half of the copies, whereas in the other half *QVARTVS* was present. In summary, we have found three different variants of copies of the *Geography* regarding these pages. *SEXTVS* can be found one, two, or three times in the gazetteer of Liber Quartus in the different copies. It is very unlikely that this would have happened if the gazetteer of Liber Quartus had been printed immediately after the regular text. Like the errors concerning the headers in the gazetteer of Liber Tertius, it is more explicable when the gazetteers were printed together and consecutively. We pondered upon an explanation for this feature. In the end, we may have solved the problem by examining the applied way of working. This was more often the key to the solution in the

⁸⁷ Ibid, p. 202.

Geography. According to us, the verso side of this first leaf of the gazetteer of Liber Quartus was printed first. For some reason, the number SEXTVS ended up in the header on the verso instead of QVARTVS. Perhaps the block of letters that form the number SEXTVS was wrongly placed in the letterbox. That would explain the consistent presence of SEXTVS in the header on this page of all copies studied. The next day the recto side with already a few lines of regular text was printed for the second time. We suppose Tedesco printed the verso side first to create a reference. In this manner it may have been easier to position the leaf of paper better during the second print run in order to match the text of the gazetteer to the already printed regular text, which contained, amongst others, the specification L IIII.⁸⁸ Obviously, the mistake was discovered early on, as in most copies SEXTVS was replaced by QVARTVS on this page. We already described that the letter blocks for the headers were applied alternately as automatism. That would explain why on the recto and the verso of the second leaf of this gazetteer QVARTVS and respectively SEXTVS were found again. It is a logical consequence of the continuation of the method of working. This time, the mistake regarding SEXTVS was discovered somewhat later as it was present in about half of the copies studied.

The transition from the regular text to the gazetteers in Liber Quintus and Sextus may be another indication that the gazetteers from Liber Secundus up to and including Sextus were printed consecutively. In these Libers, the gazetteers are printed on a new leaf of paper instead of together with the last lines of regular text on the already printed previous page. Obviously, Tedesco preferred this above a second print run. As a result, the layout of the last regular text page of Liber Quintus is a bit peculiar. The header LIBER is present above the first column with regular text on the left side of the page (Fig. 351). On the right side of the page the gazetteer with the header QVINTVS should have been printed. But the gazetteer was printed on a new leaf. As consequence, the header Quintus is missing on the right of this page which looks a bit awkward. The gazetteer of Liber Septimus forms the exception. Based on the watermarks it must have been printed consecutively to its regular text.

The fly, inter-, and end leaves

As already mentioned, not one single copy studied was completely in original condition. All copies were re-bound. Mostly, fly leaves from a later period were found. This could be deduced from the watermarks present in these leaves. However, two copies contain original fly leaves. They were found in front of the leaf with the title printed in black on the verso. The first one was present in a copy in Rome.⁸⁹ This copy contained three fly leaves. No watermark was present in the first one, but the paper structure seemed identical to the other paper used for the *Geography*. The next two leaves contain a shearer

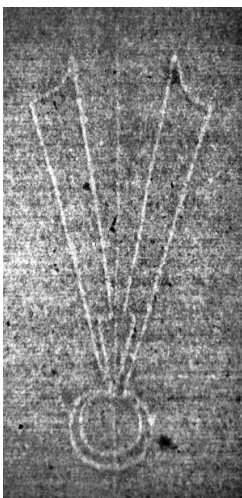


Fig. 478



Fig. 479

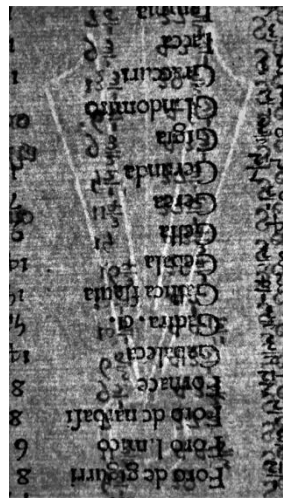


Fig. 480

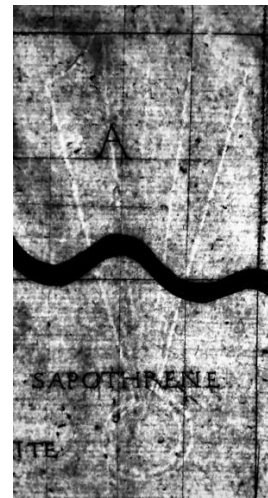


Fig. 481

⁸⁸ Also the Ripoli print shop had great difficulty printing the paper with a correct page layout. Some pages were as much as 8 mm out of line. He asked a blacksmith to make triangular pins for the tympanum with which the paper could be pinned so that it could no longer shift: King, op. cit. (n. 15), pp. 353-54, Conway, op. cit. (n. 75), p. 182; Other printers apparently faced similar problems.

⁸⁹ Biblioteca Nazionale Centrale di Roma, shelfmark 70.1.G.5.

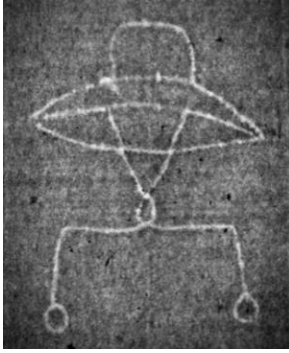


Fig. 482



Fig. 483



Fig. 484

scissors watermark. They were very similar, but not identical (Fig. 478-79). This same type of shearer scissors watermark was found in some other copies in the leaves 32 and 33 of the gazetteer of Liber Secundus, described in the paragraph about the spare paper (Fig. 480). Noteworthy, the identical type of shearer scissors watermark was detected in some of the first printed maps (Fig. 481). The only other copy, with an original fly leaf in front of the leaf with the title printed in black, was studied in the Vatican City.⁹⁰ This fly leaf contains a variant of the cardinal's hat watermark, type 6 (Fig. 482). In addition, two variants of this type of watermark were found in two interleaves present in this copy (Fig. 483-84). In the paper of the four modern maps four more variants of this watermark cardinal's hat, type 6, were detected (Fig. 485-88). We consider the fly leaves in these two copies as belonging to the original first binding. The fact that identical or nearly identical variants of the watermarks found in the fly leaves were also present in other parts of the *Geography* are a strong indication that these leaves must have been added in Tedesco's printing office. Possibly, the different copies were already compiled in his office after the maps were printed. This seems to be confirmed by the watermarks found in the interleaves present in the different atlases. A very specific example is the find of a crowned eagle watermark in an interleaf



Fig. 485



Fig. 486



Fig. 487



Fig. 488



Fig. 489

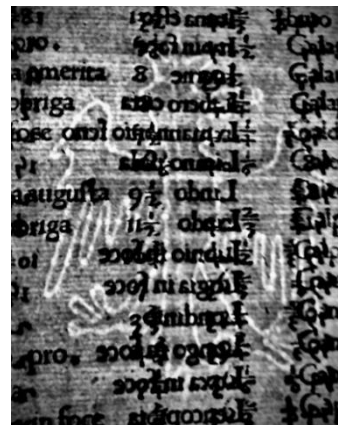


Fig. 490

⁹⁰ Biblioteca Apostolica Vaticana, shelfmark BAV Stamp.Ferr.S.37.

in a copy in Brussels (Fig. 489).⁹¹ A twin mould variant was detected in two copies only in the gazetteer of Liber Secundus (Fig. 490).

An overview of the interleaves present in the atlases studied is shown in table three together with the watermarks detected in these leaves of paper. Only a limited number of interleaves with watermarks was found. Those without a watermark had an identical paper texture (Fig. 491-92). We decided to

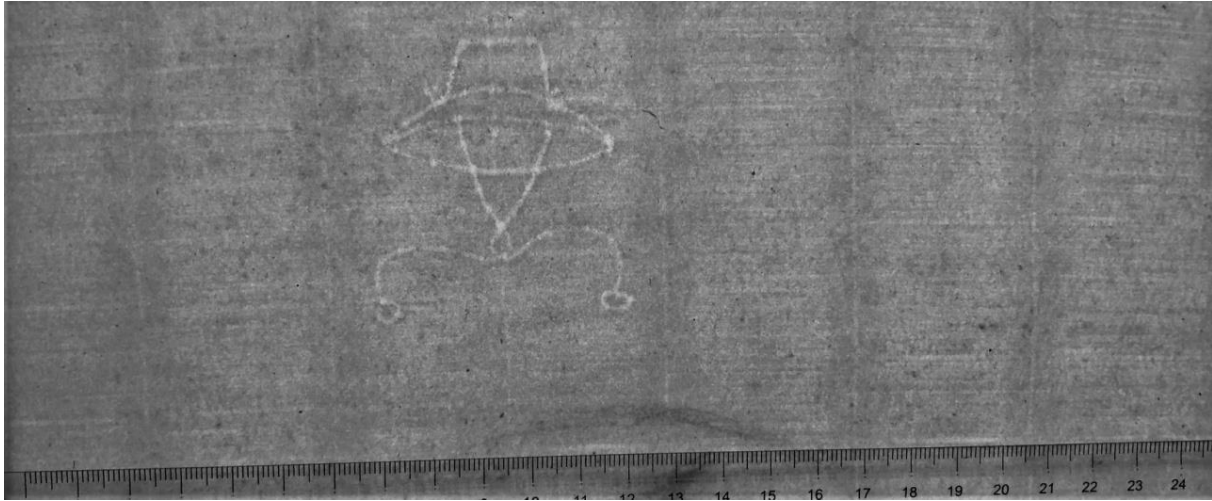


Fig. 491

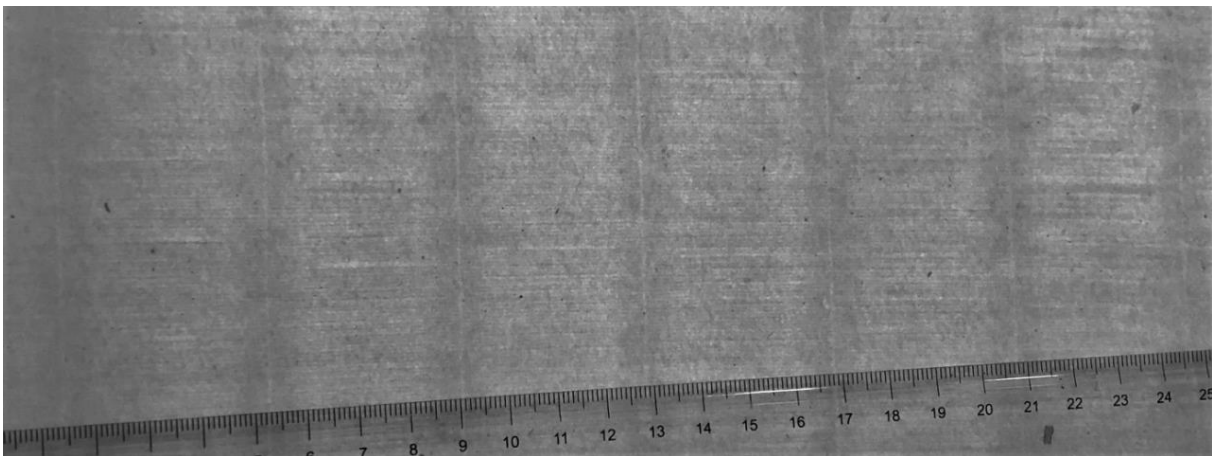


Fig. 492

present the type of watermark in this table more exactly to provide as much information as possible. In table three the atlases are presented from top to bottom in a chronological order as applied in table one and two from left to right. The atlases mostly contain four interleaves. They were found subsequent to the gazetteers of Liber Secundus, Tertius, Sextus, and Septimus and are displayed in brown from left to right. The paper of these interleaves contains the same watermarks as present in other parts of the *Geography*. Therefore, we concluded that these interleaves must have been added or provided by Tedescho. The exclusive presence of the very specific watermark cardinal's hat type 6 in the interleaf following Liber Secundus as well as Liber Sextus in the copy in the Vatican City described above is a further confirmation. The interleaves in the second edition copies displayed in different shades of grey contain the same watermarks as the earliest printed atlases presented in blue and green. The table further shows that interleaves were lacking more often in the second edition copies issued by Giunti. Therefore, we may conclude that the interleaves of the Giunti copies must also have been added or provided by Tedescho. Obviously, Giunti took over the remaining sets of text and maps, as well as the copper plates to print maps. Probably, everything was still in possession of the Berlinghieri family as the transfer must have taken place early in the sixteenth century. The largest number of maps were printed by Giunti, as will be clarified in chapter six on the maps. The interleaves may not have been added to each and every

⁹¹ De Koninklijke Bibliotheek van België, shelfmark Inc C 208.

copy yet, as the maps of most copies still had to be printed. That would explain the less consistent presence of interleaves in these second edition copies. Another - in our opinion less probable - explanation might be that these leaves were removed, or not added by the bookbinders in the sixteenth century. However, in that case you would expect them to be missing in all copies. We can be brief about end leaves as they were not found in any copy.

Position and function of the interleaves

In the previous paragraph we described the position of interleaves as directly following the gazetteer of Liber Secundus, Tertius, Sextus, and Septimus, in other words directly in front of the maps following these gazetteers. However, according to us there is no connection whatsoever between the presence of the interleaves, including their position in the *Geography*, and the maps. If that had been the case, interleaves should also have to have been found prior to the maps belonging to Liber Quartus and Quintus. Pursuing this theory, interleaves had to be placed following the maps of each Liber as well. That appeared not to be the case. Our theory is that the presence and position of the interleaves might have a functional reason and that they were related to the composition of the book. Interleaves were also found in other books printed by Tedescho, like *La Divina Commedia*, *Disputationes Camaldulenses*, and *Moralia in Job*. These were textbooks, although the *Commedia* contains some images integrated into the text. In these books the interleaves add nothing to the presentation and appearance. Therefore, we assume that the interleaves in all these books, as well as in the *Geography*, were added to fill or complete the quires for the bookbinder. This implies that they were added during collation.

A final find regarding the interleaves was the presence of additional interleaves prior to the maps *TABVLA OCTAVA* and *NONA D ASIA* in a few copies only. They are shown in the colour orange in table three at the right. These two maps are the only single page maps found in the *Geography*. A general feature of the copies with these additional interleaves was that they contain the earliest printed maps and were the most lavishly illuminated and coloured atlases. Therefore, these specific interleaves must have been added for presentation purposes. In addition, the watermarks detected in them were regularly found in the paper with which the maps of these copies were backed.⁹² From this can be deduced that these leaves of paper were inserted in the workshop that backed, coloured, and illuminated these copies.⁹³

Print schedule

The German printer Mentelin managed to print 300 leaves, thus 600 pages, in one day in 1458.⁹⁴ This explains the print runs of 275-300 copies of many books in those days. Pollack described that around 1486 a typesetter could compose four columns of folio, thus two pages in one day.⁹⁵ He further calculated 6,75 hours for printing a proof page, reading and correcting the page, cleaning the letters after printing, and putting them back in the right place in the letter box. The typesetter selected the letters from boxes in a letter cabinet based on a sheet of copy that was placed on top of it. Because the metal letters were visible in mirror image, letters such as b and d and p and q could easily be confused. In addition, there was a risk that a certain printing letter would end up in the wrong box after use or that the letters u and n would be mixed up. The line endings had to be filled out using hyphenation and careful spacing with filler white or blank characters between the words. The typesetter's work was made even more complicated by the fact that the words and sentences had to be placed upside down in the typesetting hook. Next, the typesetter pushed the set in a galley until he had set a complete page.⁹⁶ In smaller printing offices, where the typesetter and the printer could be the same person, one page in folio format could be typeset and printed each day in a print run of about 500 copies during a working day of 14 hours.⁹⁷ The

⁹² These watermarks can be found in chapter four on the paper and watermarks where all the watermarks are presented.

⁹³ In some copies these interleaves were wrongly inserted during later rebinding.

⁹⁴ Michael Pollack, 'Production costs in fifteenth-century printing', *The Library Quarterly*, 39 (1969), pp. 324-25.

⁹⁵ Pollack, op. cit. (n. 94), p. 321.

⁹⁶ King, op. cit. (n. 15), pp. 334-37.

⁹⁷ Op. cit. (n. 94), pp. 324-25.

letters were inked with a pair of ink balls (leather-covered pads filled with wool and mounted on wooden handles). They were rubbed against each other to distribute the ink well and then placed against the mould with rocking movements so that the surface of all the letters was evenly covered with ink. This had to be done with care to not knock out any printing letters from the galley. If that did happen, they had to be replaced carefully.⁹⁸ One leaf of paper was printed per side on each day. Then it had to dry. The other side could be printed the next day.⁹⁹ The ink-stained parts of the galley with letters had to be thoroughly cleaned and the letters had to be carefully, which was not always the case, placed back in their compartments ready to be reused.¹⁰⁰ Pollack further mentions 5000 to 5500 characters on a page in a book.¹⁰¹ We counted the characters on a few pages in Berlinghieri's *Geography*. This resulted in an average of about 3000 letters per page in folio format. For the printing of Ficino's edition of *Plato's opera*, the typesetters had to place over 3000 letters, more than a third more than for the *Decamerone*, per page. Two years earlier, Lorenzo di Alopa had printed at most one page per day of Boccaccio's text, a pace that in the summer heat of Florence at the time had clearly taken a physical and possibly mental toll on him.¹⁰² Pollack's statements are in accordance with the findings of Melissa Conway in her thesis about the *Diario* of the printing press of San Jacopo di Ripoli.¹⁰³ She also points out that one could typeset about two pages of a book in a smaller format and print up to 600 pages each day. This is comparable with one page in folio format. A fourteen-hour workday during six days a week was usual. She further cites an article describing that one page in folio format could be typeset each day.¹⁰⁴

Conway expanded her research to other printers active in Florence at the time and provided a list of the books published in Florence by different printing offices between 1476 and 1484. It shows that the printing office of San Jacopo di Ripoli produced more books than Tedescho's. This is confirmed by the output of printing offices in Florence in those days found in the Gesamtkatalog Wiegendrucke. She also described an agreement between Tedescho and Domenico, the printer of the Ripoli convent, to use each other's printing press in November 1480. The objective of this agreement probably was operational reliability and more assurance for customers. Nevertheless, the agreement already ended two weeks later. Conway further found that Domenico got a second printing press to print the *Decamerone* by the end of 1482.¹⁰⁵ From this information may be concluded that both printing offices had only one printing press for relief printing up to the end of 1482. This was not the only venture between Tedescho and Domenico found in her thesis. Domenico entered a partnership with Tedescho's son Giovanni for about two and a half months on May 15, 1477. During this partnership, based on labor rather than capital, Domenico purchased a Roman font for ten large florins from Giovanni. It was used to jointly print 300 copies of the *Libro da compagnia*. The printing of 2000 unspecified *orazioni* was also included in the work of the partnership.¹⁰⁶

From the literature can be concluded that Tedescho must have been able to typeset and print one page in folio format per day in a print run of 300 to 500 copies. For the *Geography* only 3000 letters per page have been used instead of around 5000, as in an example from the literature.¹⁰⁷ Therefore, a print run of about 500 copies, more or less the number of sheets in a ream of paper, must have been possible. For a smaller sized book, a print run of about 300 was common to be profitable. For Berlinghieri's *Geography* in folio format, including thirty-one copper engraved maps, a larger print run must have been necessary to meet costs. Thus, a print run of about 500 copies is more likely. It was not possible to print the recto and verso of a leaf on the same day since the ink on the printed side had to dry first. The consistent and alternating presence of a specific header on the recto of each leaf and a second variant on the verso of each leaf as found throughout the *Geography* confirms this way of working. Printing the

⁹⁸ King, op. cit. (n. 15), pp. 334-37.

⁹⁹ Op. cit. (n. 94), pp. 323-26.

¹⁰⁰ King, op. cit. (n. 15), pp. 334-37.

¹⁰¹ Op. cit. (n. 94), p. 321.

¹⁰² King, op. cit. (n. 15), p. 415.

¹⁰³ Op. cit. (n. 75).

¹⁰⁴ Ibid, they managed to typeset and print about one and a half to two pages of a book in a smaller format. The typesetting of a page for the book *Morgante Maggiore*, a book in folio format, took a complete day, note on p. 53.

¹⁰⁵ Ibid, p. 60.

¹⁰⁶ Ibid, pp. 35-6.

¹⁰⁷ Op. cit. (n. 94), p. 321.

recto of the first leaf had to be combined with printing the verso the next day, and so on. Therefore, we strongly believe that, on average, each day one page of text or gazetteer was set in type and one page was printed.¹⁰⁸ Implicitly, this means that there were 6000 letters in use every day, 3000 from the page printed the previous day and 3000 for the page to be printed that day. In case the used letters had not been cleaned in time, Tedesco would have needed even more type. Probably, this was not available in sufficient amounts, which might be the reason that different fonts were applied in combination on some pages.

Additionally, we found a few more details in the *Geography* itself that indicate that one page per day was typeset and printed. The first one concerns the toponym Thyle with its coordinates on two lines in the last column on the recto of the first leaf of the gazetteer of Liber Secundus. In some copies the toponym Thyle was not present. In these copies the last two toponyms on this page are Tuesi and Tuesiesto (Fig. 403-05). Strangely enough the first two toponyms on the recto of this specific leaf are again Tuesi and Tuesiesto, but now in reverse order. This was observed in all copies studied. In most copies, Thyle was inserted on the recto of this leaf. It is obvious that the first two toponyms on the verso of these copies had to be Tuesi and Tuesiesto, although they were present in the wrong alphabetical order. If multiple printing presses had been in use at the same time or if several pages had been typeset on the same day, we should have found leaves without these two toponyms on the verso side. Such a layout would match with the copies without Thyle on the recto. The only other possible explanation would be that these leaves were discarded. This is very unlikely because the *Geography* is full of pages with inconsistencies that have not been disposed of. It seems that this adjustment took place quite early during printing because we only found a few copies without the presence of Thyle. This is an indication of a form of editing during printing. The same applies to the correction in some copies of the word SECVNDVS into TERTIVS in the header on the recto of leaf 65. We also found indications of editing on the maps. They will be described in chapter six on the maps. Another feature concerns the already described errors in the headers of Liber Quartus where SEXTVS was found regularly instead of QVARTVS. Again, a form of editing must have had taken place during the day. These mistakes and their corrections can almost impossibly take place when multiple printing presses had been in use or when several pages were typeset together on one day. We found an additional confirmation of on-site editing in a copy in Venice.¹⁰⁹ The

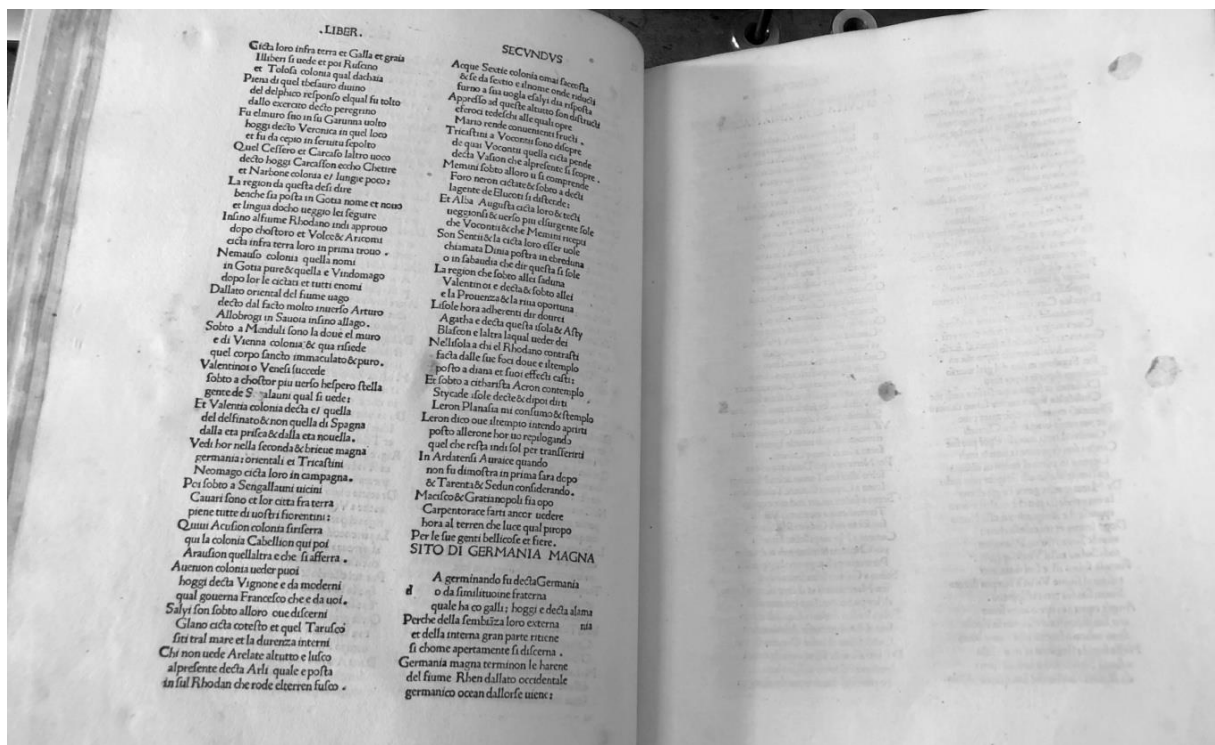


Fig. 493

¹⁰⁸ Woodward, op. cit. (n. 49), pp. 214-15.

¹⁰⁹ Biblioteca Nazionale Marciana, shelfmark Inc. 0037.

recto side of a text page in Liber Secundus of this copy was blank (Fig. 493). On the verso side, the text was consistent with all other atlases. In case multiple printing presses had been in use, or when several pages were typeset together on one day, the mistake could have been corrected. This is not the case. The galley must already have been depleted of letters what applies to printing one page per day. Therefore, that page could not have been printed anymore the next day without typesetting the whole page once again first. This was probably not done because it was far too laborious and costly.

Mostly, given their nature, the corrections can be attributed to Tedesco. Moreover, it cannot be assumed that Berlinghieri inspected the printing of his *Geography* daily. A find that supports this theory is the use of 59 lines on the third and second to last pages of the gazetteer of Liber Quintus, much more than usual in the gazetteers. On these two pages the headers were absent. We believe that this is not a coincidence but that it was applied deliberately by Tedesco. It was his solution to avoid the use of an extra leaf of paper to print this gazetteer. Additionally, it indicates that the pages are typeset one by one. Otherwise, this problem would have been solved in a different manner. It confirms once more that there was no question of the presence and use of multiple printing presses nor the typesetting of several pages per day. In that case, these differences in the number of lines per page would not have occurred. It also shows that Tedesco was thinking and planning as far as possible. Other modifications, as for example the insertion of the toponym Thyle and corrections on the maps, might be ascribed to Berlinghieri. The text in the colophon mentions the utmost care by the author in adjusting and editing the text, which might indicate that Berlinghieri was involved in the editing. It may also be interpreted as an attempt of Tedesco to cover his shortcomings and adaptations during printing.

In all, the information from the literature that in those days one page could be typeset and printed in folio format and that only one printing press was available for relief printing in Tedesco's office seems to be confirmed by some specific findings in the *Geography* itself. There is another finding against the simultaneous use of two relief printing presses. Tedesco did not have enough type to fill the galleys, necessary to operate two printing presses. We have already described that he probably was already short of letters when printing the gazetteers. The use of more than one printing press would have enlarged that problem. On top of that, Tedesco would have needed more employees to operate these presses. There is no indication, nor evidence for this. Ridolfi described the financial difficulties Tedesco experienced to keep his business afloat.¹¹⁰ With more printing presses and more staff, that would have been even more difficult. The many flaws relating to his printed matter do not indicate the presence of a large and experienced staff. Above all, we know from the diary about the Ripoli printing office, which had a larger output, that it had only one printing press for relief printing up to 1483 in combination with a very small staff.¹¹¹ From all this may be inferred that only one printing press must have been in use. And, it cannot be repeated often enough, this was confirmed by our findings concerning the headers. More different types of headers would have been found in case two printing presses were operating at the same time.

Berlinghieri's *Geography* counts 123 printed leaves, of which two are only printed single-sided. The first page of the gazetteer of Liber Quartus has gone through the printing press twice. Thus, the printing of the *Geography*, except for the maps, would have taken about 245 working days according to the schedule above. With six working days a week, that would be forty-one weeks, or about nine months, without interruption. In chapter four on the text and the watermarks, the period in which the *Geography* was printed is explained. Now we know the time it took to print the text. In the chapters six and eight on the maps and the manuscripts, we will combine these data with those about the maps and interpret them further.

The register and colophon

The page with the table of contents, the register and colophon, must have been printed last. In many copies, it was printed on the last leaf, sig. f 10v.¹¹² It was predominantly found in second edition copies of Berlinghieri's *Geography* from the sixteenth century, characterized by the title printed in red

¹¹⁰ Roberto Ridolfi, 'Le ultime imprese tipografiche di Niccolò Tedesco', *La Bibliofilia*, 68 (1966), pp. 145-48.

¹¹¹ Op. cit. (n. 75), pp. 33, 39-40.

¹¹² Skelton, op. cit. (n. 1), p. VII.

on the recto of the leaf with the title printed in black on the verso. However, three exceptions in first edition copies were found. Firstly, the leaf with the register and colophon present in a copy in Rome was added in manuscript.¹¹³ Secondly, in a copy in London an original leaf with the register and colophon was present.¹¹⁴ Several notes on the inside of the cover tell us that this leaf was missing, just as the leaf with the title and several maps. Nowadays, this copy is complete again. A facsimile leaf with a title printed in red was added to this copy, as well as several maps printed by Giunti, and an obviously original leaf with the register from another copy. The third and last exception concerns a copy in the Vatican City.¹¹⁵ This copy was also restored. It contains maps from different copies and an original leaf with the register and colophon. However, the size of this leaf was clearly smaller compared to the other leaves present in this copy. Therefore, it is more than probable that this leaf was also added to this copy at some point. Thus, we found no first edition copies with an original leaf with the register and colophon belonging to the copy.

The question remains when this page has been printed, as the date of printing was not added. The composition of the *Geography* is quite specific and different from the various editions of the *Cosmography*. The bookbinder must have received specific instructions on how to compile Berlinghieri's *Geography*. He might have benefited from a page with a register. Perhaps it was available without being bound in. Or the bookbinder was informed in some other way about how to compose the *Geography*.¹¹⁶ Skelton hypothesized that the absence of the register and colophon in some copies implies that the text on sig. f 10v was printed last. The font used to print this page was different from the three fonts applied to the other pages of Berlinghieri's *Geography*.¹¹⁷ There has been some discussion about this font. Veneziani and BMC, consulted by Skelton, considered the font used for this page to be the same as one of the fonts applied for the title in red.¹¹⁸ This would mean that the page with the register and colophon was printed in the sixteenth century. That would explain its presence in copies with the title printed in red. Almagià observed that usually a leaf with the register and colophon is added to copies with a title printed in red on the recto side of the first leaf.¹¹⁹ Skelton himself assumed that the page with the register and colophon was printed not long after the rest of the text and after a number of copies had already left the printing office.¹²⁰ This would explain the existence of three variants of Berlinghieri's *Geography*, one variant with the title printed in black, a second variant with the addition of the page with the register and colophon, and a third variant with the further addition of the title printed in red. Skelton suggested that the last of the four interleaves of the *Geography* was used to print the register and colophon at a later stage. Only part of the edition was still present in the printer's office at the time the register and colophon were printed, which would explain its presence in some copies with the title printed in black.¹²¹ This is in contradiction with BMC's view that the font dates from the sixteenth century.¹²² Therefore, Skelton consulted George Painter with regard to the font used to print this page. Painter identified it as a variant of the two fonts, 115 R^a and 115 R^b, applied for most of the text in Berlinghieri's *Geography*.¹²³ That would support Skelton's opinion.

We studied the watermarks present in the paper on which the register is printed. In all leaves printed with the register and colophon, no watermark or the watermark cardinal's hat type 4 in several variants was present (Fig. 494-95). They match with those found in the paper used for the frontispiece and the two preliminary leaves of the *Geography*. It indicates that the leaf with the register and colophon must have been printed consecutively. In only one atlas a somewhat rarely variant of the watermark

¹¹³ Biblioteca Casanatense Roma, shelfmark Vol.Inc.1110.

¹¹⁴ National Maritime Museum, shelfmark PBD 7690.

¹¹⁵ Biblioteca Apostolica Vaticana, shelfmark Inc.S.120.

¹¹⁶ A few centuries later, Clement de Jonghe demanded the delivery of a bound book as an example when acquiring the copper plates so that he could reissue that book in the proper format; Frans Laurentius, *Clement de Jonghe (ca. 1624-1677) Kunstverkooper in de Gouden Eeuw* (Houten 2010), pp. 46-7.

¹¹⁷ Skelton, op. cit. (n. 1), p. VII.

¹¹⁸ Skelton, op. cit. (n. 1), p. IX; Veneziani, op. cit. (n. 1), p. 206.

¹¹⁹ Op. cit. (n. 34), p. 216.

¹²⁰ Skelton, op. cit. (n. 1), p. VII.

¹²¹ Ibid, pp. IX, X.

¹²² Op. cit. (n. 16). As cited in Skelton, op. cit. (n. 1), p. IX.

¹²³ Op. cit. (n. 23). As cited in Skelton, op. cit. (n. 1), pp. IX, XIII.

cardinal's hat type 3d was found (Fig. 496).¹²⁴ We consider the presence of the special variant of the watermark cardinal's hat type 3d in one copy only as an example of the use of a leaf of spare paper, as there were found and described more. Thus, an extra confirmation that the leaf with the register and colophon was and must have been printed together with and directly following the rest of the text pages and gazetteers of the *Geography*. An additional argument for this is that in none of the leaves with the register and colophon a watermark was found that was present in the paper applied for the maps.¹²⁵

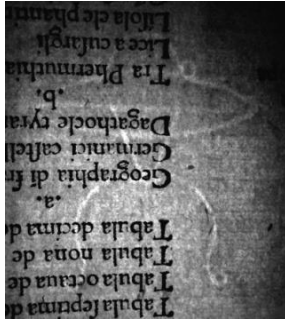


Fig. 494

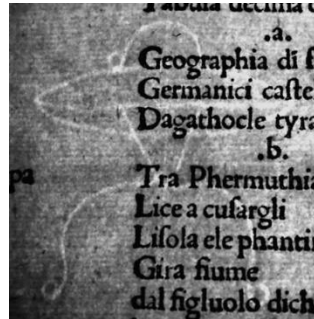


Fig. 495

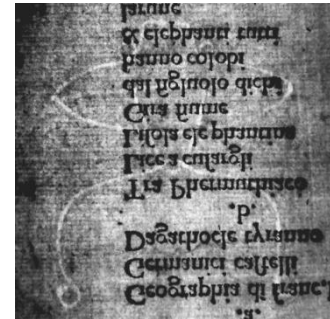


Fig. 496

We consider Skelton's explanation less plausible for several reasons. We did not find a single first edition copy which contained a page with the register and colophon that appeared to have been part from the beginning. Furthermore, it is not logic to restart printing text pages after the project had already finished. Printing the register and colophon on the last interleaf by removing it from each already compiled copy is a very unlikely procedure. The interleaves were probably not added until the book was assembled, ready to be illuminated and bound. They had a function in the composition. It is therefore very improbable that they were taken out to be printed and re-inserted after printing. Such a way of working was very laborious and illogical. Further, the leaf of paper had already been trimmed. Therefore, it must have been difficult to print the register and colophon in a way that the leaf subsequently could be added neatly to the rest of the book. When the leaf with the register and colophon would have been added later, it would almost certainly have been printed on a new stock of paper with a significant chance of finding other watermarks. That was not the case. The theory that the page with the register and colophon was not printed until the sixteenth century by Giunti is even more improbable. It is very unlikely that the watermarks found in the leaf with the register and colophon would have been present in paper printed about forty years later.

Then the question arises why this specific leaf is found in second edition copies and not in those belonging to the first edition. Even though it was already available. We found an inconsistency on this page.¹²⁶ However, since many pages with anomalies were detected in the *Geography* and these leaves were not discarded, we assume that this was probably not the reason not to include the leaf with the register and colophon. Our explanation, even though we cannot prove it, is as follows. The register contains three columns of text. The colophon is as follows: *Impresso in Firenze per Nicolo Todescho & emendato con somma diligentia dallo auctore*. The translation of this is as follows; printed in Florence by Nicolo Tedescho and reviewed/revised and adjusted with the utmost care by the author.¹²⁷ Most of the books printed by Tedescho and studied by us contain a colophon. But none had this addition regarding the author and his endeavors. It is known that Berlinghieri was closely involved in the illumination and distribution of the first copies. We, as well as other scholars, already described the many irregularities and inconsistencies present in Berlinghieri's *Geography*. Berlinghieri himself apologizes for this in his letters to Cem and Bayezid, the sons of Sultan Mehmed II, who both received richly illuminated copies.¹²⁸

¹²⁴ Biblioteca Nazionale Universitaria di Torino, shelfmark XV.I.41.

¹²⁵ See the watermarks in the maps presented in chapter four on the paper and the watermarks.

¹²⁶ A difference has been discovered between the order of the maps according to the liber indication printed on the map and the order shown on the page with the register and colophon. The liber indication positions the maps *HISPANIA* and *GALLIA NOVELLA* consecutive to the maps *TABVLA SECVNDA DE* and *TERTIA D EVROPA*. In contrast, on the page with the register and colophon both *NOVELLA* maps are positioned in between the regular maps.

¹²⁷ Op. cit. (n. 34), p. 216.

¹²⁸ Ibid, p. 217; Roberts, op. cit. (n. 35), *Printing a Mediterranean world: Florence, Constantinople, and the renaissance of Geography*, p. 83; Op. cit. (n. 39), p. 44.

Obviously, Berlinghieri was aware of these deficiencies and imperfections. He would have ridiculed himself if he would have added the leaf with the register and colophon with the text stating the "utmost care by the author". His personal involvement with the composition, illumination, and colouring was also found in relation to a copy found in Rome.¹²⁹ Therefore, we conclude that Berlinghieri himself had decided not to include the leaf with the register and colophon in the *Geography*. Giunti, the publisher of the second edition, would have benefited from the insertion of this leaf into his release. It would make clear that Giunti could not be held responsible for the "sloppy" execution of the *Geography*. A final clue in this matter may be that *Plato's Opera* by Marsilio Ficino was printed in the printing office of the Ripoli convent not long after the *Geography*.¹³⁰ The diary of this convent contains comprehensive and detailed notes about the visits Berlinghieri made to this printing office, together with Filippo Valori, to arrange the printing and the payment of this book.¹³¹ That would not have been obvious in case Berlinghieri had been satisfied with Tedescho's performance.

Our conclusion is that the page with the register and colophon was printed together with and immediately consecutively to the rest of the text pages and gazetteers but not inserted in the first edition copies of Berlinghieri's *Geography* printed in the fifteenth century. Furthermore, we believe it was inserted as a rule in the second edition copies with the title printed in red. The absence of the leaf with the register and colophon in some of these later copies can be explained by the fact that it was the last leaf printed of the *Geography*. With all copies being re-bound, the first and the last leaves of a book will have been the most susceptible to damage. This explains why the leaf with the register and colophon, as well as the leaf with the title are found missing in some of the second edition copies studied.

Concluding remarks

The collation described by Skelton is largely correct. However, we would like to make a few adjustments. The first edition atlases printed in the fifteenth century contain four blank interleaves instead of three and they did not contain the leaf with the register and colophon. In addition, some of the richest illuminated and coloured copies of the first edition contain two additional blank interleaves in front of the maps *TABVLA OCTAVA* and *NONA D ASIA*. The second edition atlases, characterized by the title printed in red, and maps printed in the sixteenth century can be found with zero to four blank interleaves. In addition, the leaf with the register and colophon should be present in the second edition atlases but may have been lost due to damage and rebinding.

The different aspects of the text pages and gazetteers described, show a certain degree of consistency regarding the production and composition of the *Geography*. On the other hand, within this consistency, many inconsistencies appeared. They are typical and characteristic for Tedescho's work. It took some time and a lot of thinking before we understood them. In a way, the irregularities detected do not undermine the findings. They rather confirm what already has been discovered. However, on first sight they might mislead you. Especially, when individual and specific inconsistencies are overemphasized, and the overview is lost. Therefore, we want to make clear that these alleged inconsistencies are in fact characteristic for Tedescho's way of working although it was sometimes difficult to discover and comprehend. This view has to be kept in mind for the next chapters. That will make it easier to understand the findings.

Another peculiar find we want to highlight once more concerns the interruption halfway the regular text of Liber Secundus. At exactly that point the font changed from 115 R^a to 115 R^b, the typography of the headers changed, as well as the watermarks present in the paper. Together with the first regular text page of Liber Quartus it is the only one without a header (Fig. 350, 467-68). As if Tedescho forgot to apply the header at the start of printing, as well as at the restart halfway this Liber. Although rarely, other types of watermarks occurred after the interruption halfway through Liber Secundus. These watermarks, e.g. the shearer scissors, were also found in the paper used to print the maps as we will show in the following chapters. The second half of the text pages was printed on a

¹²⁹ Raphaele Tauci, 'La geografia del Berlinghieri della Biblioteca Alessandrina di Roma', *La Bibliofilia*, 69, (1967), pp. 69-73; Biblioteca Universitaria Alessandrina, shelfmark Inc.541.

¹³⁰ Op. cit. (n. 64), pp. 27-8, 104-08, 112.

¹³¹ Ibid, pp. 104-08, 112; Op. cit. (n. 75), pp. 268-72, 276.

different stock of paper. Something important must have taken place that justifies the interruption of the printing of the text. The occurrence of a specific watermark found in the maps as well as in some text leaves printed after the interruption, suggests that a few maps were printed during the interruption. According to us, the important event was the arrival of the copper plates with the maps. We will elaborate on this in chapter six on the maps.

We believe that in this chapter we have explained and proven in which order Berlinghieri's *Geography* has been printed. The finding that Tedescho started printing the *Geography* with Liber Quartus appears strange but can be explained. Veneziani suggested that the first three Libers were not yet available when Tedescho started printing.¹³² He suspected that they were with the copyist of one of the two manuscripts. We concur with Veneziani. Subsequently, Liber Primus to Tertius were put at Tedescho's disposal, while Liber Quartus to Septimus were given to the copyists. It can also be deduced from this that Tedescho was only able to print the gazetteers of Liber Quartus to Sextus after these became available again from the copyists. It shows that the gazetteers of Liber Secundus to Sextus must have been printed after the regular text and in immediate succession of each other. We described many indications that support our theory in this chapter and will further elaborate on the subject in chapter eight on the manuscripts.

We would like to end this chapter with a preliminary refinement of the chronology of the *Geography*. Based on the watermarks, it was printed in between the books *La Divina Commedia* in 1481 and *Horae Beatae Mariae Virginis* in 1483. Federico d'Urbino was appointed as general in the battle against Venice on April 17, 1482. This appointment is mentioned in the *apologia* by Ficino in the *Geography*. In this chapter we learned that the font 111 R^a, used to print this information, was found for the first time in the book *Regola della vita spirituale* published October 22, 1482. Tedescho published another edition of the book *Regola della vita spirituale* on July 31, 1483, almost four weeks after the publication of the book *Horae Beatae Mariae Virginis* on July 5, 1483. If we apply the same production time in 1482, then the font 111 R^a may already have been available about the date of Federico's death on September 10, 1482. This indicates that the *Geography* might just have been completed before the start of the production of the book *Regola della vita spirituale* published October 22, 1482 and before Federico's death.

¹³² Veneziani, op. cit. (n. 1), p. 202.

CHAPTER 6

Berlinghieri's Geography: the printed maps

General introduction

In 1482, the printer Niccolò Tedescho finished the printing of the text and the maps for the *Geography* by Berlinghieri. In the previous chapter we described how the text pages were all printed consecutively, with an interruption halfway Liber Secundus. This could be deduced from the combined information of the separate features studied, such as the print characteristics, the flaws, the fonts, the headers, and the watermarks. Because the printing of copper plates requires a fundamentally different printing method, Tedescho must have had at least two printing presses in his workshop. One for the printing of type and one for the intaglio printing of the engraved copper plates. He had already gained experience with the relatively new medium of intaglio printing with the printing of the illustrations for the books *Monte Sante di Dio* in 1477 and *La Divina Commedia* in 1481.¹

Almagià described that all the maps were printed from the same copper plates and that they were never adapted or changed.² He concluded that they were printed all together, because the same watermarks were found in varying compositions in the different atlases.³ Heawood was of the opinion that the maps were printed at different times, based on the fact that certain watermarks in the paper of the maps clearly date from the sixteenth century.⁴ Roberts pointed out that the impressions of the maps were made on very thick and sturdy paper.⁵ Porticelli wrote that the two atlases present in Turin had a different title above the ninth map of Europe, although one title was printed and the other painted.⁶ In all, some findings conflicted while others raised questions. At the end of our research, we gained understanding of the problems other scholars encountered in studying Berlinghieri's *Geography*. Several of them studied only some elements in a limited number of atlases. Regularly, only a small number of copies was present in the immediate vicinity, which limited the scope of their research. Compared to the editions of the Rome *Cosmography*, the production of the *Geography* was quite different. Where the creation of the Rome *Cosmography* was a well thought out and structured process, that of the *Geography* appeared to be far more random. A confounding factor concerns the fact that all atlases studied have been re-bound and restored. This may have led to misinterpretations in the past. To rule that out, one needs to study as many aspects of as much atlases as possible and combine the findings. Only in this way it is possible to solve the puzzle. Eventually, the course, cause, and meaning of the apparent irregularities did become clear. In the end, they confirmed our concepts about the way the *Geography* was created. We have decided to underline the characteristics of the different types of maps found first, instead of interpreting the *Geography* in full, from the start. As soon as the course of events becomes clear, it is easier to study, interpret, and understand the individual atlases.

In this chapter we first discuss the copper plates, the engraving of them, as well as the paper and the printing. Subsequently, the discovered states of the maps will be described. The different types of maps are addressed next, followed by the chronology. We conclude by integrating all findings. The complete individual copies of the atlases studied will be described in a separate chapter. In order to better understand the remainder of this chapter, we would like to inform the reader at this point that three types of maps can be found in the *Geography*. The first two types of maps were printed together with the

¹ Antonio da Siena, *Monte santo di Dio* (Florence 1477); Dante Alighieri, *La Divina commedia* (Florence 1481).

² Roberto Almagià, 'Osservazioni sull'opera geografica di Francesco Berlinghieri', *Archivio della R. deputazione romana di storia patria*, 68 (1945), p. 251.

³ Almagià, op. cit. (n. 2), pp. 219-20.

⁴ Edward Heawood, 'The use of watermarks in dating old maps and documents', *The Geographical Journal*, 63 (1924), p. 396.

⁵ Sean Roberts, *Cartography between cultures: Francesco Berlinghieri's Geographia of 1482* (Michigan 2006), p. 121; Sean Roberts, *Printing a Mediterranean world: Florence, Constantinople, and the renaissance of Geography* (London 2013), p. 102.

⁶ Consiglio regionale del Piemonte, Biblioteca Nazionale Universitaria di Torino, Centro Studi Piemontesi, Fondazione CRT, *Berlinghieri Geografia* (Torino 2006), pp. 44-5; Biblioteca Nazionale Universitaria di Torino, shelfmarks XV.I.41 and 42.

text pages in 1482. The third type of maps were printed together with the addition of the title in red by Giunti to complete the so-called second edition between 1516 and 1533.⁷ In total, thirty-one maps were added to the printed text. Due to the number of plates, the large formats, and the mentioned novelty of the intaglio technique, the printing must have been a mammoth task for Tedesco.

The copper plates and printing

Preparation and size of the copper plates

The maps for the *Geography* are each individually engraved on one copper plate. This can be deduced from the fact that there is no plate line visible in the center of the maps. No general uniform size plate seems to have been used for the different maps. On impressions of the world map no plate line of the copper plate is visible (Fig. 11, 497). This implies that the copper plate must have been larger than the paper. For the map *TABVLA DVODECIMA D ASIA* one of the smallest copper plates was applied, 33.9 x 37 cm. This can be deduced from the clearly visible margins (Fig. 498). For the maps *TABVLA QVINTA D EVROPA* and *SEXTA DE ASIA* plates measuring 48.3 x 29.8 and 52.8 x 38.8 cm were used (Fig. 499-500). A much larger copper plate than necessary was used to display the map *PALESTINA MODERNA ET TERRA SANCTA*, 51.5 x 41 cm (Fig. 501). The copper plate applied for the map *NOVELLA*



Fig. 497

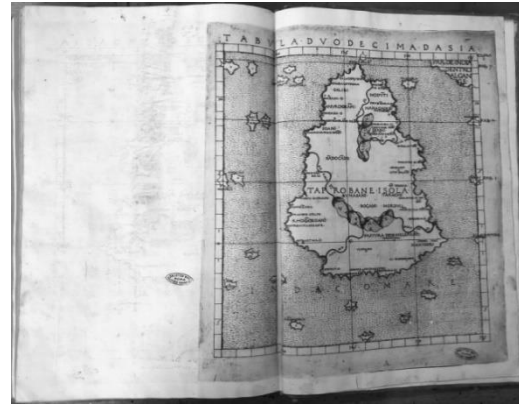


Fig. 498



Fig. 499

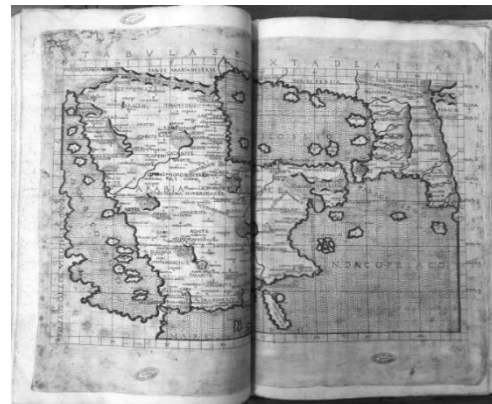


Fig. 500

ITALIA was hardly big enough to contain the map. This can be observed from the location of the title. On the left-hand side, the title has been crammed into the map instead of being placed above it. In many cases the dimensions of this map seem to have been too large for the paper, 55 x 41 cm. The complete image of the map was only visible when the paper was optimally positioned on the copper plate during printing and properly trimmed afterwards (Fig. 502).

⁷ Bernardo Giunti took over the printing house from his father in 1516 and published reprints of cartographic books, e.g. Pontanus and Mela, and Italian works until 1533, William A. Pettas, *The Giunti of Florence Merchant Publishers of the sixteenth century* (San Francisco 1980), pp. 55, 61, 65-72; Later the Giunti even petitioned to be allowed to print new first and last pages, not with the original dates, but with the current year. Books dated 1550 were thus changed to read 1565, *ibid*, p. 181.

copies in the Vatican City and a third one in Brussels.⁸ After cutting the paper in the middle and placing the maps in the right orientation, the latitudes end up at the outer sides on both maps. This was done on purpose to keep them visible after binding (Fig. 503). On many of the maps *TABVLA OCTAVA* and *NONA DASIA* the latitudes are not fully visible. The paper was clearly not large enough to get everything printed properly (Fig. 504-05). The latitudes are entirely visible on the photo with one of these two maps printed upside down (Fig. 503). This sheet of paper is about 3 centimeters wider than usual. It was the only one in this size in all the copies studied. The watermark in this sheet of paper was not detected in any other leaf used for the *Geography* (Fig. 234). The other examples were printed on paper in a regular size with the latitudes trimmed slightly into the image. The required size of paper needed for complete impressions of this specific copper plate was not taken well enough into account by the engraver(s) or printer. Maybe the designs used for the maps were considered as guiding in size, which would make the copper plate and paper of secondary importance. The same feature was also encountered on the world map.



Fig. 504

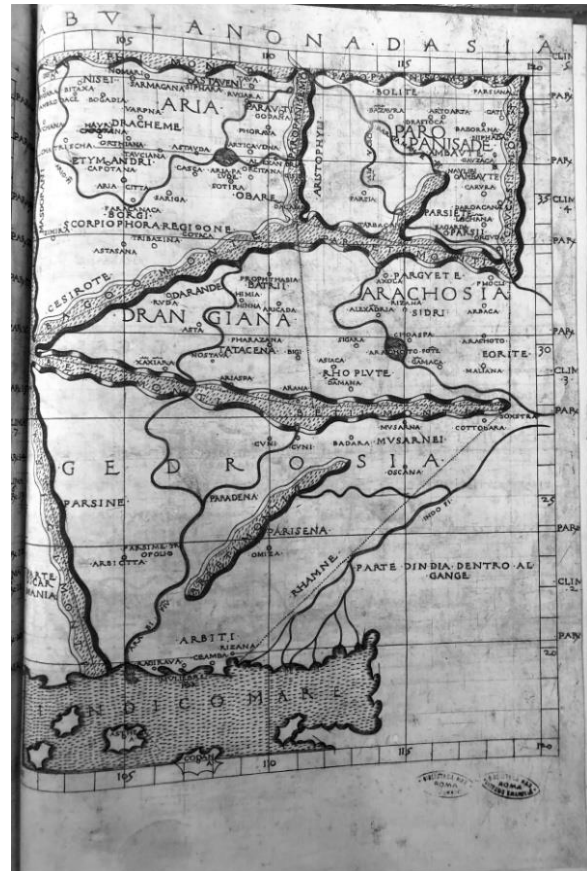


Fig. 505

Another striking aspect is the rough character of the copper plates. The impressions show very irregular borders and unburnished edges of the copper plate (Fig. 506). Traces of the work of the brazier are visible on the map *TABVLA SECONDA DE ASIA*. The copper plate was hammered so vigorously that it fractured. The printed image shows these cracks in the surface (Fig. 507). The process of beating the copper plates out will have resulted in quite thin plates, also because of the large surface they had to cover. This can be deduced from the moderate to weak impression of the copper plates in the paper (Fig. 508). It had its implications on the printing.⁹ Normally, after the hammering was finished, the surface had to be burnished and polished. By doing this, a smooth surface which would not interfere with

⁸ Biblioteca Apostolica Vaticana, shelfmark Stamp.Ferr.S.37; Biblioteca Apostolica Vaticana, shelfmark Stamp.Ross.301; De Koninklijke Bibliotheek van België, shelfmark Inc C 208.

⁹ The printing of very thin plates is quite difficult. In order to get the right pressure, the printing felt has to be raised with more sheets.

the engraved image could be created. In case of the *Geography*, this process appears to have been omitted, since the plates show many scratches and surface damages (Fig. 506-07).¹⁰

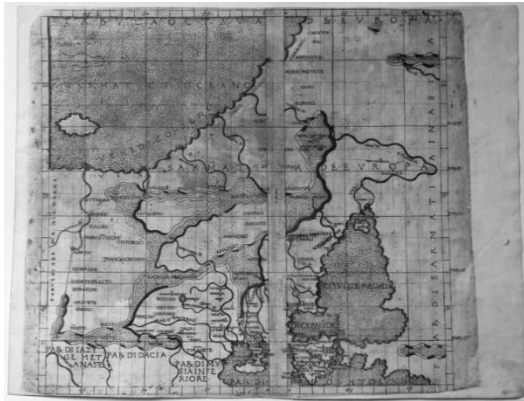


Fig. 506

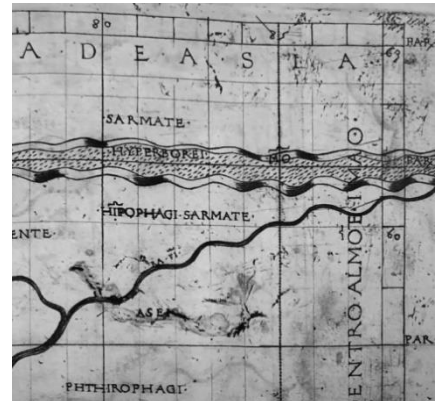


Fig. 507

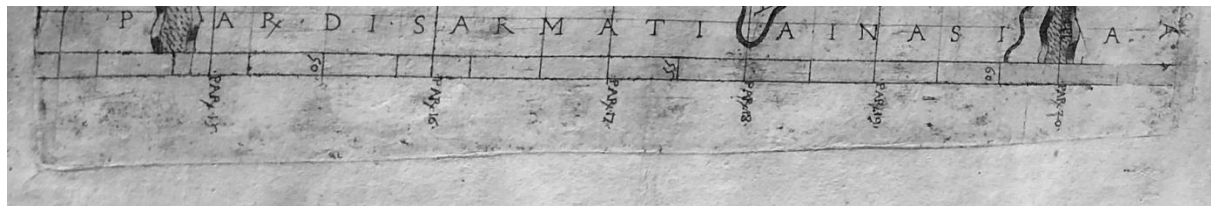


Fig. 508

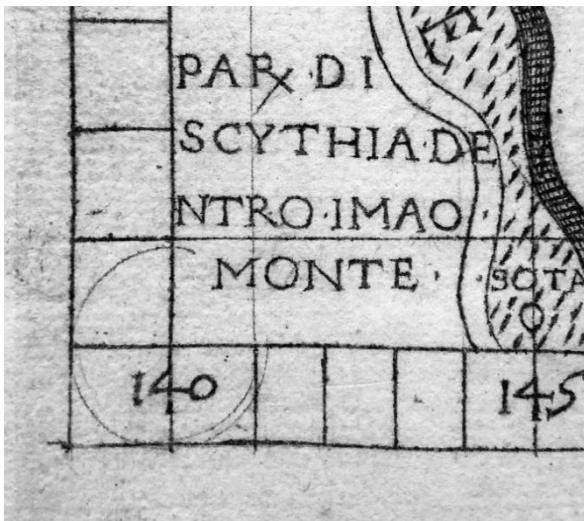


Fig. 509



Fig. 510

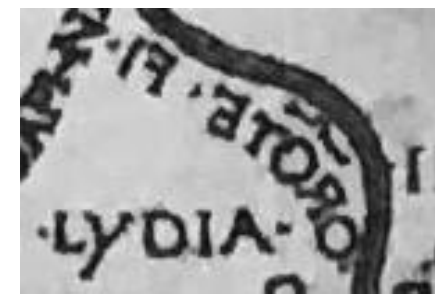


Fig. 511

The engraving

For the preparation of the engraving, the engraver could start in two ways. He could engrave straight after an example (drawing or painting), or he could prepare a model for (partial) transfer to the plate.¹¹ The first method would involve a considerable artistic and technical skill of the artist. Not only would he have to follow all the lines by eye, he also would have to mirror the image in the plate. Therefore, the second method was far more common. In most cases, a professional engraver, who would not necessarily be an artist, would be engaged by either author, publisher, or printer. He then would make

¹⁰ Roberts, op. cit. (n. 5), he also writes that burnishing has not been applied; *Printing a Mediterranean world: Florence, Constantinople, and the renaissance of Geography*, pp. 95-6; *Cartography between cultures: Francesco Berlinghieri's Geographia of 1482*, pp. 113-14.

¹¹ David Woodward, 'Chapter 22 Techniques of map engraving, printing and coloring in the European Renaissance', *The History of Cartography Volume three* (Chicago 2007), pp. 594-95.

or be supplied with a drawn copy of the subject. Sometimes, the drawing was coated with oil to make the image transparent. In many cases a schematic copy has been made. This was then rubbed with charcoal or chalk on the verso, making it into a sort of carbon copy.¹² By using a stylus, the lines could be traced and transferred to the copper plate. Due to the large images that had to be engraved, an image was transferred and engraved in several sessions. To keep the image at the same spot, a small aid or calibration mark could be used by the engraver. In Berlinghieri's maps, we found several of these marks in the form of faint circular forms in the corners of the printed images (Fig. 509). The larger outlines and structures were probably copied and transferred onto the copper plate. The toponyms were engraved directly into the plate, in contrast to the Rome editions of the *Cosmography* where letter punches have been applied.¹³ We also detected some traces of mirrored engraving (Fig. 510-11).

Some remarks in general can be made by observation. Berlinghieri appears not to have succeeded in contracting good engravers. The engraver or engravers show a general inadequacy in handling the burin. A very common sign of the inexperience is the way the burin has moved involuntarily, while being worked by the artist. This results in a sharp, straight line that goes nowhere (Fig. 512). A good engraver has complete control over his tool and spends much of his time sharpening it. The mentioned phenomenon occurs when tools are blunt, or in case there is lack of control or experience with the engraver. Before an engraver starts engraving an image, he sometimes tests his burin on the copper plate. We found a few of these test engravings in the margins of a map (Fig. 513). Normally, these small production traces would be burnished out of the plate before final printing, but in the *Geography*, they were left.

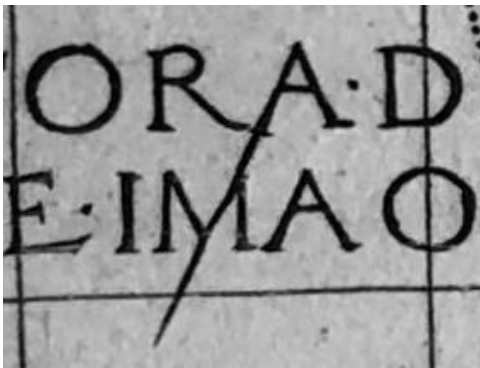


Fig. 512

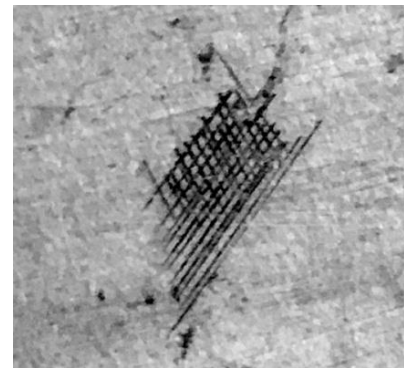


Fig. 513

The engravers

According to Roberts, Berlinghieri was looking for engravers and information about engraving given his letter to Bartolomeo della Scala of 1476.¹⁴ At the time, the knowledge and skill of engraving were already available among goldsmiths and some professional engravers. The engraver of the maps is disputed.¹⁵ Hind saw a similarity with the work of Francesco Rosselli.¹⁶ Boorsch based her arguments for Rosselli as the engraver also on stylistic similarities, for example the so-called broad manner style of the engravings.¹⁷ Rosselli was a very meticulous and experienced engraver, who hardly made any mistakes. However, the maps of the *Geography* show an abundance of corrected errors. Therefore, Almagià rejected the theory that Rosselli could have been the engraver.¹⁸ Boorsch states that there is no question of such a large number of errors.¹⁹ In his thesis, Roberts concludes against Rosselli as the engraver of the

¹² Woodward, op. cit. (n. 11), pp. 594-95.

¹³ Robert H.J. Peerlings, Frans Laurentius, Jaap van den Bovenkamp, 'The watermarks in the Rome editions of Ptolemy's *Cosmography* and more', *Quaerendo* 47, (2017), pp. 308-09.

¹⁴ Emil Jacobs, 'Zur Datierung von Berlinghieris *Geographia*', *Gutenberg Festschrift*, (1925), p. 249.

¹⁵ Suzanne Boorsch, 'The case for Francesco Rosselli as the engraver of Berlinghieri's *Geographia*', *Imago Mundi*, 56 (2004), pp. 152-69.

¹⁶ Arthur M. Hind, *Early Italian engraving* (London 1938), p. 292.

¹⁷ Boorsch, op. cit. (n. 15), p. 153.

¹⁸ Op. cit. (n. 2), p. 219.

¹⁹ Op. cit. (n. 15), p. 162.

maps of the *Geography*, mostly based on the same arguments as put forward by Almagià.²⁰ Moreover, Rosselli was not present in Italy in the years 1480-82. A tax document proves he was at the court of King Matthias Corvinus of Hungary. According to his brother Cosimo, he moved to Hungary because he was in debt.²¹ Boorsch puts forward one of Skelton's ideas that the maps may have been engraved already in 1479, before Berlinghieri left for Mantua.²² In that case Rosselli would probably not have been in debt.

It is possible that several engravers worked on the maps. Almagià argues this with the fact that differences in style are found on the maps of the *Geography*.²³ On the classic Ptolemaic maps, towns are depicted by an empty circle (Fig. 514). In contrast, on the *TABVLA SECVNDA DE EVROPA* a point is present in the middle of these circles (Fig. 515). Furthermore, the mountain ranges on the *TABVLA TERTIA D EVROPA* and *ASIA* and *TABVLA DVODECIMA D ASIA* are depicted as molehills comparable to the Rome editions of the *Cosmography* (Fig. 516). The other maps in the *Geography* have flattened mountain ranges with less perspective (Fig. 517).²⁴ Another example pointing to several engravers are the toponyms added on the north of the island of Sicily and the islands above Sicily on an early state of the map *TABVLA SEPTIMA DE EVROPA*. Two different styles are clearly visible here regarding the toponyms (Fig. 518). This is much less visible on a later state of the same map. Possibly it has been reworked (Fig. 519).



Fig. 514



Fig. 515

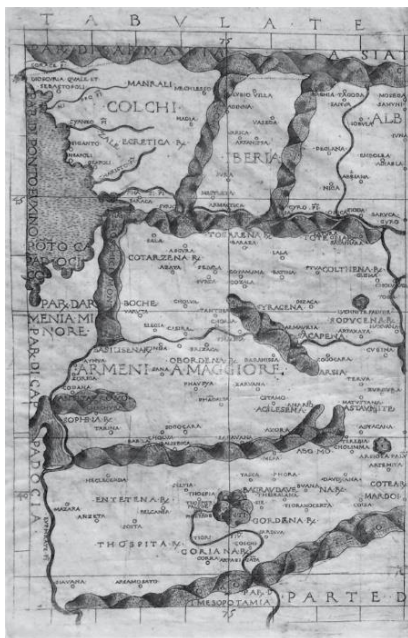


Fig. 516

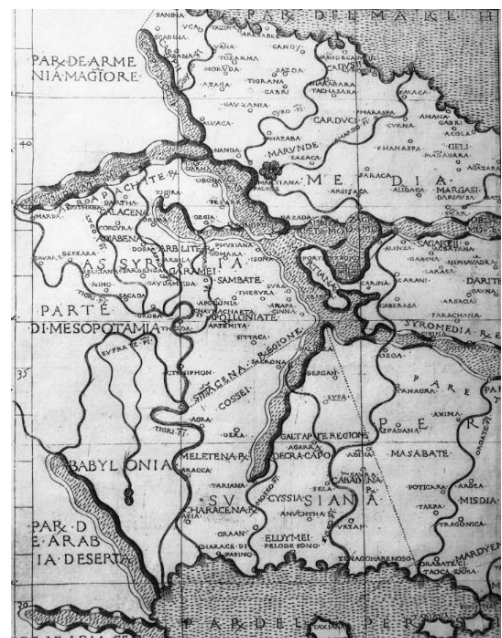


Fig. 517

²⁰ Roberts, op. cit. (n. 5), *Cartography between cultures: Francesco Berlinghieri's Geographia of 1482*, pp. 171, 179-85, 189.

²¹ Op. cit. (n. 15), pp. 165-66. In 1482 he was back in Florence and bought a house there, p. 155.

²² Claudius Ptolemaeus, *Francesco Berlinghieri Geographia Florence 1482*, with an introduction by Raleigh A. Skelton (Amsterdam 1966), p. VIII.

²³ Op. cit. (n. 2), pp. 218-19.

²⁴ Ibid, p. 227.



Fig. 518



Fig. 519



Fig. 520



Fig. 521



Fig. 522

We, in concurrence with Almagià, are of the opinion that several engravers worked simultaneously on these plates.²⁵ Since the maps mainly consist of linear text and depiction of borderlines, with only a few pictorial elements, it is almost impossible to identify the engraver or engravers. At the time, graphic artists made fairly small impressions.²⁶ Especially, the industry for niello plates, small decorative panels in silver or brass, was well developed during this period. These are in most cases no larger than a matchbox. There is a clear relation to the mentioned niello plates when looking at the forest depictions on the maps *GALLIA NOVELLA* and *TABVLA QVARTA D EVROPA* (Fig. 520-22). These match very well with several small niello plates in the collection of the British Museum.²⁷ In comparison with these, the sheer size of the copper plates used for the maps must have been a challenge for an experienced engraver, let alone an inexperienced one.

²⁵ Op. cit. (n. 2), p. 219.

²⁶ Arthur M. Hind, *A history of engraving and etching* (New York, 1963), pp. 37-44.

²⁷ See British Museum: https://www.britishmuseum.org/collection/object/P_1837-0616-374 and https://www.britishmuseum.org/collection/object/P_1845-0825-122

Skelton writes that it is not known when the maps were engraved, corrected, and printed. He has no explanation for the haste and carelessness that characterize the work. The maps are full of corrections and mistakes made by the engravers.²⁸ Perhaps the *Geography* had to be completed quickly before Berlinghieri left for Mantua in 1479.²⁹ According to Skelton, it would be plausible to assume that the maps were ready before the text was written, before June 1481, or maybe even earlier and at least before the Ulm edition of Ptolemy was completed on July 12, 1482.³⁰ We have already shown in the previous



Fig. 523

chapter that Skelton's assumptions are incorrect, as the text of the *Geography* was printed in 1482. In this chapter we will clarify when the maps were printed. Neither Skelton nor Almagià have an idea who the engravers might have been.³¹ According to us, Rosselli cannot have been the engraver of the maps of the *Geography*. We agree with Almagià that more than one engraver was involved in the project. Given the quality of the engraving and the errors in the titles, these were experienced but not very skilled engravers. They were probably not highly educated, but craftsmen. In accordance with Almagià and Skelton we also have no idea or clues as to who engraved the maps. Some final remarks concern the world map. This plate has gone through a higher degree of finishing. As if the copper plate was better prepared. The engraving also shows far fewer mistakes and corrections. Finally, it is striking that all the wind faces are engraved flawlessly (Fig. 523). Maybe a third and more experienced engraver was engaged for this plate.³²

The liber indication

The maps in Berlinghieri's *Geography* are all engraved on one copper plate except for the maps *TABVLA OCTAVA* and *NONA D ASIA*. The area in the middle of the maps between the two halves is blank, with exception of the lines representing the circles of latitude that run from left to right. Very often this part of the map was not visible, caused by the applied method of binding, or due to rebinding or restoration. When this part of the map was visible, a kind of page number, in fact the liber indication, could often be identified approximately in the middle. Probably, it was engraved to make the compilation easier for the binder. An example is *L III 12*, on the map *TABVLA OCTAVA DE EVROPA*, (Fig. 524). The



Fig. 524



Fig. 525



Fig. 526



Fig. 527

letter *L* stands for Liber, the Roman numeral *III* indicates the book to which it relates, and the Arabic numeral *12* represents the number of the map in the *Geography*. The eighth map of Europe is preceded by the first seven maps of Europe, the world map and three modern maps. Therefore, this map bears the number 12 instead of the number 8. On some maps this liber indication is missing (Fig. 525). Here, a

²⁸ Skelton, op. cit. (n. 22), pp. VIII, X-XI.

²⁹ Ibid, p. VIII.

³⁰ Op. cit. (n. 22), p. XI.

³¹ Ibid, pp. XI-XII.

³² Roberts, op. cit. (n. 5), *Cartography between cultures: Francesco Berlinghieri's Geographia of 1482*, pp. 186-89.

third type of map on the left (second state) is compared with a first type of map on the right (first state).³³ Figures 526 and 527 show examples of the world map. Both maps are of the first type and in the first state and belong to the earliest printed maps. Only on the map at the right, a liber indication is present. More maps in the first state, with or without the liber indication present, were found. This led to the

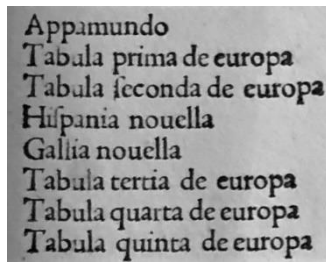


Fig. 528

conclusion that only the very first impressions from the first edition do not have a liber indication. It must have been added already in a very early stage. We have decided not to attribute an additional state to maps without a liber indication. The argument was that this could only be established by dismantling the earliest, richest ornamented, and illuminated atlases. Only then, we would have been able to check each map on the presence of a liber indication and the existence of an additional state for each map. Needless to say, we would never get permission and we would not dare to do so. The other reason to not attribute an additional state to maps without liber indication was that we would not be able to judge many maps regarding this characteristic as this part of a map often was not visible. Therefore, we would not be able to assign the correct state to a lot of maps. On unbound copies the presence of the liber indication is easy to determine (Fig. 524). When it is absent without any damage or erosion of the paper, it concerns an example of the earliest appearance of the map. To conclude, a difference has been discovered between the order of the maps according to the liber indication and the sequence printed on the page with the register and colophon. The liber indication positions the maps *HISPANIA* and *GALLIA NOVELLA* consecutive to the maps *TABVLA SECVNDA DE* and *TERTIA D EVROPA*. In contrast, according to the page with the register and colophon both *NOVELLA* maps are positioned in between the regular maps (Fig. 528). In this book we have applied the order in accordance with the liber indication on the maps. The reason to do so was that according to us the leaf with the register and colophon, although already printed by Tedescho, was only added to the second edition copies.

The toponyms

In the text on the maps numerous toponyms were found misspelled. Almagià described several examples in his article.³⁴ A few striking ones are the word *GALLIA*, instead of *HISPANIA*, in the title of the modern map of Spain. Another one is the word *ASIA* instead of *EVROPA* in the title of the map *TABVLA NONA D EVROPA*. He claims this is consistent in all copies. Burnishing was mentioned to have been applied to redefine geographical elements such as the contours of the coasts, or the routes of the rivers.³⁵ Almagià has the impression that both, the printing of the text, as well as the engraving of the copper plates, were done with great haste and sloppiness. He concludes that the maps have not been changed, after the scraping and corrections had been made. Thus, in his opinion no later revisions were applied.³⁶ This conclusion by Almagià is incorrect. For example, we found copies of, the map *TABVLA DI LIBYA SECONDA* with and without the letters *APHRICA* in capitals from left to right on the map, meaning that the copper plates have been adjusted.³⁷ More revisions and modifications will be described in the section about the states further on in this chapter.

Required time for engraving

Boorsch described a contract for an engraving between one Matteo de' Fedeli and engraver Bernardo Prevedari. The contract was concluded on October 24, 1481 in Milan. Prevedari was to render in engraving a drawing by Bramante, measuring 70.5 by 51.3 centimeters, and was to finish the job by Christmas. The contract stipulated that Prevedari was to work night and day and do nothing else during

³³ The different types of maps and states will be explained further on in this chapter in more detail.

³⁴ Op. cit. (n. 2), p. 217.

³⁵ Consiglio regionale del Piemonte, op. cit. (n. 6), pp. 44-5.

³⁶ Op. cit. (n. 2), p. 251.

³⁷ On this map of the Berlinghieri manuscript in the Braidense Library the word *APHRICA* is present also. On the map of the Berlinghieri manuscript in the Vatican Library *APHRICA MINORE* is applied.

that time. This contract shows that Prevedari was expected to engrave on average 60.27 square centimeters per day.³⁸ The drawing was made close to the time of Berlinghieri's *Geography*. The total area of engraved copper in the thirty-one maps is 43,336 square centimeters. Thus, the number of days it would have taken to engrave the thirty-one maps would have come to 719 days, about two years. One might argue that engraving a drawing is more complex than engraving maps. In that case, less time would be needed for the maps in the *Geography*. Woodward calculated that in Forlani's workshop around 1560 about 170 square centimeters could be engraved per day. To achieve this high production the labor had to be divided between apprentices for the more straightforward details and an experienced engraver for engraving the lettering and more difficult features.³⁹ Assuming six working days per week without interruption, this ends up to 255 days or about 43 weeks to engrave the maps. One can counter argue that Forlani's maps contain much more detail. On the other hand, with the *Geography* we are still at the beginning of cartographic engraving on copper.⁴⁰ From the information provided by Boorsch and Woodward can be deduced that the engraving of the maps for the *Geography* probably took between one and two years. The use of more artists at the same time may have speeded up the work. We are of the opinion that the engraving of the maps started after Berlinghieri returned from Mantua at the end of 1480. Thus, the job may have been finished at some point in 1482. That would coincide and be consistent with the printing of the text, which seems logical. The printing of the text was interrupted halfway Liber Secundus. According to us, the first maps were printed before the printing of the second half of the text was resumed.⁴¹ The type of adjustments to the maps indicate that they were implemented during an ongoing process and that they were related to the text and both manuscripts. Everything points out that the printing of the text and the engraving and printing of the maps took place in the same period during a coordinated process.

The paper

Apparently, no paper was ordered in advance for the maps. The printing of text is a different technique compared to the printing of copper plates. Text must be typeset first, which demands preparation and a certain period of time. After the text has been set, it can be printed fairly quickly. It is therefore logical to print text pages directly in the desired quantity, also to avoid differences. On the contrary, copper plates can be printed anytime but it requires much more time and effort compared to a text page. Tedescho had never printed such large copper plates before and almost no plates of these dimensions were printed at all in this period. He may have been cautious about ordering paper in advance because he first wanted to assess how they could be best printed. In addition, it was not known how well the atlases would sell. The printing of thirty maps from copper plates took about a day according to Woodward.⁴² The printing of the maps for one copy was therefore time consuming and expensive.

Printing of the copper plates

The dimensions of the engravings must have been immense for those days. Even later in the sixteenth and seventeenth century, when plate printing was a common practice, the printing of plates of big dimensions was something for specialized and experienced printers. Most impressions, from the period when the *Geography* was printed, were quite small. That made printing easier. Tedescho cannot be denied any innovation. He already experimented early on with the incorporation of engraved images in books. That was innovative. An early example is the book *Monte Santo di Dio* by Antonio da Siena from 1477. Perhaps, that was a reason Berlinghieri selected him to print the *Geography*. However, Tedescho experienced great difficulty with the combination of the two completely different printing

³⁸ Op. cit. (n. 15), p. 163.

³⁹ Op. cit. (n. 11), p. 596.

⁴⁰ Eleonora Azzini, 'Domizio Calderini e la recognitio tabularum Ptolemaei', *Tesi di Dottorato in Archivistica, e Biblioteconomia Università degli studi di Firenze*, M-STO/o8 (2010), p. 160.

⁴¹ This will be explained and substantiated in chapter eight on the manuscripts.

⁴² Op. cit. (n. 11), p. 597. The printing of thirty maps from copper plates took about a day according to Woodward. With one ream of paper Tedescho could print the maps for about sixteen atlases in sixteen days. With the same amount of paper, he could print one page of text in a print run of 500 in one day.

techniques in his edition of Dante's *La Divina Commedia*. Although the first images were really printed into the text, most of them were printed separately and pasted in the designated place or even left out. The intaglio printing of illustrations into a relief printed text, proved to be very difficult. The problem was only solved in the sixteenth century.⁴³ The text of the *Geography* lacks the geometric figures found in various printed editions of the *Cosmography*. This may be related to the problem with the integration of relief printing with intaglio printing described above. The different and less scientific character of the text of the *Geography* compared to the text of contemporary printed editions of the *Cosmography* can also be the reason.

Block print would have made matters much easier. Waldseemüller's maps show that the woodcut method can result in quite fine maps and images. By means of the woodcut method, the printing would also have been easier as one printing technique could be applied for the images as well as the text because both involve relief printing. In those days, the printers already had sufficient experience in printing type combined with woodcuts. The printing of intaglio plates combined with text was still quite in its infancy. At the time, this led to less professional results. Next to this technical problem, related to the integration of two different printing techniques, the printing of these extremely large copper plates must have been a challenge. It required a printing press with corresponding dimensions. Tedescho must have used or even devised himself something far larger than usual. One wonders if he was able to reach maximum or enough pressure at all to print these quite thin copper plates. By comparison, the copper plates used to print the different Rome *Cosmography* editions were half the size of those with which the maps for the *Geography* were printed.⁴⁴ In chapter five on the text we have described the imperfections and problems with the printing of the text in detail. All the imperfections, problems and features described in this chapter regarding the printing of the maps are comparable with those related to the printing of the text. We can conclude from this that Tedescho had not yet fully mastered both relief and intaglio printing.

Ink and printing

Traces of Tedescho's struggle with the printing of the maps can be found in several details. Normal printing ink for intaglio printing is made of linseed oil, boiled down to a thicker consistency, which is rubbed with black.⁴⁵ This black is based on carbon. In the seventeenth century carbonized apricot stones, or the sediment from wine barrels was used.⁴⁶ The resulting printing ink could not be stored for a long time, which meant that the process of ink-making and boiling of oil had to be repeated daily. This was indeed common practice by professional printers in the sixteenth and seventeenth century.⁴⁷ In the fifteenth century the process of making ink was still in its experimental stage. We do not know if linseed oil was boiled down, or even if this type of oil was used at all. There are however strong indications that indeed linseed oil must have been the main medium. This can be deduced from the archives of the Ripoli printing press.⁴⁸ Probably other oils were also tried and used. Comparably, experiments and tryouts apply to the black medium. The possibility that chimney soot or some other form of blackish medium was used, cannot be excluded.⁴⁹ When medium and oil are not rubbed long enough to be fully incorporated, the pigment will show itself as loose particles in the impressions. This inevitably leads to loss of black and contrast, resulting in a grey impression (Fig. 529). This also applies to the insufficient adding of black pigment to the oil. The combination of the variable factors like oil, medium, and daily ink production will have resulted in intaglio ink of an inconsistent quality and

⁴³ Theo, Frans Laurentius, 'Drukke Rembrandt ondersteboven', *Kroniek van het Rembrandthuis*, I (1994), pp. 43-6.

⁴⁴ Peerlings, op. cit. (n. 13), pp. 324-5; Donald L. McGuirk Jr., 'Ruysch World Map: Census and Commentary', *Imago Mundi*, 41 (1989), p. 133.

⁴⁵ Valeria Pagani, 'The dispersal of Lafreri's inheritance', *Print Quarterly*, Vol. XXV, nr. 1 (2008), p. 21, with the mention of a cauldron for boiling the oil from the workshop of Antonio Lafreri.

⁴⁶ Frans Laurentius, *Clement de Jonghe (ca. 1624-1677) Kunstverkopper in de Gouden Eeuw* (Houten 2010); p. 70.

⁴⁷ Laurentius, op. cit. (n. 46); pp. 69-71.

⁴⁸ Emilia Nesi, *Il diario della stamperia di Ripoli* (Firenze 1903), pp. 59-60; Melissa Conway, *The diary of the printing press of San Jacopo di Ripoli 1476-1484* (Firenze 1999), appendix VI, pp. 333-5, which shows regular acquisition of linseed oil.

⁴⁹ Nesi and Conway, op. cit. (n. 48), in some cases, there is documentation of the adding of a siccative like lead white to the ink for a quicker drying; Gutenberg for instance applied a siccative in his ink according to a scientific documentary:

https://www.youtube.com/watch?v=_x-7IOSNt44 or

https://programm.ard.de/TV/arte/gutenberg---genie-und-gesch-ftsman/eid_28724347121776

intensity at the time Tedescho was printing. Many Italian intaglio impressions from this period are indeed found in a range of quite grey to sometimes almost blueish impressions.⁵⁰ Some of the early impressions by Tedescho are printed quite black and compare favorably to contemporary impressions from Florence. Interestingly, the medium for the printing of type must have been oil-based too. Generally, this prints quite black. In the case of the *Geography*, the first and second type of maps, both printed by Tedescho, do not show much contrast. Part of this problem can also be ascribed to the quality of the printing press. Apparently, Tedescho could not exert enough pressure during the printing of the copper plates. He must have been aware of this issue and to keep as much printing ink in the engraved lines, a thin film of ink or plate tone was left on the plate surface. In most cases, the result will be a combination of the abovementioned factors. An additional indication of the inexperience with or the difficulty of the printing of these large copper plates may be the regularly found finger or thumbprints on the maps (Fig. 530).



Fig. 529

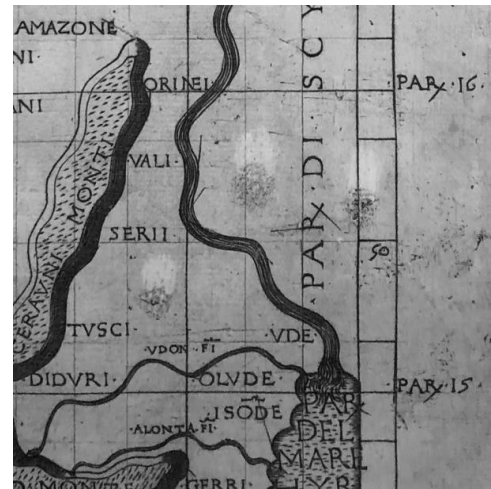


Fig. 530

Special features found on maps

The maps of the first edition were mostly backed with a second sheet of paper. This was applied to the maps intended to be coloured. In some cases, we detected traces of the use of a flattening stone to flatten folds in the paper after bonding (Fig. 531). Handwritten notes were sometimes present on maps (Fig. 532). We already described that all atlases were re-bound. Parchment of old manuscripts was found in some of the binding strips (Fig. 533). Also, an example of a tear in the paper at the plate line caused by the high pressure exerted during printing was detected (Fig. 534). If a map was folded together while



Fig. 531



Fig. 532



Fig. 533

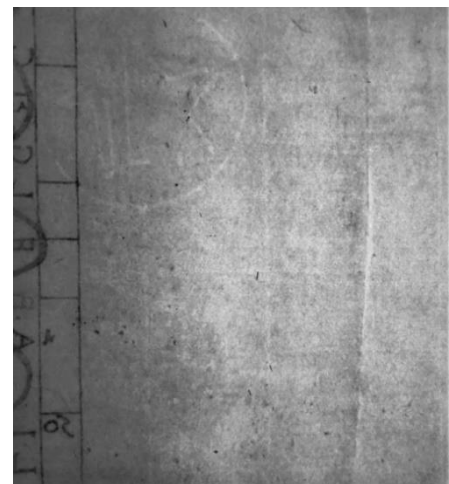


Fig. 534

⁵⁰ Hind, op. cit. (n. 26), p. 37.

the ink had not dried completely, a so-called *abklatsch* could be present on the opposite half of the map as on this example of the map *TABVLA QVARTA DE EVROPA* (Fig. 535). We found several impressions in which the engraved letters did not print well. The outlines are visible, but no black is present in the deepest part of the engraved line. This phenomenon is the result of either the insufficient pressure exerted during printing or the already mentioned quality of the printing ink (Fig. 529). In most cases, it

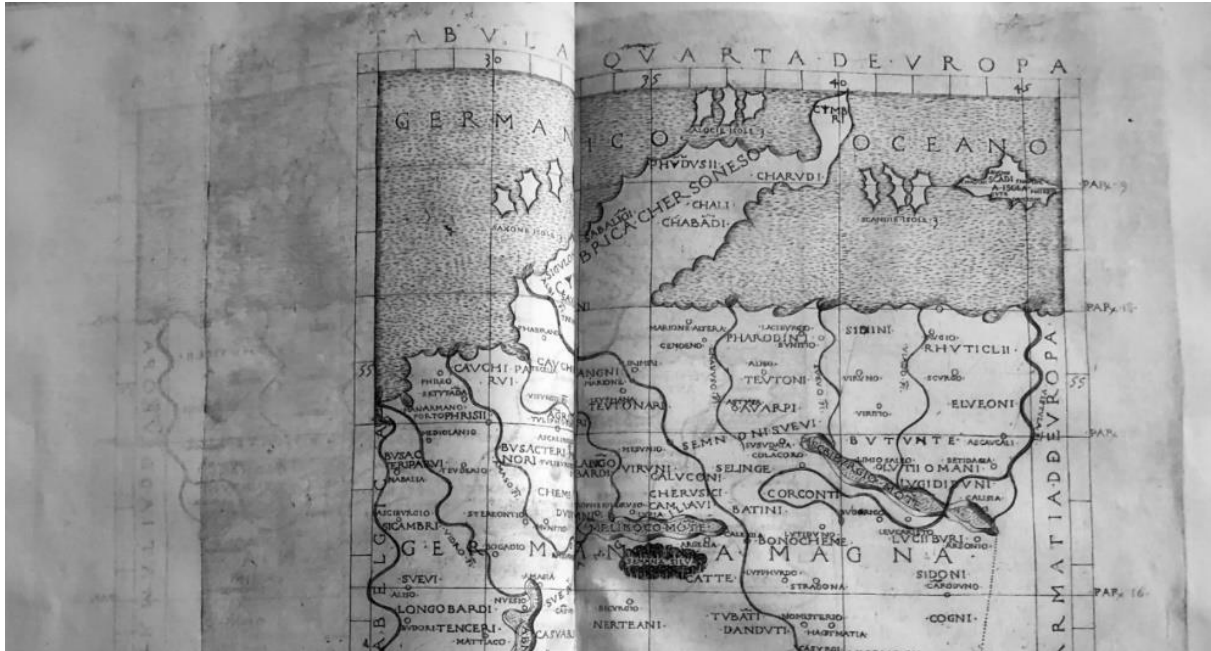


Fig. 535



Fig. 536

will be a combination of these two factors. Several examples were found of quite brown discoloured maps caused by aging of the bonding between the map and the sheet of paper the map is backed with. Examples of this feature on the recto of a map as well as on the backing are shown in figure 536 and 537. The pattern of the bonding shows that it was applied with a brush in several fluent and continuous movements on both halves of the map. Next, the sheet of paper the map was backed with was affixed. In figure 538 an example is shown of a map from which the backing has been lost or removed. The fluent and continuous movement with which the bonding was applied on the entire map is still recognizable. On both halves of



Fig. 537



Fig. 538

the map *TABVLA SEPTIMA DE ASIA* a scar made by a piece of textile saturated with an etching or corrosive liquid is visible (Fig. 539). This must have happened at the end of the second print run.⁵¹ This was established with an impression found in Venice, which was printed on paper with the watermark p in both halves of the map.⁵² Based on the watermark p present in both halves of the map this is a second type of map.⁵³ It was the only complete map of this type with the scar found by us. It implies that the incident with the cleaning cloth already must have taken place at the end of the second print run, since we observed this feature very rarely.⁵⁴ All maps of the third type are characterized by the scar (Fig. 540). Interestingly, a similar “accident” was found on a print from the same period in Florence.⁵⁵ It concerns a depiction of the prophet Elijah (Fig. 541). It is ascribed to the hand of the Florentine engraver Baccio Baldini (ca. 1436-1487). It must have been quite an aggressive agent to leave such a scar on the copper plate.

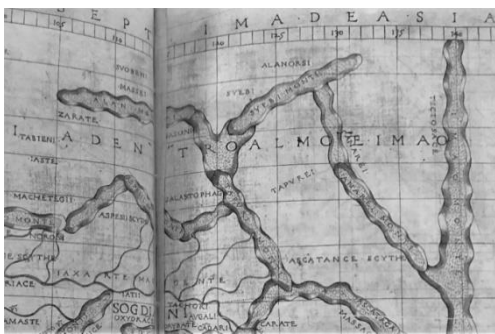


Fig. 539

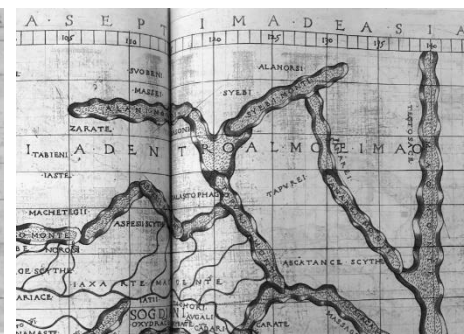


Fig. 540



Fig. 541

⁵¹ Op. cit. (n. 33).

⁵² Biblioteca Nazionale Marciana, shelfmark Inc. 0037.

⁵³ Op. cit. (n. 33).

⁵⁴ This was the only example of this artefact found, on a complete map of the second type. The scar was also found on the right half only of a map in a copy in the Vatican City. Based on the watermark P present in both halves of this map it is a second type of map. However, this map was composed of two halves of different origins based on the pattern of the glue, the difference in colouring and the way the bronze was applied on both halves of the map. That explains why the pattern of the cloth was only present on one half of the map; Biblioteca Apostolica Vaticana, shelfmark Inc.S.120.

⁵⁵ https://www.britishmuseum.org/collection/object/P_1845-0825-418; © The Trustees of the British Museum.

Characteristics of early impressions

Four maps in an atlas in London showed some specific features.⁵⁶ It concerned the maps *HISPANIA NOVELLA*, *TABVLA SEPTIMA DE EVROPA*, *TABVLA PRIMA DI LIBYA QVALE ET APHRICA* and *TABVLA DI LIBYA SECONDA*.⁵⁷ The impressions of these maps stood out, because they were very dark and intense. Another characteristic were the velvety printed edges of, for example, mountain ranges. This effect is caused by the presence of burr at the edges of freshly engraved lines. It retains ink and leads to somewhat blurred prints of the outline. This effect disappears rapidly as the burr wears away after a copper plate has been inked, wiped, and printed several times. Therefore, it is a sign of a very early impression (Fig. 542). On the map *TABVLA SEPTIMA DE EVROPA* present in this atlas in the first state, another example of early printing was found. The print of several toponyms at the top of the island of Sicily, as well as those in the small islands just above Sicily, were much darker, thicker and a bit velvety, compared to surrounding ones. It seems that those at the top were engraved and added somewhat later. Therefore, their appearance is a bit fatter and fuller, as described above. We found this effect in relation to some toponyms also on the island of Sardinia, on the other half of the map. An additional observation is that the signature of the ones added seems different compared to those already

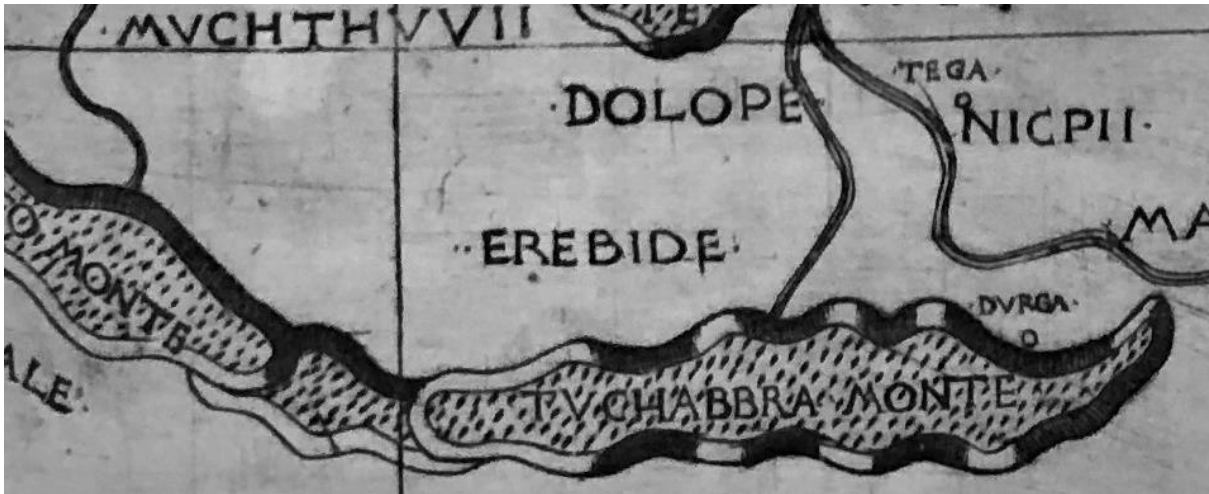


Fig. 542



Fig. 543



Fig. 544

⁵⁶ National Maritime Museum, shelfmark PBD 7690.

⁵⁷ A common characteristic of these four maps, as well as of the proof prints described further on, is that these maps are all printed on paper with the watermark shearer scissors. The same applies to the map *TABVLA SEPTIMA DE EVROPA* in the atlas of the Vatican Library described above. Thus, paper with this watermark seems to have been used for the earliest printed maps.

present (Fig. 543). This was also observed on the map *TABVLA QVARTA DI LIBYA*. The toponyms on this map that were added later in the north in the sea and in the north of the mainland are characterized by a somewhat different, sloppier, and more irregular spelling compared to the already present ones. This is based on the discovered proof impression of this map. It is an additional indication that multiple engravers must have worked on the engraving of the copper plates. The only other example of the map *TABVLA SEPTIMA DE EVROPA* in the first state was found in an atlas in the Vatican City.⁵⁸ On this map we see a phenomenon that can only be found on the earliest impressions, even earlier than the previous example. In the contours of two islands above Sicily white dots are visible. They are also present in the letters of the isle *LYPARI*. Additionally, some of the added toponyms are vaguely printed (Fig. 544). This is not caused by bad mixing of the ink or too little plate pressure applied during printing, but the fact that this toponym has just been engraved. The burrs from engraving have not been removed. As a result, these new toponyms print poorly until this burr is either polished off or worn away. This characteristic is present at several places on this map. Later, this drypoint effect becomes less pronounced and can be seen as the somewhat velvety print as present on the map of the atlas in London (Fig. 543).⁵⁹ Therefore, this map found in the Vatican Library must have been printed earlier than the one found in London.

States of the maps

It was always assumed that the copper plates of the various editions of the Rome *Cosmography* were never adjusted. However, Campbell has already described a few changes in the past although he could not specify when they occurred.⁶⁰ During our study of the different editions of the Rome *Cosmography* we discovered more changes.⁶¹ Furthermore, we were able to indicate when these adjustments have been made. Therefore, already at the start of our study, we decided to compare the maps of Berlinghieri's *Geography* from different copies. Based on our previous experiences we were convinced that multiple "editions" could be discovered.

Working method

At this early stage of our research, we did not yet have sufficient images of maps or atlases. Therefore, initially we focused on the two available facsimile atlases. The one from the Biblioteca Nazionale Universitaria di Torino is based on the copy offered to Cem, the son of Sultan Mehmed II.⁶² Some scholars assumed that Berlinghieri intended to dedicate the *Geography* to Sultan Mehmed II, who died in 1481. Therefore, we hypothesized this could have been a copy with early printed maps. The other facsimile atlas was based on a copy present in London with the title page in red and the page with the register and colophon.⁶³ In this second edition atlas possibly later maps from modified copper plates might be present. We decided to compare the images of these two facsimile atlases. We were aware that they were produced differently. The one in Turin was based on photos, whereas the one in London was a photolithographic reproduction. Thus, some caution in relation to the differences found had to be exercised. These could be real differences, but also variations caused by the different reproduction methods of the two facsimile atlases. Eventually, differences on all maps were detected between the facsimile atlases except for the maps *PALESTINA MODERNA ET TERRA SANCTA* and *TABVLA VNDECIMA DE ASIA*. It is an indication of a form of editing applied during printing. We also found indications of editing on the text pages. On some maps only a single difference was found on others many. We collected these different details and used them to assess the maps in the different copies studied during our trips. This led to the discovery of even more states of certain maps. Some features have been

⁵⁸ Biblioteca Apostolica Vaticana, shelfmark Stamp.Ferr.S.37.

⁵⁹ National Maritime Museum, shelfmark PBD 7690.

⁶⁰ Tony Campbell, *The earliest printed maps*, (London 1987), pp. 74-7, 124-27, 133-35.

⁶¹ Robert H.J. Peerlings, Frans Laurentius, Jaap van den Bovenkamp, 'New findings and discoveries in the 1507/8 Rome edition of Ptolemy's *Cosmography*', *Quaerendo* 48, (2018), pp. 151-53, 155-59.

⁶² Op. cit. (n. 6), p. 27; Biblioteca Nazionale Universitaria di Torino, shelfmark XV.I.42.

⁶³ The British Museum, shelfmark 163.b.1; Roberts wrongly mentions in his thesis that this facsimile atlas is based on a copy present in the British Library, shelfmark C.1.d.1; Roberts, op. cit. (n. 5), *Cartography between cultures: Francesco Berlinghieri's Geography of 1482*, p. 121.

modified several times. On the other hand, we also discovered that some of the differences were not real variations. They proved to be the result of the reproduction method applied to the facsimile atlases or manual corrections by previous owners. These variations were detected by for example small differences in the colour of the ink of the printed text and the later amendments. In the end, some differences in state were eliminated. Only features found identical several times and therefore not open to debate were used for the final state description. We had multiple images of most maps at our disposal. This way we were able to re-evaluate the state of the different maps retrospectively. In absence of an image, the map could not be reassessed. At the end of our study, we understood how and when the different states of maps came about. That facilitated the re-evaluation of states. With the knowledge acquired, we have also assigned a presumably correct description of the state to the maps of which no image was available, without a personal reassessment. In case of doubt, a question mark was added following the number of the state of these maps. The different states are described a bit further in this chapter. In table four, the states of all maps in the copies studied, are represented. With all this visually performed comparative research, the possibility of a missed state difference remains. Perhaps, in the future maps can be compared digitally. This might lead to the discovery of more states. Despite the limitations of the method applied, we are convinced that it will not lead to major changes in our results because our findings and conclusions are based on the combined evidence of three features. These being, the state of the maps, the different types of maps discovered, and the watermarks present in the paper of the maps. These last two features will be discussed further on in this chapter.

State differences

Several different kinds of corrections have led to state differences. Some were related to the titles of the maps. Others concerned geographical structures such as coastlines, lakes, islands, mountain ranges, and the like. The most common type of adjustments was related to the spelling and sometimes quite crude addition of toponyms. Finally, some state differences were based on other features. This last section concerns coincidental factors. Images of all different states of each map are presented and described in this chapter.

State differences in the titles

An overview of the titles on the printed maps is presented in attachment four. Differences related to the titles were found on six maps. The easiest one to explain was found in the letter *A* of the word *PRIMA* on the *TABVLA PRIMA DE ASIA*. That was due to a slip of the burin, thus a technical reason.⁶⁴ The correction of the letter *S* in the title of the *TABVLA SECONDA DE ASIA* might be traced back to an intended change of the number in Latin, which has not been implemented any further. The title of the map *HISPANIA NOVELLA* was initially and by mistake *GALLIA NOVELLA*. This can be deduced from the distribution of the letters in the title. The letters that make up the word *GALLIA* were regularly distributed from left to right. The letters needed to make it *HISPANIA* are squeezed in between, leading to a more irregular distribution. No example of a map with the incorrect title *GALLIA NOVELLA* and without corrections on the map was found in the copies studied. It is the only variant relating to the title of which we have not found an example. The titles of the maps *TABVLA SEXTA* and *NONA D EVROPA* were first *DE ASIA*. Each of them has been corrected differently.⁶⁵ Examples of each variant of these titles were found. The letters of the word *ASIA* are regularly distributed from left to right. The letters used and added for the corrections are more irregularly distributed. Therefore, it must be concluded that the word Asia was engraved first. For some reason, the wrong title was placed on these maps. Although we cannot explain this anomaly, we suspect it is related to the working method. Possibly, someone engraved the

⁶⁴ The images belonging to each described state of all the maps can be found further on in this chapter displayed for every individual map.

⁶⁵ On the sixth map of Europe the first part of the letter *A* was used to form the second part of the letter *V*, the rest of the letter *A* was erased and the letter *S* became an *O*. On the ninth map of Europe the *V* was added in between the *E* and *A* and the *A* was completely erased. Further the letter *O* was added just behind the letter *S* and the *S* was erased. In subsequent states these corrections became visible again leading to a combination of the letters *V* and *A* and the letter *S* printed in the *O* on the sixth map of Europe and the word *EVARSOPA* on the ninth map of Europe.

land masses, mountains, and seas. Another person may have engraved the toponyms and the titles above the maps. Obviously, this led to some mistakes. A lack of cartographic knowledge of the engraver is another possibility. The variations related to the title of the map *TABVLA QVINTA D EVROPA* can be clarified. Initially, the title was engraved correctly. However, *D EVROPA* was changed into *DE ERVPA* and back into *D EVROPA* but now with a visible combination of the letters *V* and *E* in the *V* and the letters *O* and *V* in the *O*. According to us, this adaptation, and the correction back to the original must be related to the presence of the manuscript of Berlinghieri's *Geographia* intended for Lorenzo de Medici in Tedescho's printing office.⁶⁶ More than twenty digital versions of manuscripts of the *Cosmographia* and *Geographia* were found on the internet. The manuscript intended for Lorenzo de Medici was the only example found with the word *ERVPA* applied for the title of the map *TABVLA QVINTA D EVROPA*. Apparently, this was "corrected" in the printed edition. Possibly by someone less educated and probably after this person faced the manuscript. Subsequently, this "correction" was reversed again. It is an indication of a form of editing applied during printing. We also found indications of editing on the text pages.

State differences in geographical structures

The second type of adjustments, leading to different states, were related to the display of land, rivers and seas, and mountains. In the second state of the map *TABVLA QVARTA D EVROPA* two rivers have been turned into a mountain range on the right half of the map at the lower border of the map. We found no example of this in any digitally available manuscript. Perhaps this adaptation was a personal interpretation of the engraver. The same applies to the mountain range at the top on the right half of the map *TABVLA OCTAVA DE EVROPA* in the first state. The mirrored representation of this mountain range in the sea, on the left half of the map in the second state, was also not detected in any manuscript. Again, this might have been an interpretation or mistake of the engraver. The indentation in the land mass of Italy found on the left half of the map *TABVLA QVINTA D EVROPA*, added in the second state, is not related to both manuscripts of the *Geographia*. However, examples of this variation were present in other manuscripts.⁶⁷ Therefore, we assume that the presence of, or the knowledge about, some manuscripts might have given rise to the adoption of this modification. A comparable indentation was added to the map *TABVLA NONA D EVROPA*, in the second state. It is present in the land mass of Turkey, in the right corner at the bottom of the map, on the right half of the map. This indentation was also found on the corresponding map in the manuscript of the *Geographia* destined for Federico d'Urbino.⁶⁸ It was not present in the manuscript reserved for Lorenzo de Medici.⁶⁹ The opposite applies to the island added to the map *TABVLA DECIMA DE EVROPA* in the second state. This island is present on the corresponding map of the manuscript for Lorenzo de Medici, but not in the one for Federico d'Urbino.

State differences in toponyms

Multiple toponyms have been modified on the maps. On the map *TABVLA QVINTA D EVROPA* in the first state the toponyms Delminio, Erona, and Alet were engraved. They were adjusted several times from state to state. We looked at the spelling in the gazetteers and found Delminio, Erona, and Aleta. The adaptation of Alet to Aleta seems justified. However, that does not apply to Delminio's and Erona's adjustments back and forth, from state to state. Some other examples are Oreno on the map *TABVLA SEPTIMA DE EVROPA* and Gango on the map *TABVLA DVODECIMA D ASIA* in the first state. They were adapted to Orino and Gange on the maps in the second state, in accordance with the spelling

⁶⁶ Biblioteca Nazionale Braidense Milano, shelfmark AC.XIV.44.

⁶⁷ The Greek manuscript from Chrysoloras, Urbinas Graecus 82, is present in the Vatican Library and can be consulted digitally: https://digi.vatlib.it/view/MSS_Urb.gr.82;

Biblioteca Apostolica Vaticana, shelfmark Urb.lat.277: https://digi.vatlib.it/view/MSS_Urb.lat.277;

Florence Biblioteca Medicea Laurenziana, shelfmark Plut.30.1: <http://mss.bmlonline.it/?&search=plut.30.1>

⁶⁸ Biblioteca Apostolica Vaticana, shelfmark Urb.lat.273. It can be consulted digitally:

https://digi.vatlib.it/view/MSS_Urb.lat.273

⁶⁹ Biblioteca Nazionale Braidense Milano, shelfmark AC.XIV.44.

in the gazetteer. In contrast, the spelling of Navstathmo on the map *TABVLA TERTIA DI LIBYA* and Chavrina on the map *TABVLA NONA D ASIA* corresponds to the spelling in the gazetteer. Nevertheless, the spelling was adapted on maps in the second state. Thus, in some examples the spelling of toponyms on the maps seems to be adapted conform the spelling found in the gazetteers of the text pages. However, examples of the opposite were found as well. On many maps corrections of toponyms were found for all states. In view of the above, we also studied these corrections even though they did not lead to state differences. An arbitrary example is *CAPATIO* with a combination of the letters *A* and *I* in the second *A* on the map *TABVLA SEPTIMA DE EVROPA*, a bit left from Mount Etna (Fig. 518-19). In the gazetteer the spelling was *CAPITIO*. A possible example of the opposite was also found. On the map *TABVLA DVODECIMA D ASIA* Galiba Extrema was engraved and printed, whilst the spelling Galiba Exrrema was found in the gazetteer. This example can also be due to a typesetting error in the gazetteer. The variations in the toponyms on the maps can be explained using various manuscript-maps as examples instead of the gazetteers.⁷⁰

State differences caused by other features

The first feature, determined as a difference in state, was based on the loosening or disappearance of presumably lead used to cover an engraving error. It concerns the map *TABVLA SECONDA DE ASIA*. On the right half of the map, at the far right against the edge of the map, text is printed vertically. On the first type of maps in the first state, the map is blank between the words *SCYTHIA* and *DENTRO*. On the second type of maps in the second state, ghost images of letters, to a greater or lesser extent, appear between these two words. On the earliest printed maps of the third type, the image is more or less equal to that of the second type. On the last printed maps, the masking agent has disappeared completely. Therefore, *DENTRO* was clearly legible twice on these maps. This indicates that *DENTRO* probably was engraved double from the beginning. The material applied to mask the double engraving disappeared, first partly and eventually completely during the printing of the third type of maps by Giunti in the sixteenth century. It concerns a repair, which wears out in the later impressions. Burnishing the copper plate is a way to make corrections invisible. If this method had been used, the corrections could not have reappeared on later states of maps. Other ways to hide corrections were to fill the lines and plate damages with wax, lead, or solder. We assume that in this example it must have been lead or solder. Wax would have fallen off much earlier by the use and the pressure exerted on the copper plates during printing. The second artefact is a very particular one. It was found on the map *TABVLA SEPTIMA DE ASIA*. On both half of the maps, the traces of a textile cloth are clearly recognizable (Fig. 539-40). Probably a cleaning cloth with a corrosive agent was left on the copper plate. From that moment on, all maps show the imprint of this wiping cloth. The imprint is present on all maps of the third type.

Intentional adjustments during printing

A striking modification concerned the wiping of ink with a hand or a piece of cloth. An extreme example is shown in figure 545 and 546. This treatment must have been intentional. The slips with the burin related to the letter *A* on the maps *TABVLA PRIMA DE ASIA* and *OCTAVA D ASIA* are another example of intentional adjustment. These mistakes are not visible on maps of the first type in the first state, in contrast to maps of the second and third type in later states. It does not make sense to assume that these slips of the burin were added later. They must have been present from the start. Thus, they must have been made invisible on maps in the first state. In this case, the ink of the deeply engraved lines was locally wiped off with a cloth to hide the scar (Fig. 547). Another explanation may be the use of wax to mask the corrections and adjustments.

The same applies to the title of, for example, the map *TABVLA NONA D EVROPA*. It changes from *ASIA* to *EVROPA* on the first type of maps in the first and second state without any visible trace of the correction. A combination of *ASIA* and *EVROPA* was present on the second and third type of maps,

⁷⁰ This will be further discussed in chapter eight on the manuscripts.

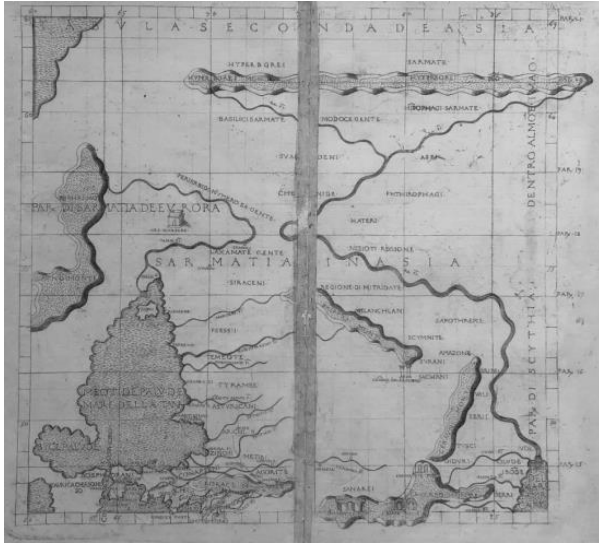


Fig. 545

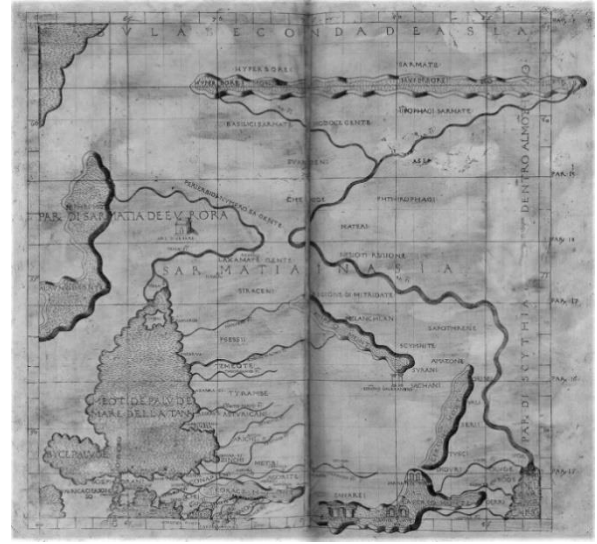


Fig. 546

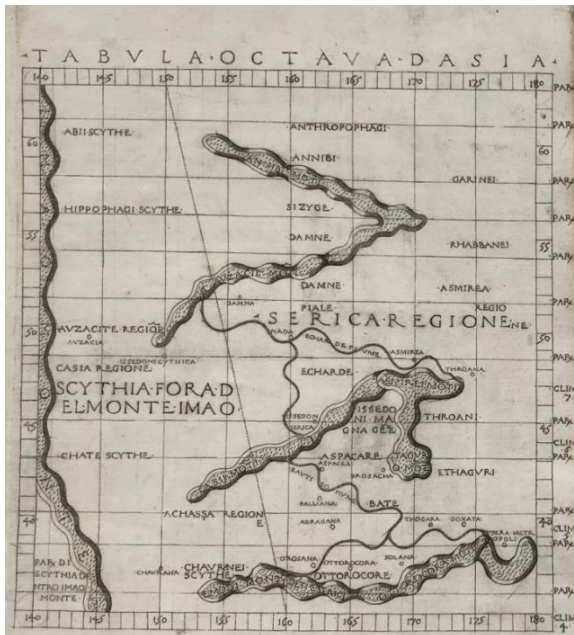
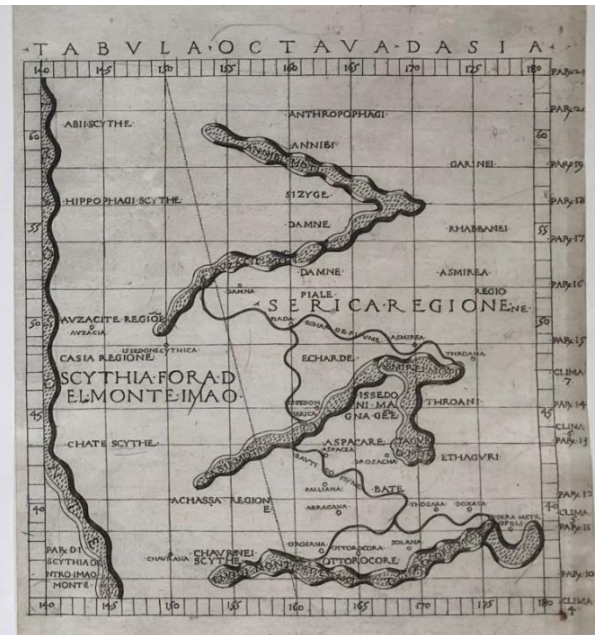


Fig. 547



both in the third state. Again, it is not likely that the combination of *EVROPA* and *ASIA* was engraved this way. It was rather the result of a combination of the original engraving and the corrected one. Again, the reason that it was not visible on the first type of maps must have been that the ink has been removed locally or that perhaps even faulty lines were filled with a substance like wax. It is far too difficult and time-consuming to wipe away the ink in between the letters in the title. On maps of the second type these erroneous engravings related to the titles are fully visible. Therefore, in this example the use of a more temporary filling agent like wax is more likely than the application of lead or solder.

On some maps, lead white was applied to mask irregularities and adjustments (Fig. 548-50). We do not know by whom and when it was applied, nor was it found generally. So, we cannot draw any clear conclusions from it. A final phenomenon that requires explanation is that corrections were sometimes visible, less visible, or not visible at all, including ghost images at the location of these corrections. These did not appear to be differences in states. The answer was found on the maps printed some forty years later by Giunti, the third type of maps. At that time, it had become customary to heat the copper plates a bit before printing. This way they would print better. In case wax was used to mask things, it must have disappeared when the copper plates were heated. Giunti also used a darker better prepared ink, which he applied richly to the copper plates (Fig. 551). Further, more pressure was exerted during printing.



Fig. 548



Fig. 549



Fig. 550

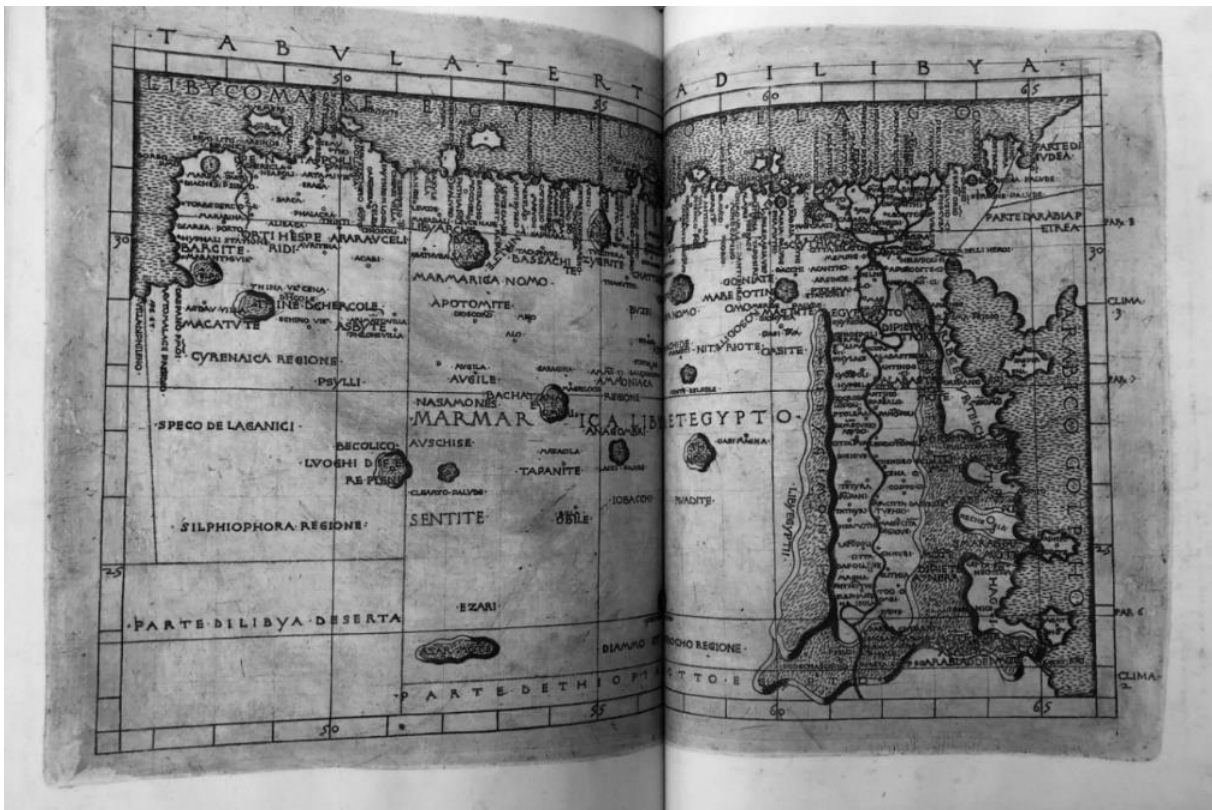


Fig. 551



Fig. 552

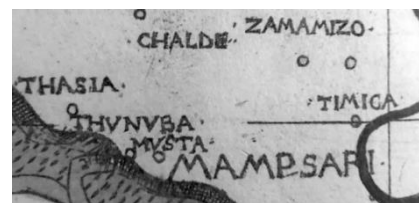


Fig. 553

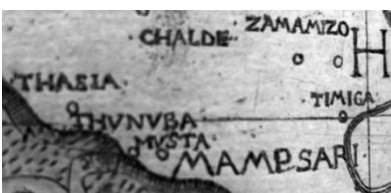


Fig. 554

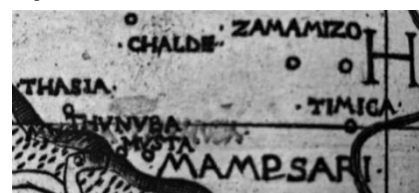


Fig. 555

Therefore, all the corrections and adjustments made on the copper plates were very visible on these third type of maps. An example of the feature described above is shown in figure 552-55 of the map *TABVLA*

DI LIBYA SECONDA. Many more details of the copper plates were expressed on the third type of maps. After thorough comparison, we discovered traces of these details as well on maps of the second and incidentally the first type. Therefore, we decided to exclude them as differences in state. Figure 552 shows the first state of the map *TABVLA DI LIBYA SECONDA* with the toponym *MVSTA* printed to the left of *THVNVBA*. Figure 553 shows the second state with *MVSTA* printed below *THVNVBA*. Figure 554 represents an example of the third state recognizable by the addition of the capital *H* of *APHRICA* printed from left to right on maps of the third state. Figure 555 clearly reveals a ghost image of the earlier changes and corrections related to the toponyms *MVSTA* and *THVNVBA*. The existence of a fourth state seems justified. However, we have decided otherwise and did not add a fourth state of this map. The reason to do so was the fact that the ghost image was also visible on some maps of the second state and in some cases less visible on maps of the third state. More examples of this same feature were observed on other maps as well.

A remarkable discovery of proof impressions

The atlas present in the National Maritime Museum in London needs special attention for several reasons.⁷¹ Three very remarkable and exceptional examples, *GALLIA NOVELLA*, *TABVLA SEXTA D EVROPA*, and *TABVLA QVARTA DI LIBYA* were detected in this atlas (Fig. 556-58). The development of states, described above, was based on relatively few and small changes between the different states of maps. These three maps were clearly found in an obvious unfinished state predating all mentioned changes. The numerous differences detected on these maps are described in attachment five. Some of the most remarkable examples of deviations are the complete lack of a title above the map *GALLIA NOVELLA*. On the map *TABVLA SEXTA D EVROPA* the title *TABVLA SEXTA DE ASIA* was engraved and printed. This map was the only example found with this aberration. On the map *TABVLA QVARTA DI LIBYA* the toponyms for and in the islands, just below the title of the map, were not yet



Fig. 556

⁷¹ National Maritime Museum, shelfmark PBD 7690.

[illegible]

Fig. 558

present, as well as the names of the seas on the upper half of the map. Thus, these three maps appear to be trial specimens or proof impressions. We did not find any other atlas with maps in this early unfinished stage of development. To emphasize their exceptional character, we decided not to qualify these three maps as first state but as impressions of proofs.⁷² Not only do they illustrate the work in progress on these maps, but also the presence of proofs from this period is almost unique. Many prints from this early phase of intaglio printing in Italy and indeed Europe are known in most cases in only one impression or even a fragment. The presence of proofs and the possibility to determine the different states makes this a very important find. Apparently, both Berlinghieri and Tedescho did not have issues with the incorporation of unfinished impressions of the maps in a copy of the *Geography*.⁷³ These early proofs were not discarded, but used to compile an atlas. Therefore, it cannot be excluded that more proofs of other maps, or proofs at a different stage can be discovered in other atlases not studied by us.

Concluding remarks

From the first two types of adjustments, that led to state differences, can be concluded that they seem to have been made on an ad hoc basis from correct, to incorrect and vice versa. Regularly, remnants of earlier work, in some cases combined, are visible. For example, titles of maps were corrected from *ASIA* to *EVROPA* and a combination of the two, or from *EVROPA* to *ERVPA* and back again to *EVROPA*. Land, sea, mountains, and islands seem to have been adapted or added, probably based on available examples. Occasionally, according to the manuscript version of the *Geographia* for Federico d'Urbino, but sometimes in conformity with the manuscript intended for Lorenzo de Medici. Additionally, adjustments were found that cannot be traced back to either of them. The toponyms on the maps, the third type of adjustment, seem to have been derived in most cases from those in the gazetteers. However, examples of the opposite were also found. In brief, some adjustments were improvements, others were errors, some seem to have been knowledge based and others were accidents. Many changes are irrational and seem inexplicably, such as the presence of the word *ASIA* in the title of the maps *TABVLA SEXTA* and *NONA D EVROPA*. Therefore, we have limited ourselves to describe these differences, instead of trying to explain them. The fourth type of "modifications", in fact artefacts, was only found on the third type of maps. Based on the combination of features it can be concluded that intentional adjustments of the copper plates were only made during the first phase of printing of the first type of maps. Almagià's assumption that the maps are full of corrections and adjustments and that they remained as they were from the start of printing, must be revised.⁷⁴ The finding of multiple states of maps in the *Geography* is consistent with the findings regarding other contemporary editions of the *Cosmography* printed in Bologna, Rome, and Ulm.⁷⁵ In the previous chapter on the text and the gazetteers we have described that flaws, as well as intentional adjustments were found in the text of the different extant copies. Obviously, each printed leaf of text, with or without errors or adjustments, was used and bound. The same applies for the maps.

⁷² All three were printed on paper with the watermark shearer scissors.

⁷³ It is in itself a rarity to find proof impressions of this type of early graphic art.

⁷⁴ Op. cit. (n. 2), p. 251.

⁷⁵ Peerlings, op. cit. (n. 61), pp. 151-53, 155-59. The adjustments of the copper plates of the Rome editions of the *Cosmography* did not take place until the 1507 and 1508 issues.

States according to Peerlings

World map two states

On the left half of the map, at the right side of the red sea, below ARABIA FELICE obliquely printed:

First state Prion (Fig. 559)
Second state Priono (Fig. 562)

On the left half of the map, in the middle, in between LIBYA DESERTA and CHELONIDE PALVDE:

First state right lake almost absent (Fig. 560)
Second state right lake clearly printed (Fig. 563)

On the right half of the map, at the right side, just above and to the left of the wind-face Cecia:

First state in the curved border of the map with the parallels, between 14 and 16 the number 15 is as should be (Fig. 561)
Second state in the curved border of the map with the parallels, between 14 and 16 the 5 of 15 is adjusted (Fig. 564)



Fig. 559



Fig. 560

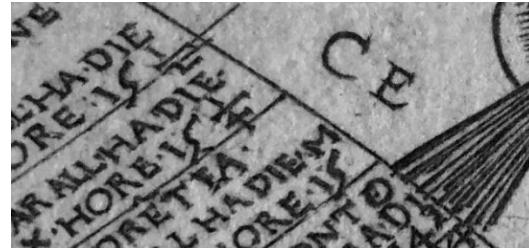


Fig. 561

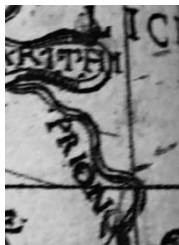


Fig. 562



Fig. 563

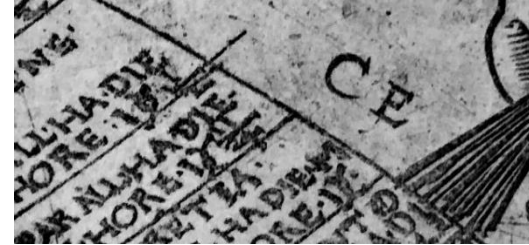


Fig. 564

Europe 1 two states

On the left half of the map, in the middle, at the bottom of IBERNIA ISOLA:

First state VSDIE (Fig. 565)
Second state VSDEE with a vague I above and through the first E (Fig. 566)

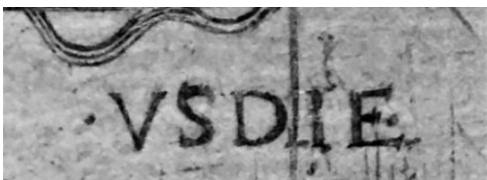


Fig. 565



Fig. 566

On the right half of the map, at the bottom of the map:

First state BELGICA and GERMANIAMAGA (Fig. 567)
Second state corrections in the B and G of BELGICA and in the A of GERMANIAMAGA (Fig. 568)

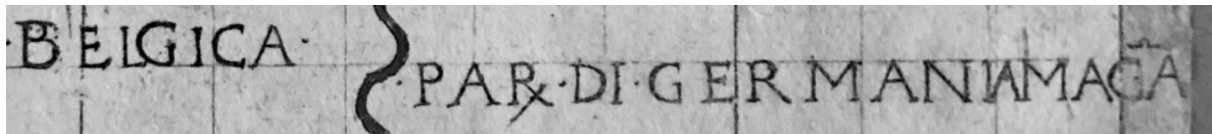


Fig. 567

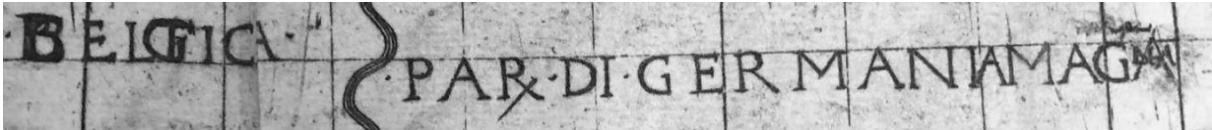


Fig. 568

Europe 2 two states

On the right half of the map, above the obliquely printed *BALEARICO PELAGO*:

First state on the largest island two toponyms *PALMA* and *POLETIA* (Fig. 569)

Second state on the largest island two additional toponyms (Fig. 570)

On the right half of the map, above the obliquely printed *BALEARICO PELAGO*:

First state above *PALMA* sea (Fig. 569)

Second state above *PALMA* expanded contours of the island in the sea (Fig. 570)



Fig. 569

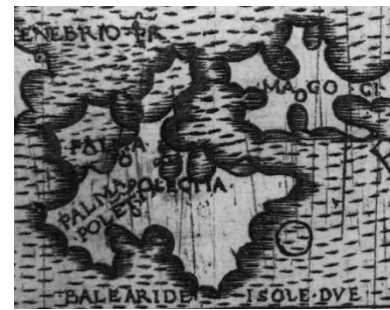


Fig. 570

Europe 2 modern two states

In the title of the map:

First state the second letter looks like a C (Fig. 571)
 between the the letters S and P no additional letter present
 the first N is a normal letter N

Second state the N of Novella is a normal letter N
 the second letter is a G (Fig. 572)
 between the letters S and P an additional A is present
 the first N is a combination of the letters N and L
 the N of Novella is a combination of the letters N and M



Fig. 571



Fig. 572

Europe 3 two states

On the right half of the map, just below GALLIA NARBONENSE and LEMANO LACO:

First state TRICASTINI (Fig. 573)

Second state TRICASTINI with a combination of the letters C and I in the C (Fig. 574)



Fig. 573



Fig. 574

Europe 3 modern two states

On the right half of the map, just below the middle of the map, toward the middle of the map, obliquely printed:

First state GASSA (Fig. 575)

Second state BASSA (Fig. 576)

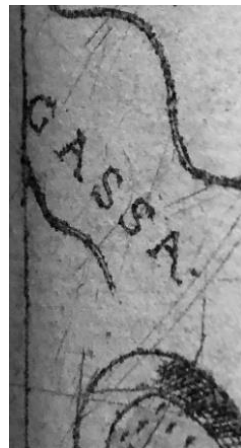


Fig. 575

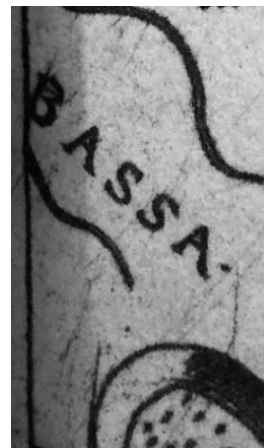


Fig. 576

Europe 4 two states

On the left half of the map, at the top, below SAXONE ISOLE, obliquely printed just below the coastline:

First state CIM (Fig. 577)

Second state CYM with a combination of the letters I and Y in the Y (Fig. 578)

On the left half of the map, in the middle of the map, just to the right of the top of the mountain range, toward the middle of the map, obliquely printed:

First state SVEVI (Fig. 579)

Second state SVENI with a combination of the letters V and N in the N and an additional V above the N (Fig. 581)

On the right half of the map, at the top of the map, right in the middle:

First state CIMBRI (Fig. 580)

Second state CYMBRI with a combination of the letters I and Y in the Y (Fig. 582)



Fig. 577

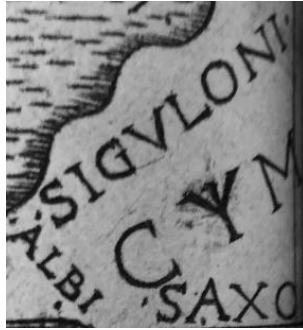


Fig. 578

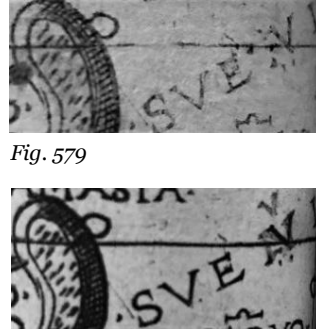


Fig. 579



Fig. 580



Fig. 581



Fig. 582

On the right half of the map, in the middle of the map, toward the middle of the map:

First state LACCO BARDI (Fig. 583)

Second state LANGO BARDI with a combination of the letters C and N in the first C and a combination of the letters C and G in the second C (Fig. 586)

On the right half of the map, at the bottom of the map, just below and between the two woods:

First state PHELICIA with the letter H somewhat between a H and a M (Fig. 584)

Second state PHELICIA with the letter H somewhat between a H and a M and an additional H above the letter H or M (Fig. 587)

On the right half of the map, at the bottom of the map, toward the middle:

First state DIV LICIA (Fig. 585)

Second state DIV LINA with a combination of the letter N with the the letters C and I and lowercase letters ci engraved above the N (Fig. 588)

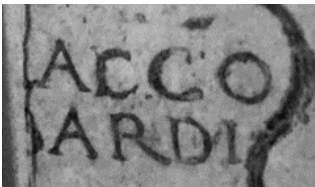


Fig. 583

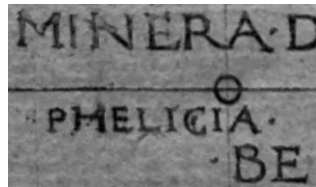


Fig. 584

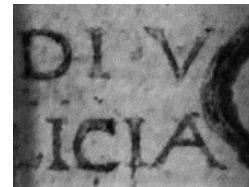


Fig. 585



Fig. 586

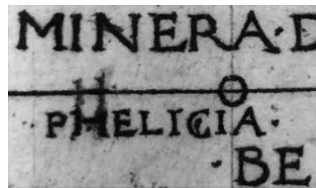


Fig. 587



Fig. 588



Fig. 589

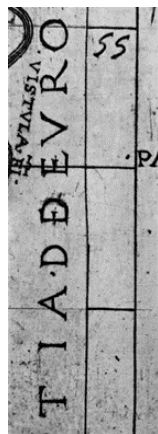


Fig. 590



Fig. 591



Fig. 592

On the right half of the map, at the right, vertically printed:

First state DE EVROPA (Fig. 589)

Second state DD EVROPA with a combination of the letters E and D in the second D (Fig. 590)

On the right half of the map, at the bottom of the map, a little to the right of the middle:

First state an empty area between two rivers (Fig. 591)

Second state a shaded upright mountain range instead of two rivers (Fig. 592)

Europe 5 three states

In the title of the map:

First state EVROPA (Fig. 593)

Second state ERVPA (Fig. 594)

Third state EVROPA with a combination of the letters V and E in the V and a combination of the letters O and V in the O (Fig. 595)

Just below the title of the map, just to the right of the middle:

First state DI IAZY with a vague contour of a D in between DI and IAZY and GENETAMASE (Fig. 593)

Second state DI IAZY with a clear D in between DI and IAZY and GEMETAMASE with a combination of the letters N and M in the letter N (Fig. 594)

Third state DI IAZY with a less clear D in between DI and IAZY and GEMETAMASE with a combination of the letters N and M in the letter N (Fig. 595)



Fig. 593



Fig. 594



Fig. 595

On the left half of the map, in the middle of the map:

First state	no non-shaded contour of the sea in the mainland (Fig. 596)
Second state	an additional non-shaded contour of the sea in the mainland (Fig. 597)
Third state	an additional non-shaded contour of the sea in the mainland (Fig. 598)

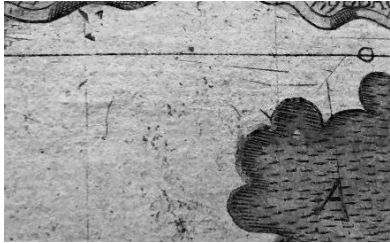


Fig. 596

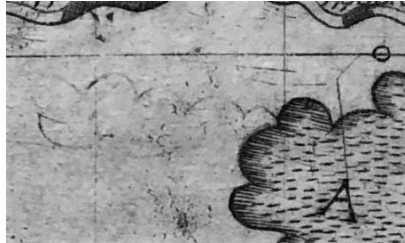


Fig. 597



Fig. 598

On the right half of the map, below LIBURNIA, just to the right of the middle:

First state	DELMINIO	ERONA	ALET	DVCLATE (Fig. 599)
Second state	DENLINIO	EORONA	ALETA	DVDEATE (Fig. 600)
Third state	DELMINIO	ERONA(NA)	ALETA	DVCLATE (Fig. 601)

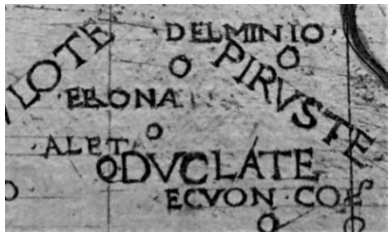


Fig. 599

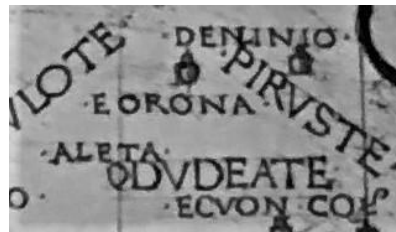


Fig. 600

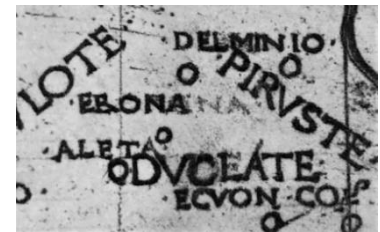


Fig. 601

Europe 6 two states

In the title of the map:

First state	EVROPA (Fig. 602)
Second state	EVROPA with a combination of the letters V and A in the letter V and a combination of the letters O and S in the letter O (Fig. 603)



Fig. 602

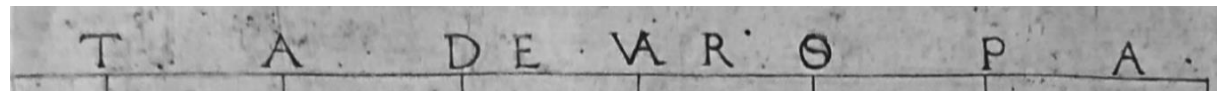


Fig. 603

On the left half of the map, more or less at the top of the map, in the area between the two rivers beneath VENETIA and above GALIA TOGATA:

First state	only the toponym ATRIA is present (Fig. 604)
Second state	below ATRIA and a bit to the right more toponyms are visible, some vaguely, other clearly (Fig. 605)

On the right half of the map, in the middle, below PELIGNI, at the coast line:

First state	SVLMO and ANXANO (Fig. 606)
Second state	SVLMO and ANXANO and below these toponyms a shadow of ANXAN with a clear O (Fig. 607)



Fig. 604



Fig. 605

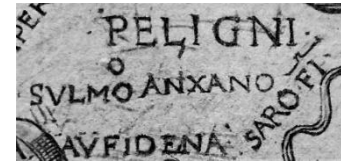


Fig. 606

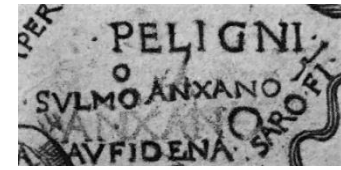


Fig. 607

Europe 6 modern two states

On the left half of the map, at the top of the map, just below the mountains and a bit left of the middle:

First state no toponym present between ZAG and ORCI (Fig. 608)

Second state BRESCIA present between ZAG and ORCI (Fig. 609)



Fig. 608



Fig. 609

Europe 7 two states

On the right half of the map, at the top on the isle SICILIA, left from and above the mountain ETNA MOE:

First state no name of the river vertically printed (Fig. 610)

Second state HELICON vertically printed (Fig. 611)



Fig. 610



Fig. 611

On the right half of the map, at the lower right corner of the isle SICILIA, below SYRACVSII:
 First state obliquely printed ORENO and vertically printed HISPERO (Fig. 612)
 Second state obliquely printed ORINO and vertically printed HISPORO (Fig. 613)



Fig. 612



Fig. 613

Europe 8 two states

On the left half of the map, at the top of the map, in the sea against the left margin of the map:
 First state no contours of a mountain present in the sea (Fig. 614)
 Second state the contours of a mountain present in the sea (Fig. 615)



Fig. 614

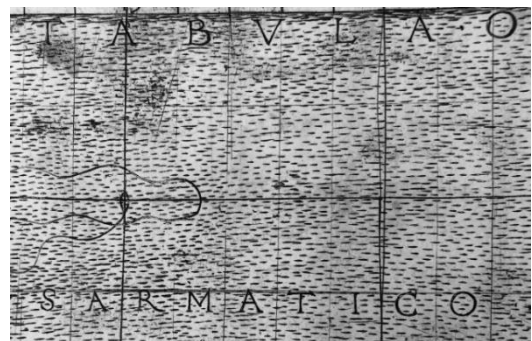


Fig. 615

On the left half of the map, just below the middle, a little to the right of the middle, above IAZYGE and below the mountains:

First state all toponyms clearly readable (Fig. 616)
 Second state some toponyms have been added and engraved over each other (Fig. 617)



Fig. 616



Fig. 617

Europe 9 three states

In the title of the map:

First state	ASIA (Fig. 618)
Second state	EVROPA (Fig. 619)
Third state	EVARSOPA (Fig. 620)



Fig. 618



Fig. 619

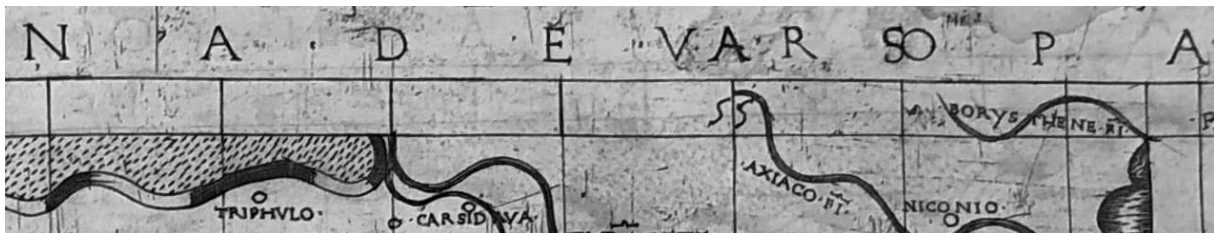


Fig. 620

On the right half of the map, just below the mountain range, near the sea:

First state	no extra letters above the obliquely printed VRB (Fig. 621)
Second state	no extra letters above the obliquely printed VRB (Fig. 622)
Third state	the letters VR are added above the obliquely printed VRB (Fig. 623)

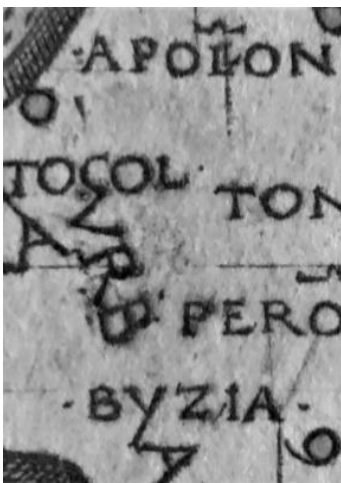


Fig. 621

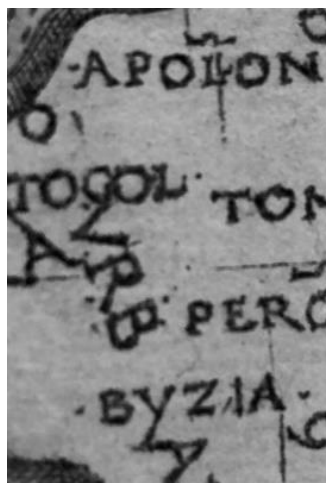


Fig. 622



Fig. 623

On the right half of the map, directly left from PAR DE ASIA PROPRIA:

- | | |
|--------------|--|
| First state | no contour of the sea present in the mainland (Fig. 624) |
| Second state | no contour of the sea present in the mainland (Fig. 625) |
| Third state | a non-shaded contour of the sea present in the mainland (Fig. 626) |



Fig. 624



Fig. 625



Fig. 626

Europe 10 two states

On the right half of the map, just above and to the left of the middle, in the sea near the coast:

- | | |
|--------------|--|
| First state | in between PELASGICO SENO and MALIACO SENO no island is visible (Fig. 627) |
| Second state | in between PELASGICO SENO and MALIACO SENO the shaded contour of an extra island is visible (Fig. 628) |



Fig. 627



Fig. 628

Africa 1 two states

On the left half of the map, between the two mountain ranges, toward the middle of the map:

- | | |
|--------------|---|
| First state | small mountain with the name GARAPHA MONE (Fig. 629) |
| Second state | other letters engraved over GARAPHA which makes it unreadable (Fig. 630) |
| First state | clean area below the mountain GARAPHA MONE (Fig. 629) |
| Second state | a c-shaped structure below the mountain GARAPHA MONE (Fig. 630) |
| First state | the toponym MACVR is printed correctly (Fig. 629) |
| Second state | the toponym MACVR is printed with a combination of the letters N and C in the C and the letters V and I in the V (Fig. 630) |

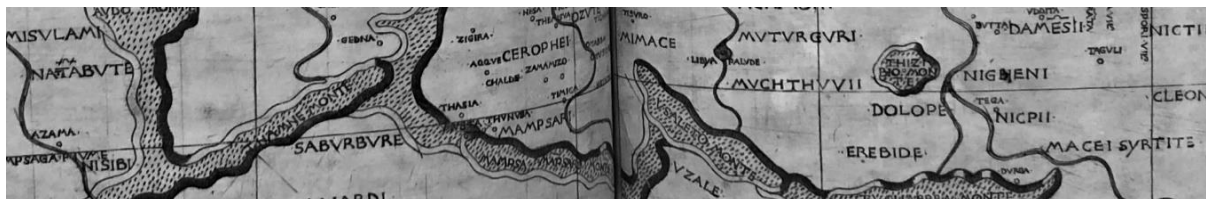


Fig. 629



Fig. 630

First state	APHRICA absent (Fig. 631)
Second state	APHRICA absent (Fig. 632)
Third state	APHRICA present (Fig. 633)



On the left half of the map, in the middle of the map, toward the middle of the map, just below the coastline and above ERTAG ENI, vertically printed:

MAXILLA

GO
PARTA.VO
MAXVLA
CH

GO
PARTA VOL
MAXVLA
CHI

On the left half of the map, in the lower left corner of the map, just left to the mountain range:

First state	NATABVTE with an accent above the T and a small T added between the A and T (Fig. 637)
Second state	NATTABVTE without accent and with a double large T (Fig. 638)
Third state	NATTABVTE without accent and with a double large T (Fig. 639)

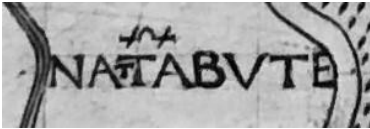


Fig. 637

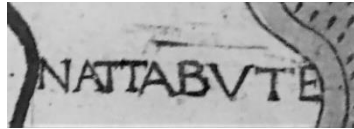


Fig. 638



Fig. 639

On the left half of the map, toward the middle of the map, just above the mountain range and above MAMPSARI:

- | | |
|--------------|---|
| First state | the toponym MVSTA is present to the left of THVNVBA (Fig. 640) |
| Second state | the toponym MVSTA is repositioned in between THVNVBA and MAMPSARI and the toponyms are relocated (Fig. 641) |
| Third state | the toponym MVSTA is repositioned in between THVNVBA and MAMPSARI and the toponyms are relocated (Fig. 642) |

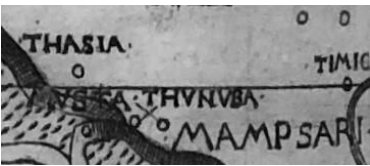


Fig. 640

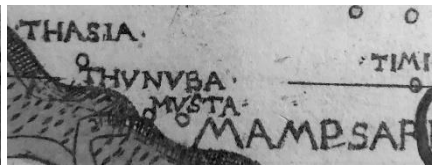


Fig. 641

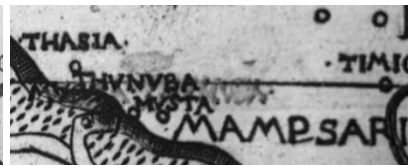


Fig. 642

Africa 3 two states

On the left half of the map, a bit to the left from the middle, below and a bit to the right of the island APHRODITE, vertically printed just below the coast line:

- | | |
|--------------|--|
| First state | NAVSTATHMO and ARCHILLA (Fig. 643) |
| Second state | NAVSTATHINO the letter M has turned into an I and a N and ARCHILLA is not readable anymore because letters have been added engraved over each other (Fig. 644) |

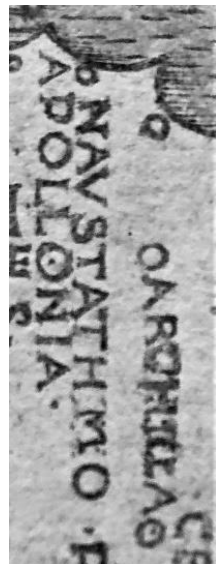


Fig. 643

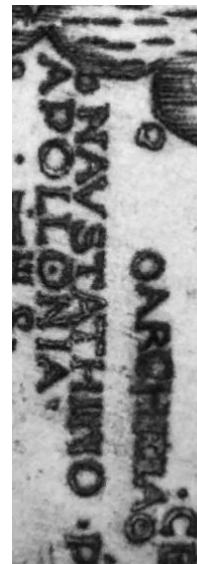


Fig. 644

Africa 4 two states

On the left half of the map, below the two mountains, a bit above the middle of the map and towards the middle of the map, obliquely printed:

First state the toponym SVBVRPYRE is printed correctly (Fig. 645)
 Second state the toponym SVBVRPYRE is printed with a combination of the letters Y and O in the letter Y (Fig. 646)



Fig. 645



Fig. 646

Asia 1 two states

In the title of the map:

First state the letter A of PRIMA printed correctly (Fig. 647)
 Second state the letter A of PRIMA printed with an oblique line protruding upwards and to the left above the second leg of the letter A (Fig. 648)

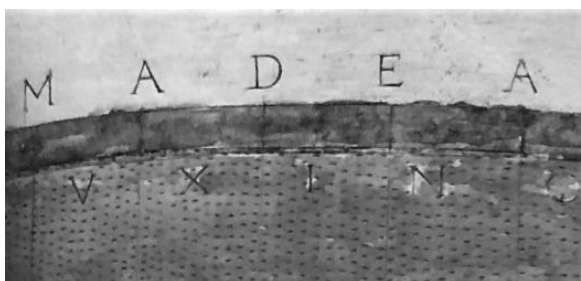


Fig. 647

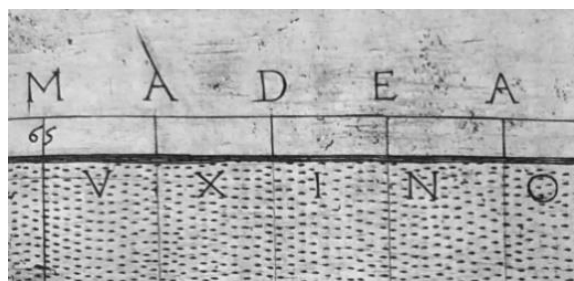


Fig. 648

On the left half of the map, a little above the middle and in the middle of the map, above THYNIA:

First state SANGARIO (Fig. 649)
 Second state the letters N and G of SANGARIO are not readable anymore and above these two letters a N and G have been added (Fig. 650)



Fig. 649



Fig. 650

On the right half of the map a bit to the left of the middle and somewhat below the coastline above POTO POLEMONIACO

First state GOZALINA (Fig. 651)
 Second state the letters L and I of GOZALINA are not readable anymore and above these two letters a L and I have been added (Fig. 652)

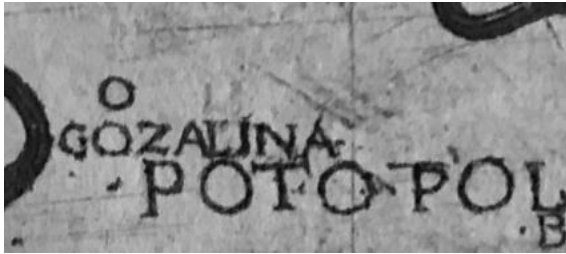


Fig. 651

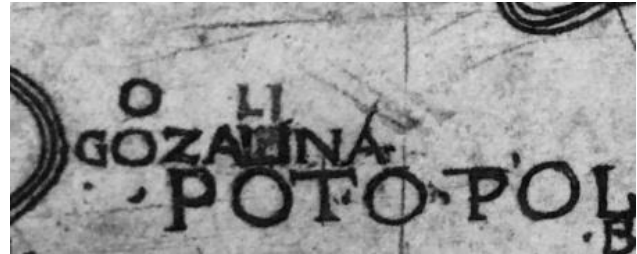


Fig. 652

Asia 2 three states

In the title of the map:

- | | |
|--------------|--|
| First state | the letter S of SECONDA is a S (Fig. 653) |
| Second state | the letter S of SECONDA is a combination of the letters S and D (Fig. 654) |
| Third state | the letter S of SECONDA is a combination of the letters S and D (Fig. 655) |

On the right half of the map, against the right border of the map, vertically printed:

- | | |
|--------------|---|
| First state | no letters present between SCYTHIA and DENTRO (Fig. 656) |
| Second state | a letter is partially present following SCYTHIA and in front of DENTRO the letters R and O are present (Fig. 657) |
| Third state | in between SCYTHIA and DENTRO the word DENTRO has been added (Fig. 658) |

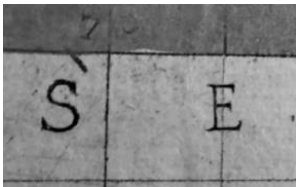


Fig. 653

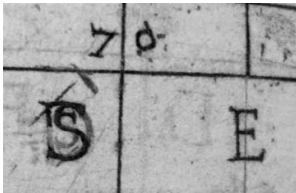


Fig. 654

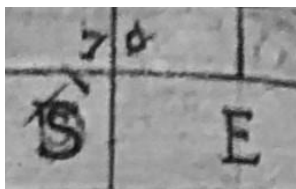


Fig. 655



Fig. 656



Fig. 657

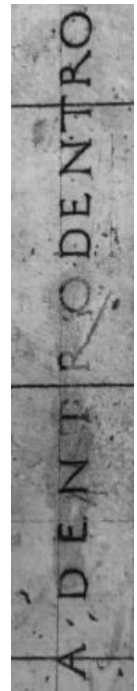


Fig. 658

Asia 3 three states

On the left half of the map, directly to the right of the mountain range, below the middle of the map and towards the middle of the map:

- | | |
|--------------|--|
| First state | ASTAVNITE (Fig. 659) |
| Second state | ASTAVMITE the N has become an M and a large L is printed over the M (Fig. 660) |
| Third state | ASTAVMITE the N has become an M with an additional line through the M instead of the letter L (Fig. 661) |

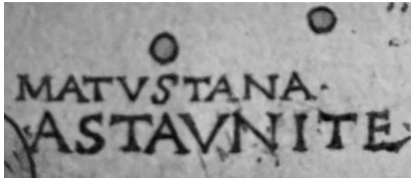


Fig. 659



Fig. 660



Fig. 661

On the left half of the map, just right to and below the circular mountain range:

- | | |
|--------------|--|
| First state | GORDENA (Fig. 662) |
| Second state | GORDENA with a combination of the letters E and A in the letter E (Fig. 663) |
| Third state | GORDENA with a combination of the letters E and A in the letter E (Fig. 664) |

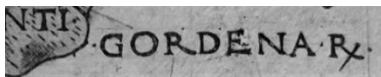


Fig. 662

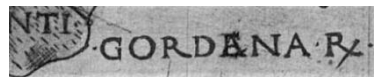


Fig. 663

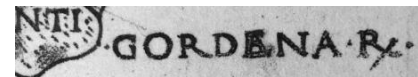


Fig. 664

Asia 4 two states

On the right half of the map, a bit above the middle and to the right of the middle of the map, above BABYLONIA:

- | | |
|--------------|--|
| First state | the names of the rivers are printed as ARSARE and REGIO (Fig. 665) |
| Second state | names have been added engraved over each other therefore the names of the rivers are not readable anymore (Fig. 666) |



Fig. 665

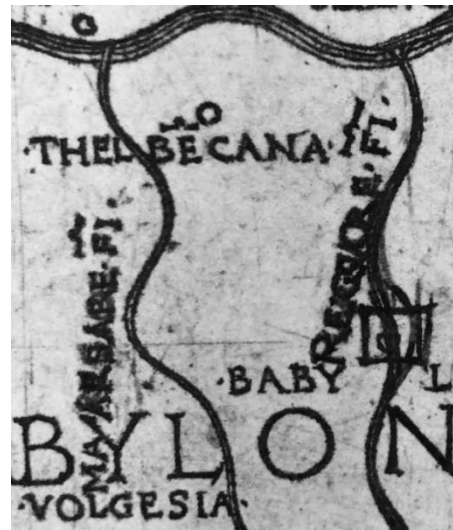


Fig. 666

Asia 4 modern only one state found

Asia 5 two states

On the left half of the map, a bit above the middle and toward the middle of the map, just below the mountain range:

- | | |
|--------------|---|
| First state | SAGARTII (Fig. 667) |
| Second state | SAGAREII with a combination of the letters T and E in the letter T (Fig. 668) |



Fig. 667



Fig. 668

Asia 6

two states

On the left half of the map, starting in the upper left corner and then at an angle of 45 degrees to the right and downwards, two characteristics:

First state PAR DE ARABIA PETREA and SARACENI (Fig. 669, 671)

Second state letters have been added and engraved over PETREA making it unreadable and SARACENI with a combination of the letters S and C in the S and an extra S added above the letter S (Fig. 670, 672)

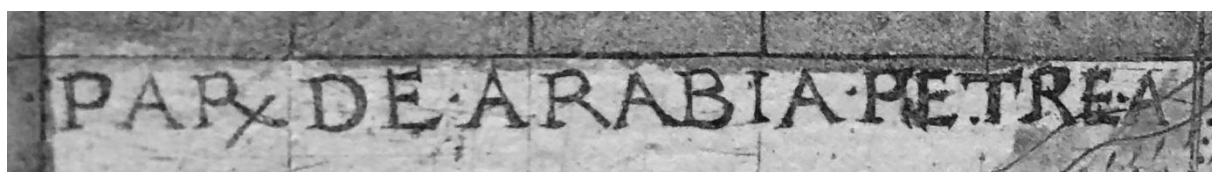


Fig. 669



Fig. 670

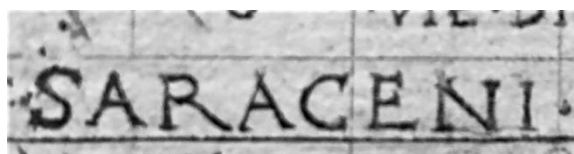


Fig. 671

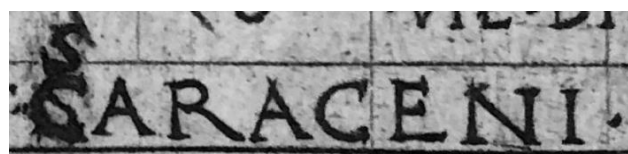


Fig. 672

On the left half of the map, in the middle of the map, just below the river:

First state SSYRNO (Fig. 673)

Second state letters have been added and engraved over the letters Y and R making it more or less unreadable (Fig. 674)

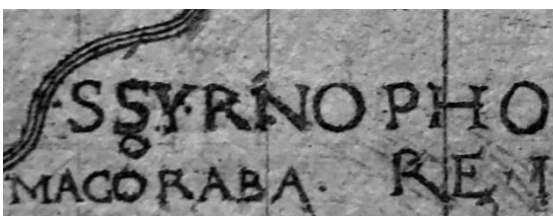


Fig. 673

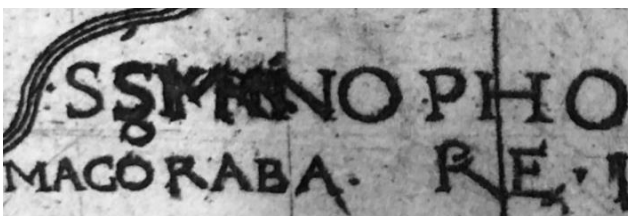


Fig. 674

Asia 7

three states

On the left half of the map, in the middle of the map, between the mountain range and the sea:

- First state CACHAGE SCYTHER (Fig. 675)
 Second state CACHAGE SCYTHER with a small additional letter C above the letter C of SCYTHER and a combination of the letters C and E in the letter C of SCYTHER (Fig. 676)
 Third state CACHAGE SCYTHER with a small additional letter C above the letter C of SCYTHER and a combination of the letters C and E in the letter C of SCYTHER (Fig. 677)

On the right half of the map, just left to the mountain range, at the right side of the map, vertically printed:

- First state TECTOSACE (Fig. 678)
 Second state TECTOSACE with a small additional letter C in between the letters C and T (Fig. 679)
 Third state TECTOSACE with a small additional letter C in between the letters C and T (Fig. 680)

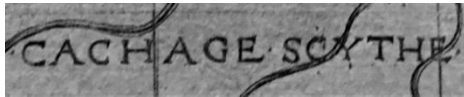


Fig. 675



Fig. 676



Fig. 677

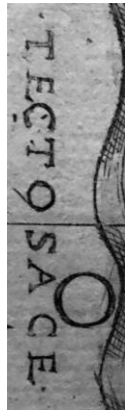


Fig. 678

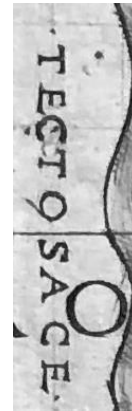


Fig. 679



Fig. 680

On the right half of the map, at the right border of the map, vertically printed:

- First state SCYTHIA (Fig. 681)
 Second state SCYTHIA and more or less a combination of the letters H and N in the letter H (Fig. 682)
 Third state SCYTHIA and more or less a combination of the letters H and N in the letter H (Fig. 683)

On the left and right half of the map:

- First state no traces of an imprint of a cleaning cloth (Fig. 675, 678, 681)
 Second state no traces of an imprint of a cleaning cloth (Fig. 676, 679, 682)
 Third state clearly present traces of a cleaning cloth (Fig. 677, 680, 683)

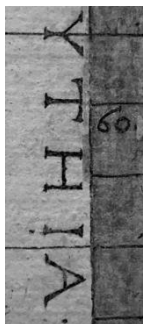


Fig. 681

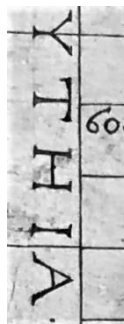


Fig. 682

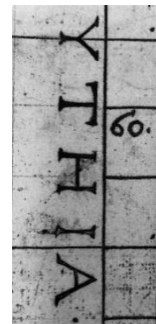


Fig. 683

Asia 8 only state; first edition first type maps show selective wiping or correction of the slip of the burin

Just below the middle of the map and a bit to the left:

First type the letters A of FORAD and M of IMAO printed correctly (Fig. 684)
 Second/Third type an oblique line connecting the A of FORAD and M of IMAO protruding a little under the M (Fig. 685)



Fig. 684



Fig. 685

Asia 9 two states

In the upper left corner of the map, a bit below and to the left of ARIA:

First state CHAVRINA (Fig. 686)
 Second state letters have been added and engraved over CHAVRINA making it more or less unreadable and above CHAVRINA additional letters are engraved HAVRI (Fig. 687)

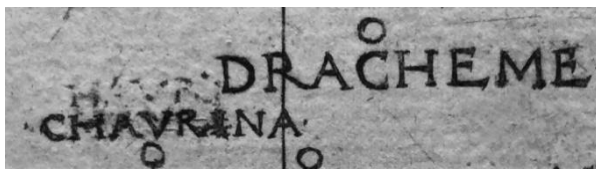


Fig. 686

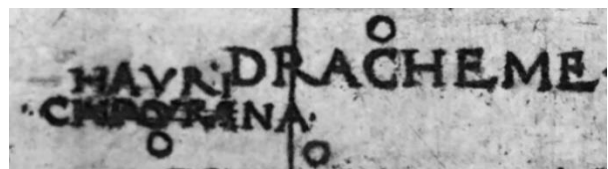


Fig. 687

Asia 10 two states

On the left half of the map, at the right side of the map, where the three rivers merge:

First state a single outline of the river above and below EMBOLIMA (Fig. 688)
 Second state a double outline of the river above and below EMBOLIMA (Fig. 689)



Fig. 688



Fig. 689

A bit lower and to the right, obliquely printed:

First state CASPIREI (Fig. 690)
 Second state CASPOREI the letter I seems to be an O because of a damaged copper plate (Fig. 691)

In the middle of the map, toward the middle of the map:

First state GONIDALI (Fig. 692)
 Second state GORIDALI with a combination of the letters N and R in the letter N (Fig. 693)



Fig. 690



Fig. 691

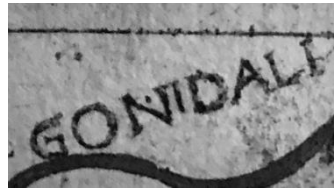


Fig. 692



Fig. 693

Asia 11 only one state found

Asia 12 three states

On the right half of the map, just to the right of the vertical mountain range, at the river:

First state GANGO with the letter E added above the letter O (Fig. 694)

Second state GANGE with the letter E still added but somewhat vaguely present now above the letter E (Fig. 695)

Third state GANGE with the letter E still added but somewhat vaguely present now above the letter E (Fig. 696)



Fig. 694



Fig. 695



Fig. 696

On the right half of the map, in the sea below the island:

First state INDICO MARE (Fig. 697)

Second state INDICO MARE (Fig. 698)

Third state INDICO MARE with a combination of the letters I and A in the second letter I (Fig. 699)

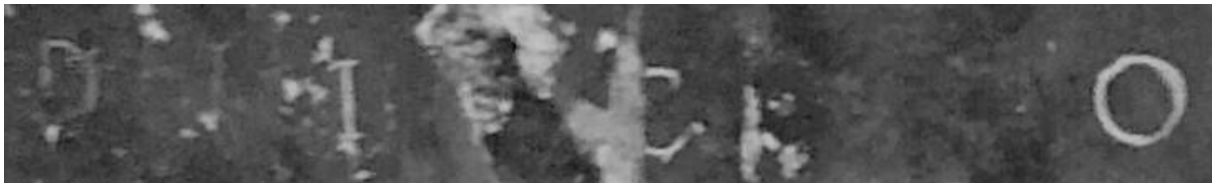


Fig. 697



Fig. 698



Fig. 699

The maps

Overview

After studying more than forty copies of Berlinghieri's *Geography*, three types of maps were distinguished. Since all the atlases have been re-bound, restored and sometimes completed over the centuries, different types of maps can be found together in one atlas. However, they can be distinguished by the way of production and by the time of printing with the help of the watermarks. In the following paragraphs, the distinguishing features are described. These can be helpful to identify anomalous specimens present in some copies, as well as individual maps. Table four gives an overview of the maps with the watermarks, the state of the map, and if applicable the backing of the maps with their watermarks found in the atlases studied. The atlases are presented group-wise per colour from left to right in a chronological order. The colour blue is used for atlases with predominantly the first type of maps, green is applied for those with mainly the second type of maps and the different shades of grey represent the atlases with the third type of maps printed by Giunti. Within each group of atlases an attempt has been made to display the order. For the first type of maps the order is based on the development in states, the watermarks, the colouring, and the backings. For the second type of maps, no specific order could be applied. They do not differ in state and the watermarks in the maps are predominantly the letter P and three mountains in a circle with a cross on top (Fig. 238-45).⁷⁶ These watermarks were found in varying numbers in the different atlases. For the third type of maps, belonging to the atlases with the title page in red, the order is based on the transition from second to third state of the map *TABVLA SECONDA DE ASIA*. The first atlases of this last type contain the watermarks hand with a star on top and anchor in a circle with a star on top, type 2 (Fig. 250-53).⁷⁷ In these atlases this map was consistently found in the second state. In the atlases at the right, compiled with maps with a large variation in watermarks, this map was found in the third state. Some maps in the atlases in between, with the watermark crescent in a circle with a cross on top or a crescent with a cross on top, showed the initial stage of the transition from second to third state (Fig. 254-59).⁷⁸ In the maps with these two watermarks, additional letters began to become visible ending in the full presence of the word *DENTRO* for the second time as described in the section about the states.⁷⁹ The colour orange is applied for the backings. The different states are represented in three colours: black for the first, red for the second and green for the third state. From top to bottom, the maps are displayed in the order according to the liber indication. The left and right sides of each map are both included to indicate in which half a watermark was found. The types of watermarks are shown in abbreviations including the subtypes in case that could be determined. In attachment one the abbreviations are linked to the full description of the watermark. Missing was applied in case a map was physically missing. The X in the column of the backing means that no backing was applied. The maps *TABVLA OCTAVA* and *NONA D ASIA* were printed from one copper plate. If they were printed on a single complete sheet of paper, only one of the two can contain a watermark. We emphasised this with the Giunti maps by applying NOW for the one without watermark. It could be reliably determined for the Giunti maps because they were not backed. It is additional evidence that shows that these two maps were engraved together on one copper plate and that the sheet of paper was cut in two after printing. To be able to understand this table properly, some issues need to be clarified. First and foremost, it must be made clear that the various copies were sometimes compiled with a variation of maps from different copies. In some cases, maps from a later edition or print run have been added to an earlier one. Probably to complete them in case of missing or damaged maps. Occasionally, a few of the earliest printed maps were detected in atlases with maps from a later print run or edition. Finally, we found indications of the use of spare paper during the second print run. Examples

⁷⁶ The watermark P: WZIS Referenznummer IT2670-PO-106411 Piccard online; Bernstein reference number ES-VLC-BH_INC.120_315_bis; The watermark three mountains in a circle with a cross on top: WZIS Referenznummer IT5235-PO-153390, Gerhard Piccard, *Wasserzeichen Dreieberg* (Stuttgart 1996), no. 1259.

⁷⁷ No reference was found for the watermark hand with a star on top. References of identical examples of the watermark anchor in a circle with a star on top are for type 2a: Bernstein reference number 14922, WZMA AT5000-GB56_1_398; type 2b: Bernstein reference number 14921, WZMA AT5000-GB56_1_391.

⁷⁸ For both watermarks no reference was found.

⁷⁹ This was specifically the case in the copies with the shelfmarks G.8173 and C.3.d.10 belonging to the British Library.

of these possibly misplaced or deviating maps will be discussed in chapter seven on the atlases. The different libraries and institutes were visited over a period of years. The differences in state were gradually discovered and understood. The photographed atlases and maps could be checked afterwards. The state of the maps of which no images were available were reassessed based on the knowledge obtained. At a later stage we discovered that due to an artefact, a third state could be assigned to the map *TABVLA SECONDA DE ASIA*. The exact moment of transition from second to third state of this specific map could not be determined. Therefore, a question mark is added to the state of this map in case the state could not be determined or reassessed with certainty.⁸⁰ A question mark is also applied for maps with a watermark that could not be determined, or in the event the type of watermark could be determined with probability, but not with certainty. The heavy colouring and backing are the reason that, in particular for a considerable number of first type maps, the watermark could not be found or determined. The table clearly shows that the maps in Berlinghieri's *Geography* must have been printed per atlas on demand in a certain number instead of per map in a predetermined quantity as found in the 1508 edition of the Rome *Cosmography*.⁸¹ This can be deduced from the watermarks. If the maps were printed in a certain edition, the same watermark, or a variation of it would always have been found. This was not the case in the *Geography*. The maps of the first and second type were mostly found backed with an additional sheet of paper. Table five gives an overview of the watermarks that were present in these backings. They will be addressed separately after describing the different types of maps.

The first type of maps

The first type was found in the richest illuminated atlases. Most of them were intended for or given to high-ranking persons of the time.⁸² In the most expensive and fanciful copies, the borders of the maps were gold plated and the seas and rivers were coloured solid dark blue with paint made from ground lapis lazuli. In less richly illuminated copies, the borders were painted in a gold or bronze coloured paint and for water a more aqueous blue colour was applied. The paper on which these maps were printed appeared thick and sturdy. This was caused by the fact that the maps were backed with a second sheet of paper. That could easily be detected. In some cases, the bonding did not adhere anymore, making the two sheets visible. In other cases, either the paper of the map was damaged, or the paper of the backing. The most unambiguous feature was the presence of a second watermark in the backing paper.⁸³ In almost all maps of the first type and their backings only one watermark was detected in the map and one in the backing. A complete sheet of royal paper must have been used for each map as well as each backing. Mostly, the watermark in the backing could be found and recognized better than the watermark in the paper of the map. The relief of the watermark in the backing paper and the shadow formed at certain lighting conditions made this possible. The watermarks in the paper of the maps were more difficult to detect because of the colouring. They were easier to find in those copies with a less opaque colouring. Besides the colouring, the fact that the maps were backed with a second sheet of paper made identification of the watermarks difficult. The discolouration to a yellow brown, caused by the bonding of the backing sheet made it even harder to find and recognise the watermarks. The watermarks found in the first type of maps mainly consisted of two variants of the shearer scissors and the cardinal's hat, type 1c and 1d (Fig. 222-25, 236-37).⁸⁴ The shearer scissors watermark is typical for the second half of the fifteenth century. In a copy in Amsterdam another variant of the cardinal's hat, type 5, was detected (Fig. 226).⁸⁵ This specific variant of the cardinal's hat watermark was also present in some maps of a copy

⁸⁰ The third state of this map appears to be present only on maps printed by Giunti during the third print run.

⁸¹ Op. cit. (n. 61), pp. 159-60.

⁸² In fact, the distribution of the presentation copies is a mirror of the political scene at the time.

⁸³ See figure 329-36 in chapter four on the paper and the watermarks.

⁸⁴ The watermark shearer scissors: WZIS Referenznummer DE5580-Codgraec71_VIII, Corpus Chartarum Fabriano reference number Z01234; Corpus Chartarum Fabriano reference number Z01235; The watermark cardinal's hat type 1c: WZIS Referenznummer DE4860-Ms1206_132; WZIS Referenznummer DE8100-PO-31975; WZIS Referenznummer DE8100-PO-31972; The watermark cardinal's hat type 1d: WZIS Referenznummer DE4860-Ms1206_112; Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 1, p. 224, no. 3387; Both types of the watermark cardinal's hat 1c and 1d were also found in the paper used for the edition of Dante's *La Divina Commedia* printed by Tedescho in 1481.

⁸⁵ Scheepvaartmuseum, shelfmark Me 0376. No reference was found for this watermark.

in Rome.⁸⁶ Some watermarks were found very rarely. In only one map the watermark lily in a circle was discovered (Fig. 232).⁸⁷ In two maps of another copy the watermark crossbow in a circle was found (Fig. 235). Both maps contained only one watermark which is characteristic for maps of the first type.⁸⁸ Because they were in the second state, we assume that they belong to the latest printed maps of the first type.⁸⁹ Regularly, the printed lines on the left and right half of the map ran continuously and straight from left to right. From this can be concluded that the maps were printed on a single complete sheet of paper. This was confirmed by the fact that the paper used for the first type of maps only contained one watermark in each map. From the first type of maps with discontinuous lines from left to right can be deduced that they must have been divided into two halves at some point. This may originally have taken place at the bookbinders, or perhaps many years or centuries later, when an atlas was re-bound. Three exceptions to the rule of one watermark in each map were found. In two maps, in both halves of the map, the watermark cardinal's hat was found.⁹⁰ In one map the watermarks cardinal's hat, type 1c, and the



Fig. 700

⁸⁶ Biblioteca Universitaria Alessandrina, shelfmark Inc.541, see table four.

⁸⁷ Biblioteca Nazionale Centrale di Roma, shelfmark 70.1.G.5; The watermark lily in a circle: Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 2, p. 400, no. 7312.

⁸⁸ The watermark crossbow in a circle: Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 1, p. 52, no. 746; WZIS Referenznummer DE8100-PO-123836 Piccard online; WZIS Referenznummer DE8100-PO-123837 Piccard online; Bernstein CCI reference number icpl.cci.XXVII.021.a.; Gerhard Piccard, *Wasserzeichen Werkzeug und Waffen* (Stuttgart 1980), no. 2234; Dieter Harlfinger, Johanna Harlfinger, *Wasserzeichen aus Griechischen Handschriften* (Berlin 1974), Armbrust 22; National Maritime Museum, shelfmark PBD 7690; *TABULA PRIMA DE EUROPA* and *TABULA SEPTIMA DE ASIA*; The photo shown in Fig. 235 is from a similar watermark present in the map *GALLIA NOVELLA*; Biblioteca del Seminario arcivescovile maggiore, shelfmark D III 56; This type of crossbow in a circle watermark can be dated between 1470 and 1500. Comparable variants of this crossbow in a circle watermark were found in the paper applied for another book printed by Tedesco: Landino, *Disputationes Camalduceses* (Florence before September 12, 1481).

⁸⁹ Table four and six.

⁹⁰ Biblioteca Nazionale Universitaria di Torino, shelfmark XV.I.42, *TABULA PRIMA DE LIBYA QVALE ET APHRICA*; National Maritime Museum, shelfmark PBD 7690, *TABULA PRIMA DE ASIA*.

shearer scissors were detected in the two halves of the map.⁹¹ Possibly, something went wrong during printing, backing or colouring of these maps. In that case, the failed half had to be replaced. If the maps had been printed in two halves as a rule, many more examples of maps with two watermarks per map would have had to be found. The colour of the ink on the first type of maps was more grey than black. Further, the ink was applied more cautiously compared to the other types of maps. One last striking feature of these maps was that the margins around the printed image were remarkably clean. The copper plates must have been wiped selectively clean in certain places before printing (Fig. 545-46). Where wiping was difficult to implement, for example in the titles, a filling agent like wax may have been applied. It is a good indication of the special care Tedesco must have taken of these impressions of the first type of maps. They were almost exclusively found in the special presentation copies. A specific example of this feature is the brushing off or the coverage with wax of the slip of the burin on the map *TABVLA OCTAVA D'ASIA*. At first, we mistook this feature as a state difference. The copper plate was not adjusted. Instead, the adaptation was achieved by cleaning or correcting the copper plate at that specific spot before printing. Comparable examples of this way of working were found on other maps of the first type. An example of a map of the first type is shown in figure 700 and a complete copy with maps of the first type can be studied on the internet.⁹² Based on the presence of a backing sheet, the watermarks and an early state, several uncoloured maps also belong to the first type.⁹³ Extremely rarely, even an uncoloured and unbacked map of the first type in the first state was found.

The second type of maps

The atlases containing the second type of maps were much less, or not at all illuminated. The maps were usually coloured. The type of colouring applied, was very different compared to the first type. It was much more economic, with less variation. The predominant colour on these maps was green which was applied to the sea. The colour of the mountains was yellow brown. Regularly grains of ground up bronze, bonded with a tempera-like medium, were found on the mountain ranges (Fig. 701). The applied colouring was less heavy and more translucent. That made the discovery and identification of the



Fig. 701

watermarks somewhat easier. Nevertheless, it remained difficult because these maps were again usually backed with a second sheet of paper. Only one watermark was detected in these backings. A complete sheet of royal paper must have been applied for the backing. Browning of the maps, caused by a discolouration of the bonding, was also found on this second type of maps. An example of a second type of map is shown in figure 702.

Uncoloured and partially coloured maps of the second type with and without backing have also been found.⁹⁴ The watermarks three mountains in a circle with a cross on top and the letter P were predominantly present in the second type of maps in several variants (Fig. 238-45). Additionally, variations of another cardinal's hat watermark, type 7, were found in a few maps of the second type and

⁹¹ Biblioteca Medicea Laurenziana, shelfmark Inc.I.5, *TABVLA TERTIA DI LIBYA*.

⁹² Florence Biblioteca dell'Accademia della Crusca, shelfmark Inc. 34:

<http://incunaboli.accademiadellacrusca.org/theke/schedaimmagine2.asp?es=o&radice=000189809>

⁹³ National Maritime Museum, shelfmark PBD 7690, all the maps in this copy were uncoloured.

⁹⁴ Biblioteca del Seminario arcivescovile maggiore, shelfmark D III 56, maps backed and uncoloured or partially coloured; British Library, shelfmark C.1.d.1, maps not backed and uncoloured or partially coloured; Biblioteca Nazionale Marciana, shelfmark Inc. 0037 and Biblioteca del Museo Correr, shelfmark Inc. D.013, maps all backed and uncoloured; Biblioteca Casanatense, shelfmark Vol.Inc.1110, maps not backed nor coloured.

in some copies only (Fig. 246-49).⁹⁵ Another important and distinguishing feature of the second type of map is the size of the paper. In many maps, in each half of the map, a watermark was found. That could be the same, or another variant of the same watermark. Often a combination of two of the three watermarks described above was detected in maps of the second type. This implies that two small or median sized sheets of paper were used to print a single map of the second type.⁹⁶ As a result, the image and the margins of the left and right side do not converge in the centre of a map and are often interrupted. A possible explanation for the use of a different and smaller size of paper for the printing of the second type of maps may have been a cost saving. Several different locations and orientations of the watermarks in the paper of the maps of the second type were observed. For example, the watermark P was usually found more towards the corner of the map. In the maps of some copies, the watermark was present in the middle at the bottom or top, or in the middle at the left or right side.⁹⁷ In these cases the chain lines ran horizontally instead of vertically. The paper must have been placed at an angle of 90 degrees to the copper plate before printing. Apparently, it could be applied in different directions. Thus, it can be concluded that the size of the paper must have been larger than half the size of the copper plate. The colour of the ink applied to print this second type of maps was more grey than black and comparable with the ink used for the first type of maps. In contrast with the first type of maps, the ink on these maps was not applied cautiously. The margins around the printed image were in most cases not clean. Mistakes and slips of the burin, as well as corrections on the copper plate were not wiped or corrected either.



Fig. 702

⁹⁵ The watermark cardinal's hat type 7: WZIS Referenznummer DE0960-Mtlf550_33; WZIS Referenznummer IT5235-PO-31970; Bernstein reference number CCI 58_3; WZIS Referenznummer IT1650-PO-31969; The watermark cardinal's hat type 7 was also detected in the book *Platonis Opera*, printed in 1484 in the Ripoli convent in Florence. It contained variants of this watermark as found in the *Geography*.

⁹⁶ Biblioteca Riccardiana, shelfmark SEDE.Ed.R.624; Biblioteca Casanatense, shelfmark Vol.Inc.1110; British Library, shelfmark C.1.d.1; in these three copies in almost every map two watermarks were found, one in each half.

⁹⁷ Copies showing this feature were found in the British Library, shelfmark C.1.d.1, and in the Biblioteca Casanatense, shelfmark Vol.Inc.1110.

The third type of maps

This type was in many ways completely different. In general, they were found in atlases with the title page printed in red and with the leaf with the register and colophon present. As already stated in chapter five on the text, this edition was printed by the Florentine printer Giunti. Most of the time these atlases were not illuminated, and the maps were uncoloured.⁹⁸ The maps in these copies made a completely different impression. First, the colour of the ink applied was dense black. Second, the pressure applied to print the maps must have been much higher, compared with the other two types of maps. This can be deduced from the fact that all the scratches present on the copper plates are depicted on this third type of maps. In some cases, the high pressure exerted even causes the map image to be printed through on the reverse side (Fig. 703-04). Further, the corrections made to the copper plates are clearly printed, as well as the slips of the burin where the engraver lost control. The last characteristic is the presence of a lot of plate tone on these maps. Often a dark margin was found around the printed image, with display of all the scratches and damages to the copper plate, as well as a print of the irregular edges of the copper plate (Fig. 506, 551). This effect was not limited to the margins around the printed image. Several maps

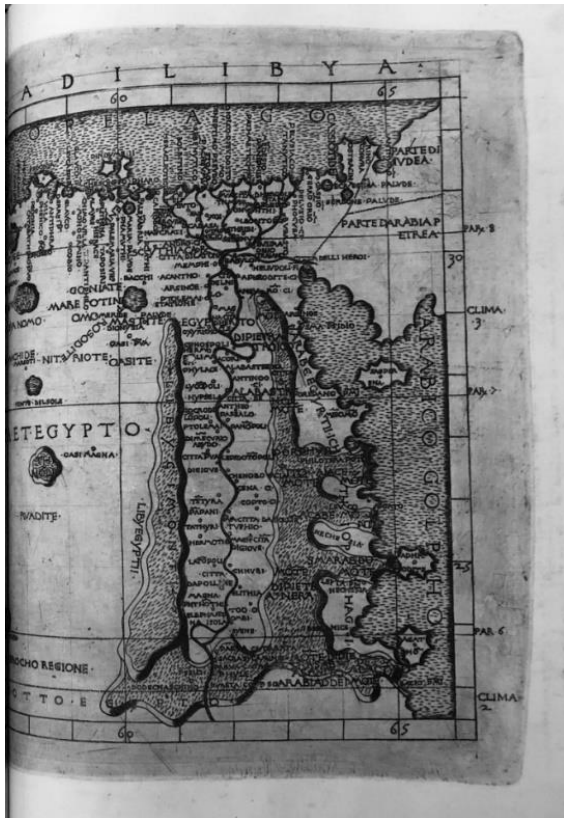


Fig. 703

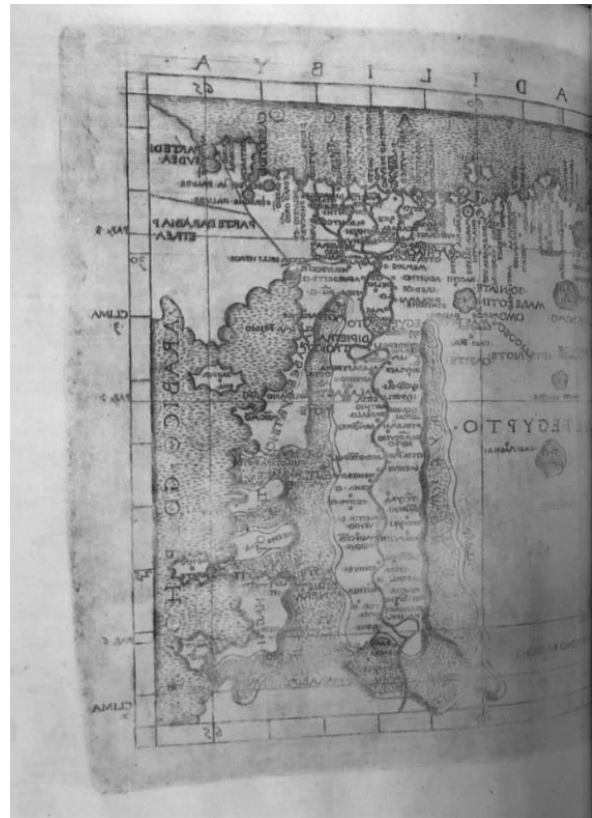


Fig. 704

contain quite empty regions. On this third type of maps these blank areas were also regularly covered with a lot of plate tone. In all, the many scratches and damages were displayed more clearly as compared to the first two types of maps. An example of the third type of map is shown in figure 705. The fact that all these tiny superficial scratches and details are still visible and not worn away in use, are a good indication that the copper plates had not yet been printed very often during the first and second phase of printing. Only a very small number of maps of the third type were found backed.⁹⁹ The watermarks

⁹⁸ We found only one coloured Giunti copy on the internet. Because of the high-resolution images in some maps the watermark crescent in a circle with a cross on top could be recognized. No statements about the colouring can be made as we did not study this copy in person; Bibliothèque nationale de France, shelfmark C 2035 9.

⁹⁹ Biblioteca dell'Accademia Nazionale dei Lincei e Corsiniana, shelfmark 51.G.1; Biblioteca Apostolica Vaticana, shelfmark Stamp.Barb.AAA.IV.15.

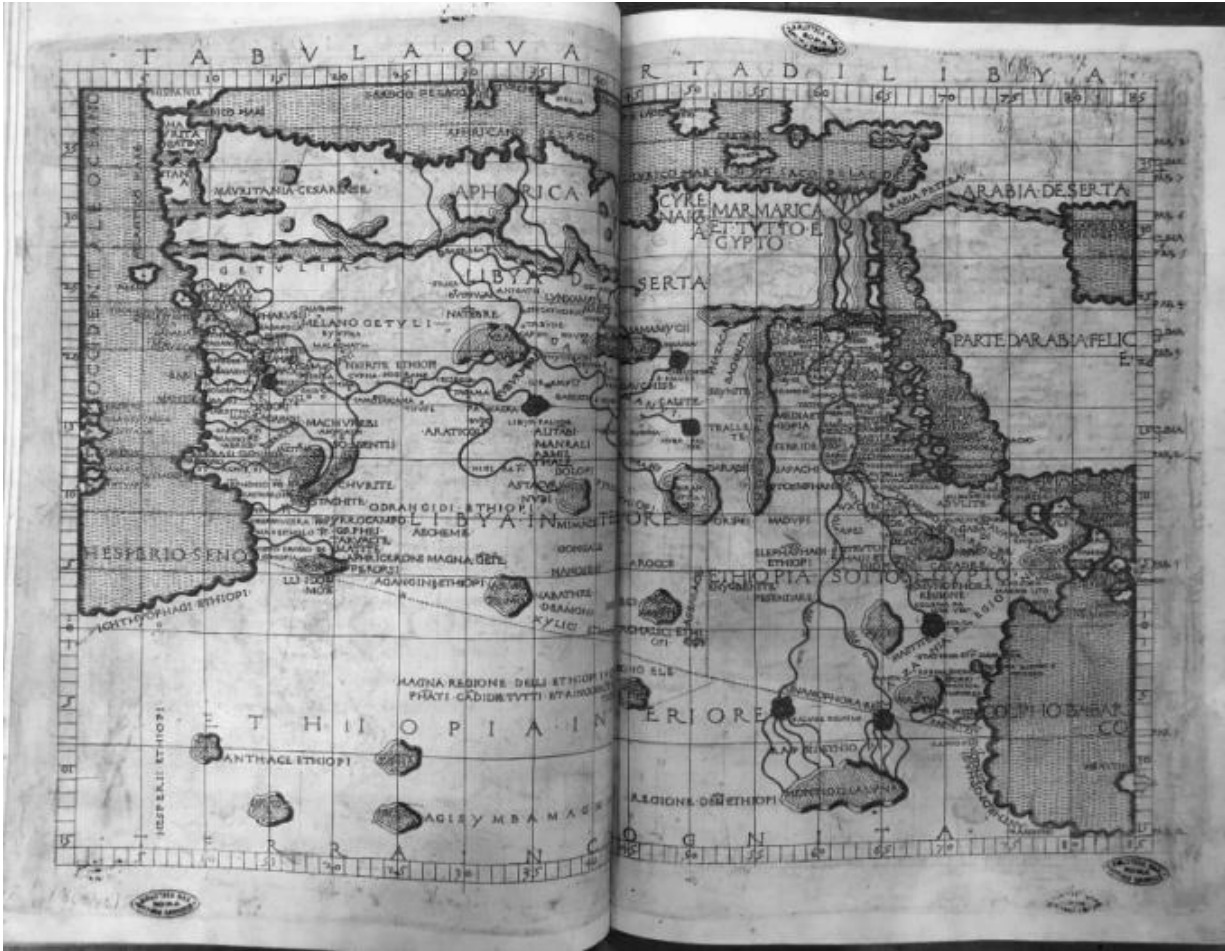


Fig. 705

present in the third type of maps include a hand with a star on top, an anchor in a circle with a star on top, type 2 and 3, a crescent with a cross on top, a crescent in a circle with a cross on top, an eagle in a circle, an anvil with a hammer in a circle, a boat, a ladder in a circle with a star on top, a crossbow in a circle, a crossbow in a circle with a lily on top, crossed arrows with a star on top, a ladder in a shield with a star on top, and crossed arrows in a circle with a star on top (Fig. 250-82).¹⁰⁰ In total, variations of thirteen different watermarks were detected in the paper used to print the third type of maps. An important characteristic is the presence of only one watermark in the paper of each map. So, only one sheet of royal paper was used to print a map of the third type. The only exception was paper with the

¹⁰⁰ The watermark anchor in a circle with a star on top type 2a: Bernstein reference number 14922, WZMA AT5000-GB56_1_398; type 2b Bernstein reference number 14921, WZMA AT5000-GB56_1_391; type 3: no reference found; The watermark anvil with a hammer in a circle: Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 2, p. 347, no. 5963; WZIS Referenznummer DE5580-Codgraec91_322; The watermark boat: Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 3, p. 601, no. 11963; The watermark crescent with a cross on top: no reference found; The watermark crescent in a circle with a cross on top: no reference found; The watermark crossbow in a circle type 4: no reference found; The watermark crossbow in a circle with a lily on top: WZIS Referenznummer DE5580-Musm1503aAltus_2; WZIS Referenznummer DE5580-Musms65_2; The watermark crossed arrows in a circle with a star on top: Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 2, p. 362, no. 6305; The watermark crossed arrows with a star on top: Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 2, p. 362, no. 6292; WZIS Referenznummer DE5580-Codgraec243_48; WZIS Referenznummer DE5580-Musms7_22; The watermark eagle in a circle: no reference found; The watermark hand with a star on top: no reference found; The watermark ladder in a circle with a star on top: Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 2, p. 345, no. 5922; The watermark ladder in a shield with a star on top: WZIS Referenznummer DE8100-HBII2_999; WZIS Referenznummer DE4620-PO-122767; WZIS Referenznummer AT8100-PO-122766; Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 2, p. 345, no. 5926 and 5927.

watermark hand with a star on top. In the paper of the maps with this watermark regularly two watermarks were found. These sheets may have been of small or median size. Table four shows that, based on the watermarks, three kinds of atlases have been found with this third type of maps. The first group of atlases, of which three have been studied, almost exclusively contained the watermarks hand with a star on top and an anchor in a circle with a star on top, type 2, both in two variants. It was striking that the watermark hand with a star on top in all three copies was found exclusively in the world map and the maps *TABVLA OCTAVA* and *NONA D ASIA*. Apparently, it was decided to use paper of a different size to print these specific maps. The size of these sheets must have been smaller, but larger than half the size of the paper used for the other maps. Probably, the reason was that the image on the engraved copper plates of these three maps was a bit larger than the image of the other maps. Obviously, it was not continued during the later print runs of maps of the third type. It explains why on many world maps the wind faces are partly trimmed. The same applies to the text related to the latitudes on the maps *TABVLA OCTAVA* and *NONA D ASIA*. Another explanation is that the paper may have been cut off during later restorations and rebinding. In only one map of these three copies another watermark, a crescent in a circle with a cross on top, was detected.¹⁰¹ The second kind of atlases with maps of the third type were characterized by the almost exclusive presence of the watermarks, crescent with a cross on top, and a crescent in a circle with a cross on top in all the maps. Three exceptions were discovered.¹⁰² In these maps the watermark anchor in a circle with a star on top, type 3, was found. This watermark forms the bridge to the next and last group of nine atlases. The third group of atlases contained a varied mix of all the other watermarks with exception of the watermark hand with a star on top. Several of these watermarks could be dated approximately 1525. The joint presence in various copies of watermarks that occur about 1525 makes it highly probable that these maps were printed around 1525. The first and second group of atlases with maps of the third type are related to the third group by the overlapping presence of watermarks. In Brussels we found a special copy.¹⁰³ Given the large variety and the type of watermarks found in the maps, in combination with the presence of the final state of the map *TABVLA SECONDA DE ASIA*, this atlas unmistakably belongs to the third and last group of maps printed by Giunti. Several watermarks that are characteristic of the first and second group of atlases printed by Giunti were present in this copy. The watermark an anchor in a circle with a star on top type 2a characteristic for the first group was detected once. The watermark a crescent with a cross on top was found twice, and a crescent in a circle with a cross on top watermark once. These belong to the second group. The watermark P was detected in 3 maps. This is even more remarkable as this watermark is characteristic for the second type of maps printed by Tedesco. Obviously, some leftover maps printed by Tedesco were added to this copy by Giunti.¹⁰⁴ The fact that maps from all three groups printed by Giunti were found together in one atlas, even in combination with maps printed by Tedesco, indicates that all three groups of maps must have been printed and processed by Giunti in immediate succession. If the maps had been printed by Giunti in different phases with time in between, the leftover maps printed by Tedesco would very likely have been processed with those of the first print run and not have been kept until the last. According to us, this copy shows that they were all printed one after the other and then incorporated into atlases. The order of these three groups is determined by the transition from the second to the third state of the map *TABVLA SECONDA DE ASIA* described earlier in this chapter. In the first group of atlases the erroneous presence of the word *DENTRO* in between *SCYTHIA* and *DENTRO* for the second time is invisible. In the second group the first letters appear only partially, while they are fully present in the third group of atlases. From the different sizes of paper that are used and from the watermarks, it can be deduced that the maps of the third type were printed by Giunti in three different print runs. The overlap of the different watermarks found in the maps of the third type seems to indicate that the three print runs will have been in rapid succession of each other. From the large number of watermarks found, it can be concluded that a considerable number of reams of paper were used up. The number of printed sets of maps by Giunti to supplement the available number of text copies must have been extensive. This is confirmed by the printing characteristics of these maps, as all minor scratches and plate irregularities have not yet worn

¹⁰¹ Biblioteca Nazionale Centrale di Roma, shelfmark 70.1.G.7.

¹⁰² See table four.

¹⁰³ De Koninklijke Bibliotheek van België, shelfmark Inc C 208.

¹⁰⁴ This will be further explained in chapter seven on the atlases.

away. It also implies that the number of impressions of the first and second type must have been very limited. In only two atlases with maps of the third type a backing was found. In a copy from the Vatican City only one map was backed.¹⁰⁵ The watermarks present in this map could not be distinguished. Neither was it possible to certainly determine which watermark belonged to the map and which one to the backing. In the copy studied in Rome the maps were backed in a peculiar way; the halves of consecutive maps were bonded together.¹⁰⁶ Where a map was preceded or followed by a leaf of text or interleaf, the map was bonded together with these leaves. Some maps in this atlas were backed as usual, with an additional sheet of paper. The watermark ladder (perhaps in a circle) with a star on top was present in this backing paper. Thus, in case maps of the third type were found backed, then they seem to have been backed with the same kind of paper as the maps themselves were printed on. In certain respects, the description of the three types of maps must be put into perspective. We have described that the first two types of maps are printed somewhat grey and with less plate tone compared to the third type of map which is printed rather black and with a lot of plate tone. This applies to the whole group of maps. On an individual map the degree of plate tone can vary. Maps of the first type can be found with more plate tone than described and maps of the third type with less. Printing in those days was a craft with varying results.

The backing of the maps

We are of the opinion that the maps of the first and second type were backed with a second sheet of paper as preparation for the colouring and illumination, particularly the presentation copies.¹⁰⁷ The maps will have been backed and coloured prior to binding. We have already described that we have found traces on some maps of flattening them with a smoothing stone (Fig. 531). The backing made the paper stiffer and more suitable for the - in some cases - very lavish colouring. It will also have helped to prevent the colours from bleeding through on the reverse side. When the paint had dried, the maps had to be put under a form of weight to flatten the wrinkled paper. The moisture still had to evaporate from the paper. The maps were backed with a complete sheet of royal sized paper. Probably this is the reason that paper with the watermarks P, three mountains in a circle with a cross on top, and the watermark cardinal's hat type 7 was not applied for the backing of the maps. The watermarks found in the paper the maps were backed with are presented for each map in table four and five. Their photos are shown in chapter four on the paper and the watermarks (Fig. 283-338). Five exceptions to the rule of one watermark in each backing were found. In three backings the watermark scissors were found twice (Fig. 284-85).¹⁰⁸ In one backing the watermark scissors was present in combination with a cardinal's hat and in another one the watermark shearer scissors was combined with the watermark cardinal's hat, type 8 (Fig. 300). Probably something went wrong during backing. In that case, the failed half had to be replaced. Logically, also two backings were found without a watermark.¹⁰⁹ Table five shows an overview per atlas of the watermarks found in the first and second type of maps and of those detected in the paper the maps were backed with. They are represented by blue, green, and orange balls respectively. The regular combination of the blue and orange balls is striking, whereas this is not the case for green and orange balls. In other words, the same watermarks were regularly found in the maps and the backing of the first type of maps, but this

¹⁰⁵ Biblioteca Apostolica Vaticana, shelfmark Stamp.Barb.AAA.IV.15.

¹⁰⁶ Biblioteca dell'Accademia Nazionale dei Lincei e Corsiniana, shelfmark 51.G.1; It was not possible to take good pictures of the watermarks in the backing. The ladder was always visible, the star sometimes and the circle could not be detected. In the maps this watermark was found with a circle.

¹⁰⁷ Backing of the maps is not uniquely applied to the maps of the *Geography*. The, also coloured, maps in a copy of the 1477 Bologna edition of the *Cosmography* in the Bayerische Staatsbibliothek in München, shelfmark Rar. 124, were found backed with a second sheet of paper as well.

¹⁰⁸ The watermark scissors: Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 2, p. 237, no. 3677; WZIS Referenznummer DE8100-PO-122406, Gerhard Piccard, *Werkzeug und Waffen* (Stuttgart 1980), no. 1314; Corpus Chartarum Fabriano reference number Z01217; Biblioteca Nazionale Universitaria di Torino, shelfmark XV.I.42, *TABVLA PRIMA DE LIBYA QVALE ET APHRICA*; Biblioteca Universitaria Alessandrina, shelfmark Inc.541, *TABVLA PRIMA DE LIBYA QVALE ET APHRICA*, *TABVLA QVARTA DI LIBYA*, *TABVLA SEXTA D EVROPA*, and *TABVLA VNDECIMA DE ASIA*.

¹⁰⁹ Biblioteca Nazionale Universitaria di Torino, shelfmark XV.I.42, *TABVLA SEPTIMA DE EVROPA*; Royal Geographical Society, shelfmark CA15F-001, *CAELESTEM HIC TERRAM INSPICIAS TERRESTRE OB CAELVM*, the world map; for these two maps it cannot be excluded that a watermark was present but not detected.

characteristic was not applicable to the second type of maps. This will be explained in more detail in the following paragraphs.

The first type of maps were backed and most of them were coloured. The watermarks applied in the backing of these maps were regularly found in several copies in varying combinations. Another notable feature is that the watermarks shearer scissors, the cardinal's hat, type 1c, 1d, 5, and 8, as well as the lily in a circle, type 1, were present in the paper used for the maps as well as for the backing of the first type of maps (Fig. 222-26, 231-32, 288-92, 300, 303-07).¹¹⁰ From the already described careful and selective wiping and cleaning of the copper plates it can be concluded that these maps were intended for special presentation copies. The presence of identical and nearly identical watermarks in the paper of these maps as well as in the backings indicates that the paper came from the same supplier or even a particular workshop or so called *cartolaio*. It also indicates that they must have been backed shortly after printing. The variety of watermarks found and the fact that some were rarely used are a further confirmation. The assumption that the maps were backed soon after they were printed can be substantiated with the help of a copy present in Turin.¹¹¹ This copy contains a letter from Berlinghieri dated May 31, 1484. Illumination, colouring of the maps, and transport to the consignee has probably taken more than a year.¹¹² Therefore, the backing of the maps present in this copy must have been executed almost instantly after printing them. This seemed to be the standard procedure for the earliest printed maps. The watermarks scissors, a crescent with rays and a cross on top, and a lily in a circle found in the backings of these maps will therefore safely date from 1482 or 1483 (Fig. 284-87, 303-07).¹¹³ The copy present in Amsterdam is linked to the copies mentioned above by the fact that almost all maps in this atlas were in the first state.¹¹⁴ Many maps in this copy contain the watermark cardinal's hat, type 5 (Fig. 226). It must have been one of the first atlases printed. Furthermore, in front of the maps *TABVLA OCTAVA* and *NONA D ASIA* an additional interleaf was added with the watermarks, lily in a circle, type 2, and crown in a circle (Fig. 220-21).¹¹⁵ The same were found in the backing of the maps in this copy (Fig. 308-09, 311-12). These extra interleaves were only found in the richest and most illuminated copies and added in a workshop as described earlier. In view of the above, one may assume that the maps of this copy were also backed soon after they were printed. This seemed to be the standard procedure for the earliest printed maps. It will be illustrated in more detail in the description of the copy held in the Alessandrina library in chapter seven on the atlases. Although we have no cross reference with other copies for the watermarks siren, crown in a circle, and lily in a circle, type 2b, found in the backing of the maps of this copy, we assume with reasonable certainty that they can be dated 1482 or 1483 also (Fig. 308-09, 311-14).¹¹⁶ The appearance of the same type of watermark in maps, the interleaves added at the workshop, and the backing of different copies, is a confirmation that the printing and the backing of the maps in these copies must have been applied in the same period. The next watermark found in the backing of maps of the first type is the crowned eagle, type 2, in a copy in Florence (Fig. 315).¹¹⁷ Based on the applied practice of backing maps of the first type, it should also be dated around 1483. A variant of this watermark, present in a copy with maps of the second type together with other watermarks that are

¹¹⁰ See table four and five. For the watermarks cardinal's hat, type 5 and 8 no reference was found.

¹¹¹ Biblioteca Nazionale Universitaria di Torino, shelfmark XV.L42.

¹¹² This is deduced from records found in archives about the copy described in the following article, Raphaele Tauci, 'La geografia del Berlinghieri della Biblioteca Alessandrina di Roma', *La Bibliofilia*, 69, (1967), pp. 69-73; Biblioteca Universitaria Alessandrina, shelfmark Inc.541

¹¹³ The watermark crescent with rays and a cross on top: WZIS Referenznummer DE5580-2Incca609_X; The watermark lily in a circle type 1 and 2: Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 2, p. 400, no. 7312; Corpus Chartarum Fabriano reference number Z01290; Gerhard Piccard, *Wasserzeichen Lilie* (Stuttgart 1983), no. 945; Corpus Chartarum Fabriano reference number Z01315; Gerhard Piccard, *Wasserzeichen Lilie* (Stuttgart 1983), no. 946; WZIS Referenznummer IT1650-PO-128715.

¹¹⁴ Scheepvaartmuseum, shelfmark Me 0376.

¹¹⁵ The watermark crown in a circle: Corpus Chartarum Fabriano reference number Z01131; Nikolai Petrovich Likhachev, *Likhachev's Watermarks* (Amsterdam 1994), nr. 401; Corpus Chartarum Fabriano reference number Z01166, Z01167, and Z01278.

¹¹⁶ The watermark siren: no reference was found.

¹¹⁷ The watermark crowned eagle, type 2 and 3: Corpus Chartarum Fabriano reference number Z01148, Z01241, and Z01245; Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 1, p. 24, no. 82; WIES reference number IBE 2527.06; Gravel reference number 4555; Dieter Harlfinger, Johanna Harlfinger, *Wasserzeichen aus Griechischen Handschriften* (Berlin 1974), Adler 21; Biblioteca Nazionale Centrale di Firenze, shelfmark Magl. Inc. N_20.

easier to date, will be discussed further on. The last watermarks detected in the backing of maps of the first type are a crescent, a column, and the cardinal's hats, type 1c and 6j, in a copy in London (Fig. 288-89, 297, 317, 323).¹¹⁸ The watermark cardinal's hat 1c was already in use in 1481 and 1482.¹¹⁹ The crescent watermark was found in a database dated 1483. For the column watermark references of closely related watermarks around 1470 were found. The watermark cardinal's hat, type 6j, was also present in the backing of maps of the second type and will be discussed there.¹²⁰ A small lily watermark was found in the backing of just one map in a private collection (Fig. 310). It is a little difficult to recognise because it is superimposed with the watermark cardinal's hat type 5 in the paper of the map. A reference of a closely related watermark from around 1473 was found in Briquet.¹²¹

The maps of the second type mostly have different watermarks in the backing sheets in relation to the maps. With a few exceptions, there were no matches with the watermarks present in the backings of the first type of maps (table five). This might indicate that the second type of maps were backed in different workshops or at different moments, either or both. Two copies with maps of the second type in the Vatican City and Milan contained the same three types of watermarks in the backing of the maps.¹²² The shearer scissors watermark was identified in both atlases. It was exactly the same as found in the paper of the first type of maps, and the paper of a few text pages. In the copy of the Vatican City the watermark a cardinal's hat, type 1, and in the atlas in Milan a cardinal's hat, type 9, was present (Fig. 283, 288-91, 301).¹²³ The third corresponding watermark concerned the watermark crowned eagle, type 3 (Fig. 316). The wings and the tail resembled each other. Alas, the heads of the eagles could not be compared very well. They seemed to be the same, but this could not be confirmed with certainty. In the copy in Milan additionally a watermark ladder was detected in the backing of several maps (Fig. 325-26). References for this watermark dated 1483 were found in a database.¹²⁴ The ladder watermark was further present in a book printed by Tedescho somewhat earlier.¹²⁵ The shearer scissors watermark and the watermark cardinal's hat, type 1, are the watermarks found in the earliest printed maps. Their presence in the paper used to back the maps of these atlases suggests that the backings were affixed directly or shortly after the maps were printed. Together with the cross reference regarding the crowned eagle, type 2, found in the backing of a first type of map mentioned somewhat earlier, this implies that the other watermarks in the backing of these copies probably also date from about 1483. The watermark tulip, in the backing of the maps of a copy in Florence, is sharply dated 1483 by Briquet (Fig. 327).¹²⁶ The type of watermark Greek cross in a circle, present in the backing of a map in another copy in Florence, was also found in the paper of books printed by Tedescho in 1482 and 1483 (Fig. 322).¹²⁷ The watermark anchor in a circle with a star on top, type 1, was much more generally detected in the backing of the maps in this atlas (Fig. 319).¹²⁸ That watermark is notoriously difficult to date, as it has been in use for a very long time and in many variations, but without a real evolution to its appearance. We did not find a reference of exactly this type of anchor in a circle with a star on top in any database. The watermark Greek cross in

¹¹⁸ The watermark crescent; WZIS Referenznummer DE8100-PO-41373 and 41374 Piccard online; The watermark column: Corpus Chartarum Fabriano reference number Z01096 and Z01098; WZIS Referenznummer DE8100-PO-100191, Gerhard Piccard, *Die Turmwasserzeichen* (Stuttgart 1970), no. 245; Dieter Harlfinger, Johanna Harlfinger, *Wasserzeichen aus Griechischen Handschriften* (Berlin 1974), Säule 21; National Maritime Museum, shelfmark PBD 7690.

¹¹⁹ Dante Alighieri, *La Divina commedia* (Florence 1481) and Berlinghieri, *Geography* (Florence 1482).

¹²⁰ Op. cit. (n. 13), pp. 315-16; The cardinal's hat type 6j, was exactly the same one as present in many maps in copies of the 1490 edition of the Rome *Cosmography*. The same applies to the watermark crown in a circle found in the Amsterdam copy, described in a previous paragraph.

¹²¹ Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 2, p. 385, no. 6882.

¹²² Biblioteca Apostolica Vaticana, shelfmark Inc.S.120; Biblioteca Nazionale Braidense Milano, shelfmark AK.XVI.13.

¹²³ The watermark cardinal's hat, type 9: no reference was found.

¹²⁴ The watermark ladder: Corpus Chartarum Fabriano reference number Z01236 and Z01237.

¹²⁵ Landino, *Disputationes Camalducenses* (Florence before September 12, 1481).

¹²⁶ The watermark tulip: Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 2, p. 377, no. 6657; Biblioteca del Seminario arcivescovile maggiore, shelfmark D III 56.

¹²⁷ The watermark Greek cross in a circle: WZIS Referenznummer IT6780-PO-125776, Gerhard Piccard, *Wasserzeichen Kreuz* (Stuttgart 1981), no. 986; Biblioteca Marucelliana, shelfmark R.A.788; Cherubino da Siena, *Regola della vita spirituale* (Florence 1482); Cherubino da Siena, *Regola della vita spirituale* (Florence 1483); The watermark Greek cross in a circle was also present in Ficino's edition of the works of Plato printed in the printing office of the Ripoli convent in Florence, in 1484.

¹²⁸ The watermark anchor in a circle with a star on top, type 1: no reference was found.

a circle sequentially connects to the paper used to print the maps of this copy.¹²⁹ We believe that it is therefore valid to date both watermarks around 1483. The most common watermarks in the copy in Lucca are crossed keys in a circle in two variations, one with a cross on top and the other without (Fig. 320-21). We have not found further information or references concerning this mark. The Lucca copy also contained a small crescent watermark in the backing of some maps (Fig. 323). This identical mark was found in the backings of a copy in London and in Venice.¹³⁰ In the Venetian copy a variant of this crescent watermark was detected in the backings (Fig. 324). The reference suggests a date around 1483, which can then also be applied to the crossed keys watermarks in the copy in Lucca. The presence of several variants of the watermark cardinal's hat, type 6 in the backing of the maps of the Venetian copy are an additional confirmation regarding this dating. The last type of watermark found in the backing of the map *TABVLA DECIMA DE EVROPA* in this copy in Venice concerns the watermark a ladder in a shield with a star on top (Fig. 328). This sheet of paper differed greatly from the rest of the paper in this heavily restored copy. We therefore assume that it is a restoration from another era. In the backing of the maps of a second copy in Venice, only a variant of the watermark cardinal's hat was present but so poorly discernible that it cannot be further interpreted.¹³¹ In a copy in the national library of Florence with predominantly maps of the first type some maps probably were added of the second type based on the detected watermark, the different size of the paper, and the deviating green type of colouring.¹³² In the backing of these maps a watermark anchor in a circle was present of which we found no references (Fig. 318). Lastly, in another copy in the Riccardiana library in Florence all maps were backed with paper with different variants of the watermark cardinal's hat, type 6.¹³³ Type 6j was identical to the one found in the just mentioned backing of a map in an atlas in London.¹³⁴ Another variant of this watermark in the backing, type 6i, is nearly identical to the watermark, type 6a, in the map, *HISPANIA NOVELLA*, as well



Fig. 706



Fig. 707



Fig. 708



Fig. 709

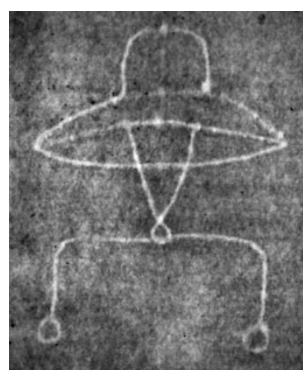


Fig. 710

¹²⁹ Biblioteca Marucelliana, shelfmark R.A.788.

¹³⁰ Biblioteca Statale di Lucca, shelfmark Inc.214; National Maritime Museum, shelfmark PBD 7690; Biblioteca del Museo Correr, shelfmark Inc. D.013.

¹³¹ Biblioteca Nazionale Marciana, shelfmark Inc. 0037.

¹³² Biblioteca Nazionale Centrale di Firenze, shelfmark Magl. Inc. N_20.

¹³³ Biblioteca Riccardiana, shelfmark SEDE.Ed.R.624.

¹³⁴ National Maritime Museum, shelfmark PBD 7690; In the backing of maps from this copy, the watermarks crescent and cardinal's hat type 1c are also present. They can be dated around 1482/1483; The watermark cardinal's hat, type 6j was further found in the maps of many copies of the 1490 Rome *Cosmography* edition (Fig. 707), op. cit. (n. 13), pp. 315-16.

as to the watermark type 6f in an interleaf from a copy in the Vatican Library.¹³⁵ This strong resemblance of different variants of this watermark cardinal's hat, type 6, in an interleaf, map, and backing in several copies of Berlinghieri's *Geography* strongly suggests that this paper must have been in use around 1483 (Fig. 213-14, 227-30, 293-99, 706-10).¹³⁶

In summary, there seem to be strong indications that the second type of maps were also backed soon or directly after printing. Cross-connections between the different copies concerning the paper used to back the maps with were found almost completely. The fact that a large variety of watermarks was discovered in these backings with less overlap between the various atlases compared to the first type of maps indicates that the maps went to different and possibly a greater number of workshops. Furthermore, the maps of the second type were printed shortly after the first type of maps and may therefore also have been processed somewhat later. This may also have contributed to the fact that several other watermarks were found in the backing of the second type of maps. The existence of uncoloured, unbacked copies of the second type of maps is an indication that Berlinghieri's *Geography* was not a commercial success. In fact, this is confirmed by the reissue of incomplete unsold copies by Giunti in the sixteenth century with the addition of the title printed in red, the third type of maps printed to complete the remaining sets of text, and the addition of the leaf with the register and colophon, the so-called second edition. As a rule, these maps are not backed although in two copies with maps of the third type some form of backing was found as described earlier in this chapter.

The chronology of the states

Now that we are familiar with the different states and types of maps, we can begin to complete the chronology. Table six displays the chronology of the states. This is a customized version of table four. We have included certain maps and their state selectively in this table to clearly show the development over time and the transitions from one state to another. The states in table six are represented by a number indicating the state of the map, preceded by the watermark found in the paper of that specific map.¹³⁷ For each state a different colour is applied for visual support. In the column of the copy from London are a few yellow fields with the capital P. This concerns the three proofs found in this atlas as described earlier.

The emphasis in table six is on the first type of maps. The reason is that all state changes, with exception of the two artefacts, were executed during and by the end of printing of the first type of maps. The order in which the atlases are displayed is chosen by us and based on a combination of the development in states, the watermarks, and for whom the atlases were intended. The first six copies are extensively illuminated and were destined for high-ranking people in the following order: Lorenzo de Medici, Cem, son of Sultan Mehmed II, Christoforo di Giustinopoli, Generale dell' Ordine dei Servi di Maria, the Pucci family, Cardinal Altemps, and the king of Naples.¹³⁸ These copies will have been amongst the first ones printed. An additional motive for this order is the fact that the same watermarks in a variety of interrelated compositions were found in the backing of the maps of the first five atlases in this table (table four and five).¹³⁹ Table six further shows that, with exception of the differences in state based on artefacts, all maps must have reached their final state at the end of the first phase of printing the first

¹³⁵ Biblioteca Apostolica Vaticana, shelfmark Stamp.Ferr.S.37.

¹³⁶ In chapter four on the paper and the watermarks stronger resembling photos of variants of the cardinal's hat type 6 in fly-leaves, interleaves, maps and their backing are shown.

¹³⁷ Only those maps of which the state and the watermark could be determined are shown in this table. The only exception is the map *TABVLA TERTIA D ASIA* from the copy in Naples; Biblioteca Nazionale Vittorio Emanuele III, shelfmark S.Q.X.K.15. We did not study this copy in person but have received images of the maps. Therefore, the watermark present in this map is not known to us. Nevertheless, the map was included because it was the only example of this map in the second state. The maps *PALESTINA MODERNA ET TERRA SANCTA* and *TABVLA VNDECIMA DE ASIA* are not included in the table because no adjustments or changes were detected on these maps.

¹³⁸ Roberts, op. cit. (n. 5), *Cartography between cultures: Francesco Berlinghieri's Geographia of 1482*, p. 134; According to Roberts this example lacks its first folios probably including the stemma or devices of its owner. Ferdinand I, King of Naples and Sicily and Alfonso II of Naples are both lauded by Berlinghieri in the *Geography*. Both may have been the intended recipient.

¹³⁹ The first four atlases were studied in person. We received images from the watermarks present in the backing of the maps of the copy from Naples and were informed that in some maps a cardinal's hat watermark was detected. We do not know which type because we did not receive images of the cardinal's hat watermark in the maps.

type of maps. This can be deduced from the fact that the second type of maps were always found in the same and final state. The copy of the Bibliotheca Casanatense was selected for the second type of maps because the maps were not coloured nor backed which made the identification of the watermarks in almost each half of the maps possible.¹⁴⁰ The copper plates were not intentionally modified anymore during the second printing phase. The state of maps of the second type was always as listed in the green-coloured column in table six.¹⁴¹ The third type of maps is represented in the Giunti column. These maps were printed during the third phase of printing in the early sixteenth century. During this phase, the copper plates were not intentionally modified anymore. The state of the map *TABVLA SECONDA DE ASIA* changed due to an artefact as already described. It is not exactly clear at which moment the state of the map *TABVLA SEPTIMA DE ASIA* changed by the corrosion. In any case, the feature was visible on all maps of the third type and also found on one map of the second type. Therefore, we assume the accident has taken place at the end of the second printing phase of maps.

The adjustments for the maps *TABVLA QVINTA*, *SEPTIMA* and *NONA D* or *DE EVROPA*, *TABVLA DI LIBYA SECONDA* and *TABVLA DVODECIMA D ASIA*, seem to have been made at a very early stage during printing.¹⁴² The state of the maps found in the atlas of the National Maritime Museum suggests that, eventually, all maps of the first type were subject to modifications. In this atlas many first type of maps were found in the final state. That implies that for many maps the final adjustments must have been made already during the first print run and prior to the second print run. The watermark shearer scissors was the only watermark detected in the proofs and the earliest printed maps, and regularly found in maps of the first type. In total we detected this watermark in the paper of about thirty maps. This fact, together with the rapid development of the state of some of the maps, strongly indicates that the adjustments must have been applied in a short time and in rapid succession. It is therefore quite possible that the adjustments of the copper plates were executed on site in Tedescho's printing office. If the proofs had been printed months earlier or in a different printing office, then there would have been a very good chance that other watermarks were found in the paper. The corrections seem to be related to the two manuscripts of the *Geographia*. It is not inconceivable that the manuscripts and copper plates were all present together in Tedescho's printing office. That may have been more practical than moving the copper plates back and forth from the engraver to the printer.

Integration and interpretation of the findings; the bigger picture

In a previous chapter, the development of the text pages and the printing order was described. In this chapter, the existence of three types of maps was explained. Skelton wrote that it is not known when the maps were engraved, corrected, and printed. He assumed that it would be plausible that the maps were ready before the text was written. So, before June 1481, or maybe even earlier, and at least before the Ulm edition of Ptolemy was completed on July 12, 1482.¹⁴³ In the following paragraphs, we will integrate the findings described in this chapter and explain what can be derived from them, *inter alia*, when the maps have been printed.

Two editions

As a rule, the first and second type of maps were found in atlases without the title page printed in red and without the presence of the leaf with the register and colophon. The watermarks found in these two types of maps clearly belong to the fifteenth century. Therefore, we concluded that these first two types of maps both belong to the so-called first edition printed by Tedescho. Because of the different characteristics found in the maps of the first and second type, the maps belonging to the first edition must have been printed in two different phases or print runs. The watermarks present in the third type

¹⁴⁰ Biblioteca Casanatense, shelfmark Vol.Inc.1110.

¹⁴¹ The only example with the corrosion detected on a second type of map was found in the copy Biblioteca Apostolica Vaticana, shelfmark Inc.S.120. This concerns the third state of this map, only present on one half of the map.

¹⁴² A note of caution is necessary here. Although the maps were printed one after the other more or less as a set per atlas, it cannot be excluded that a certain map ended up in another set or atlas. This may somewhat distort the perception and order that emerges from table six.

¹⁴³ Op. cit. (n. 22), p. XI.

of maps can be dated without doubt to the sixteenth century, approximately between 1516 and 1533 and more specifically between 1520 and 1525.¹⁴⁴ The maps of this so-called second edition were printed by the Giunti printing office. This edition is further characterized by the title page printed in red and the presence of the leaf with the register and colophon. Based on the watermarks, the maps belonging to this second edition must have been printed in different print runs. We cannot state with certainty that these have taken place consecutively or with interruptions. But, based on the dates ascribed to the different types of watermarks in the relevant literature as well as on the unique compilation of the copy in Brussels, this will probably have taken place in close or even immediate succession.

What happened during the break halfway Liber Secundus?

The order in which the text pages of the *Geography* have been printed is explained in detail in chapter five on the text. In the following paragraphs we want to make clear what happened during the break halfway Liber Secundus. Again, the watermarks are very important for this, as the course of events could be deduced from the paper consumption. It is not customary to stop printing a book midway. There must have been a major reason, for example an illness or a lack of funds. However, no evidence for an illness of Tedescho was found. With Berlinghieri as a client, lack of money will not have been an issue either. We are convinced that the arrival of the engraved copper plates with the maps must have been the decisive factor. This will have been important or urgent enough to interrupt the printing of the text pages. The availability of the copper plates about March 1482 is plausible if the engraving of the copper plates started after Berlinghieri's return from Mantua at the end of 1480 and given the time needed for engraving the maps as described earlier in this chapter. There are several indications for our conviction. The first one concerns the watermark shearer scissors, found in the paper applied for the proof prints and the first printed maps in about thirty maps only. This watermark was subsequently discovered in the paper used to print some pages of the gazetteer of Liber Secundus belonging to the second half of text pages printed after the interruption halfway this Liber (Fig. 195, 236-37).¹⁴⁵ This makes sense when these maps were printed following the printing of the first half of the text pages and before the printing of the second half. It is based on the chronology of the watermarks found in the paper used. Clearly, some sheets of paper used to print the maps of the first type, were depleted to print these specific text pages. This is the firm proof that the second half of the text pages must have been printed following the first type of maps. This is supported by the fact that the shearer scissors watermark was also found in one half of a map of the second type with the watermark three mountains in a circle with a cross on top in the other half.¹⁴⁶ The maps of the second type were printed after the second half of the text pages as will be explained in the next paragraphs. In addition, the first type of maps mainly contained the watermark cardinal's hat type 1, in two variants, c and d. Paper with the watermark cardinal's hat type 1c and d was frequently present in the second half of the text pages printed after the break halfway Liber Secundus. The watermark cardinal's hat type 1c and d was also found in the backing of the first type of maps. The same applies for the watermarks cardinals hat type 5, 6 and 8, shearer scissors and lily in a circle type 1. They were detected in the paper used for the maps of the first type as well as in paper applied for the backings. The similarities between the watermarks present in the paper of this first type of maps with the watermarks in the paper used for the backings points toward a specific workshop or *cartolaio* as paper supplier as was customary at the time and described in chapter five on the text. It indicates that the paper for the first type of maps and their backing must have been applied in the same period and must have come from the same supplier. In those days, a lot of workshops were present in Florence who devoted themselves to colouring and illuminating manuscripts and, in this case, the maps of the *Geography*. The large variety of watermarks found in the first type of maps in small numbers, sometimes only in a single map, shows that it must have been acquired in small amounts and from different paper stocks as can be

¹⁴⁴ Pettas, op. cit. (n. 7), pp. 55, 61, 65-72; Attachment one, overview of the watermark references found in databases.

¹⁴⁵ Biblioteca dell'Accademia Nazionale dei Lincei e Corsiniana, shelfmark 51.G.1; Biblioteca Apostolica Vaticana, shelfmark Inc.S.120; Biblioteca Apostolica Vaticana, shelfmark Stamp.Ferr.S.37; The watermark shearer scissors, was detected in each of these three atlases. It was present in the paper used for the gazetteer of Liber Secundus which was printed after the break and only once in each copy.

¹⁴⁶ This map will be described in chapter seven on the atlases; British Library, shelfmark C.1.d.1.

found in a *cartolaio* rather than from a paper manufacturer. The watermark cardinal's hat type 2 and 3 was not detected at all in the paper applied for the maps. On the contrary it was only occasionally found in some leaves with text belonging to the second half of the text printed after the break. Apparently, it was used as spare paper during the printing of this second half of the text pages, comparable to some left over paper from the printing of Ficino's edition of *La Divina Commedia* that was applied as spare paper during the printing of the first half of the text pages. Possibly because it had already been cut into two halves. This is already described and explained in chapter five on the text. The above is the physical evidence for the break halfway Liber Secundus. Earlier in this chapter we have described that Tedescho was obliged to build an intaglio printing press of large dimensions to be able to print the large copper plates. He must have been eager to start the printing of the maps as soon as they were available to him. Reason enough to interrupt the printing of the text. The presence of the shearer scissors watermark in proofs, early prints, as well as later states in only about thirty maps in total in our study indicates that this development must have taken place rapidly and on the site. In the case that the proofs had been printed months earlier or at a different location or printing office, then very probably other watermarks should have been found in the paper. The rapid development from proofs to the final state of each map described in the section about the chronology of the states emphasizes the above once more.

Chronology

Now that we have clarified the reason for the break halfway Liber Secundus and shown that during the break the first type of maps were printed, we will continue with discussing the different printing phases of the maps. But first we want to clarify when these took place and in what numbers the maps were printed in each phase. In chapter five on the text, it is shown that the printing of the *Geography* must have started after the printing of Dante's *La Divina Commedia*, at the earliest in September 1481. The printing must have been completed before Federico's death on September 10, 1482. Possibly, a little earlier because if his imminent death were known there might have been another dedicatee. The printing probably did not end much earlier since the last pages of the *Geography* were printed with type 111 R^a that was used for the first time, as described by Skelton, in the edition of the book *Regola della vita spirituale* published on October 22, 1482.¹⁴⁷ From attachment two it appears that the printing of the 1483 edition of this book took about one month. The printing of the 1482 edition must therefore have been started shortly after the death of Federico. It is unlikely that the new type 111 R^a will have been available much earlier. Therefore, we conclude that the *Geography* must have been printed between September 1481 and approximately September 1482. In those days, people worked 6 days a week. That means that a maximum of about 300 working days was available to print it. In chapter five on the text is described that it took 245 days to print the text. In the Gesamtkatalog Wiegendrucke and Conway's thesis we found two *oratio*'s printed by Tedescho in the same period.¹⁴⁸ We estimate that each of these took at least three working days leaving 49 days for the printing of the maps. According to Woodward the printing of thirty maps from copper plates took about a day.¹⁴⁹ We have already described that Tedescho had to print the largest copper plates known to date. Additionally, they were wiped clean locally before printing. So, the question is whether the pace described by Woodward could be achieved by Tedescho. We also know that at this stage, the copper plates were still adjusted according to the states. That must have taken time too. It is also known that pamphlets and leaflets were sometimes printed in between, jobs that might only take a day.¹⁵⁰ Finally, holidays, sick leave and downtime due to repairs must also be taken into account. We therefore think that 30-40 sets of maps may have been printed in this first printing phase rather than 49. This corresponds to a local market for a book of about 25-40 copies as described by Pettas.¹⁵¹ However, these first copies were not intended for the local market but for high-ranking persons of the time, partly and possibly donated to some of them for political or

¹⁴⁷ Op. cit. (n. 22), p. VI.

¹⁴⁸ Conway, op. cit. (n. 48), pp. 305-14.

¹⁴⁹ Op. cit. (n. 11), p. 597.

¹⁵⁰ Ross King, *The bookseller of Florence* (Amsterdam 2021), pp. 366-67, 392-93; Conway, op. cit. (n. 48), pp. 305-14.

¹⁵¹ Op. cit. (n. 7), p. 138.

diplomatic reasons and partly bought by others because of the importance of having this work in the collection.

In table four nine copies with predominantly first type of maps are presented and two more with several first type of maps. A copy in Barcelona found on the internet also contained the first type of maps and we know that copies in Paris (Matthias Corvinus King of Hungary), Arezzo (Roberto Malatesta and Elisabetta da Montefeltro), and Istanbul (Bayezid) contain illuminated maps of the first type. We cannot exclude the possibility that more copies with the first type of map can be found in libraries not visited by us. The more so as these maps were often illuminated and ended up in important libraries where they were well preserved. In any case, we have reliably found about fifteen atlases with the first type of maps. The occurrence of these maps not bound in an atlas, but as individual map must be extremely rare. To conclude, only two reams of paper were needed if 30 sets of maps of the first type were printed. The relatively large diversity of watermarks in small numbers found in maps of the first type as described earlier in this chapter can therefore only be explained when sheets of paper were acquired in small numbers from different reams of paper. This confirms the purchase of paper in a *cartolaio* and not from a paper manufacturer.

Given the information in the previous paragraph the second type of maps were printed in a separate print run somewhat later. Maps could be printed from the copper plates at any time as needed. That was just as efficient as printing them in a large number right from the start. Text pages, on the other hand, would have to be typeset anew, which was just as labour-intensive as printing them in a large print run. They were therefore immediately printed in the desired number of copies. Conway described in her dissertation what was printed in the various printing offices in Florence in those years, as far as is known.¹⁵² In attachment two the first book printed by Tedescho following the *Regola della vita spirituale* published on October 22, 1482, is the book *Rudamenta grammatices* published on April 16, 1483. It contains approximately double the number of pages. We therefore estimate the time needed to print it to be two months. In between only an *oratio* was printed. Given the time gap in the schedule, according to us the second type of maps were printed in this period. Using the same arguments as in the previous section, this results in a maximum of about 72 to 84 working days or printed sets of maps of the second type. This means that 8.5-10 reams of paper were needed as each of these maps were printed on two sheets of paper of a smaller size. Given the busy schedule in the following months and years, it is unlikely that Tedescho will have printed any more maps at a later point in time. This is confirmed by the watermarks. The maps printed during the second print run as a rule are printed on paper with the watermarks P, three mountains in a circle with a cross on top, and several variants of the watermark cardinal's hat type 7. Variants of the watermark cardinal's hat type 7 were present in other books printed by Tedescho during the second half of 1483 (attachment three). No trace of the three watermarks in the maps of the second type has been found in the text pages nor in the maps of the first type. On the contrary, the reverse does occur. Watermarks found in the text pages and maps of the first type were present in one half of some maps of the second type. All this strongly suggests that the maps of the second type must have been printed in this period and after completion of the printing of the complete text as well as the maps of the first type. Unfortunately, we did not find the watermarks P and three mountains in a circle with a cross on top in any other book studied. We also did not find any useful references in watermark databases about these two watermarks. Nevertheless, there are enough proofs to substantiate the above and in case maps would have been printed in later years other watermarks would have to be found. To conclude, in total around one hundred sets of maps of the first and second type must have been printed.

The third type of maps were printed by Giunti. From the large variation in watermarks and the large numbers in which they were found in the studied atlases, it can be concluded that a substantial number of sets of maps must have been printed by his printing office. This is confirmed by the fact that the impressions by Giunti are characterised by the presence of all kinds of small scratches and engraving characteristics that should already have been worn away if the copper plates had been printed many times. We assume that the print run of the text pages amounts to 500 copies. To complete the already and approximately 100 printed sets of maps of the first and second type, Giunti must have printed about

¹⁵² Conway, op. cit. (n. 48), pp. 305-14.

400 additional sets of maps. This matches with the many watermarks found in large numbers in the paper of this third type of maps. According to Veneziani the fonts for the title page in red were in use from 1516 on.¹⁵³ He is of the opinion that this page must have been printed around 1520. Pettas described that the Giunti firm printed books like the *Geography* between 1516 and 1533.¹⁵⁴ The references we found in databases of watermarks present in the paper of the maps printed by Giunti point to a date about 1525. We have not studied any other books printed by Giunti with an accurate dating. Therefore, we cannot further specify the period or year(s) in which he printed these third type of maps but somewhere between 1520 and 1525 is very plausible.

The first printing phase of maps

The chronological development of the states of the maps and the variation in the type of watermarks found in the maps of the first type support a print on demand approach. In case the maps would have been printed consecutively to the intended number, as was the case with the 1508 Rome *Cosmography* edition, the same watermark would more consistently have had to be found in each map.¹⁵⁵ From the rapid development in states of some maps, one can deduce that the maps must have been printed as individual sets of maps per atlas. This cannot be explained in any other way. However, the findings also indicate that during further processing and assembling the maps into an atlas, they sometimes got mixed up a bit.¹⁵⁶ Woodward described that it took about twenty minutes to ink a plate of about two thousand square centimeters. When only one intaglio printing press was available, as was the case in Tedescho's office, it is difficult to imagine that more than about thirty impressions of this size could be made in one day.¹⁵⁷ This means that about one set of maps per day could be printed. Initially only a small number of copies was printed and finished, intended for high-ranking people. This can be deduced from the great attention paid to the printing of these maps as described earlier. The selective wiping and corrections of the copper plates, and the checking and adjusting of them must have been a very laborious task. Combined with the extremely large dimensions it really must have been a Herculean challenge.

Apparently, these maps were nearly all backed. It implies that they were meant to be coloured. Uncoloured, unbacked impressions were found very rarely. They may have been spare examples to be used in case something went wrong during the backing or colouring process. Some copies, for example those presented to Cem and Bayezid, must have been backed, coloured, and illuminated directly or shortly after they were printed. This can be deduced from the date on the letter present in Cem's copy and a very comparable but undated letter in Bayezid's copy.¹⁵⁸ It is plausible that the same applies to the printed copies intended for Federico d'Urbino and Lorenzo de Medici, although no documented proof was found.¹⁵⁹ However, it cannot be excluded that colouring has also been applied some years later. It may even have been executed in the same workshop and by the same artists as earlier coloured and illuminated copies. It is impossible to determine exactly when the colouring or illumination was applied without further indication or evidence about a date. The atlas present in the Alessandrina Library is an example with proof of later applied colouring.¹⁶⁰ Notes were found in the archives of a monastery about the artist and the payment of, amongst others, the artist, the atlas, the colouring, and the cover in 1486, as well as Berlinghieri's personal involvement.¹⁶¹ The paper used for the backing of the maps of this copy partly contained the same watermarks as the copy destined for Cem, the son of sultan Mehmed II, as well as other early dedication copies. From this must be deduced that Berlinghieri had the first type of maps

¹⁵³ Paolo Veneziani, 'Vicende tipografiche della *Geografia* di Francesco Berlinghieri', *La Bibliofilia*, 84, (1982), pp. 206-07.

¹⁵⁴ Op. cit. (n. 7), pp. 55, 61, 65-72.

¹⁵⁵ Op. cit. (n. 61), pp. 159-60.

¹⁵⁶ Two examples are the following copies: National Maritime Museum, shelfmark PBD 7690, with proof impressions and maps of the first type in the final state together in this copy; Biblioteca Marucelliana, shelfmark R.A.788, with maps of the first and second type, based on the watermarks and the states, together in this copy with the same green colouring.

¹⁵⁷ Op. cit. (n. 11), p. 597.

¹⁵⁸ Biblioteca Nazionale Universitaria di Torino, shelfmark XV.I.42; Topkapı Sarayı Müzesi Müdürlüğü, shelfmark G.I.84.

¹⁵⁹ Maria Gabriela, Nico Paolini, *Gli incunaboli della Biblioteca della città di Arezzo* (Milan 1989), p. 141; Biblioteca Medicea Laurenziana, shelfmark Inc.I.5.

¹⁶⁰ Biblioteca Universitaria Alessandrina, shelfmark Inc.541.

¹⁶¹ Tauci, op. cit. (n. 112), pp. 69-73.

backed directly following printing. He kept them in stock for illumination, colouring, and further processing into an atlas in case of interest later, as described above. In the event that further processing of the book would have been left to the discretion of the buyer, much more variation would have to have been found in the watermarks in the backing, as well as in the applied colouring, illumination, and the composition of the copies with the additional interleaves in front of the maps *TABVLA OCTAVA* and *NONA D ASIA*.

The second printing phase of maps

Based on the states, the second type of maps must have been printed after the first type of maps. This is confirmed by the watermarks present in the paper used for these maps. No trace at all of paper used to print the second type of maps was found in the text pages, nor in the paper used for the first type of maps. Another indication that the first and second type of maps were printed separately and at a different moment, is related to the handling of the copper plates. The margins of the copper plates of the first type of maps were carefully wiped clean before they were printed. These maps were only used and found in the most richly illuminated and coloured atlases. This careful way of working was not applied to the maps of the second type during the second phase of printing. For example, all the mistakes and corrections in the titles of some maps are visible on this second type of map and not adjusted in some way as was applied to the first type of maps. Obviously, the printing of the text pages and the first type of maps already must have been completed before the maps of the second type were printed. This will be further explained in the next paragraphs. During the second printing phase of the maps, new and different stocks of paper were applied. The watermarks present in this paper were only found in the second type of maps. These were mainly the watermarks P and three mountains in a circle with a cross on top. The size of this paper was half the size of the paper used to print the first type of maps. This means that two leaves of paper were needed to print one map. Costs may have been the reason to apply the paper with this smaller format during the second printing phase as it was considerably cheaper. In only a very small number of the second type of maps variants of the watermark cardinal's hat, type 7, were detected. These were also found in some other books printed by Tedesco: *Horae Beatae Mariae Virginis* from July 5, 1483, and *Moralia in Job* from June 15, 1486, of which the printing began as early as 1483.¹⁶² This also indicates that the printing of the second type of maps of the first edition took place at the end of 1482 and the beginning of 1483, after the printing of the text and the maps of the first type was completed. Although the maps were printed on two separate leaves, Tedesco must have managed somehow to keep these halves together. In view of the small number of atlases printed during this second phase, this must not have been a problem. Seldom, differences in printing quality were found between the two halves of the maps. This indicates again that the maps were printed on demand per atlas, rather than in a large print run. In figure 711 an example of a map is shown with the watermark P in the right and the watermark three mountains in a circle with a cross on top in the left half of the map. Clearly, two different leaves of paper were used to print each half of the map. Nevertheless, the print characteristics suggest that these two halves belong together. Probably an inked copper plate was run through the press with two leaves of paper at once. This would account for the identical printing quality of both halves. Another feature detected that supports that the maps were printed per atlas is the consistent presence of faint impressions in a copy in the Vatican City.¹⁶³ Ink was made anew every day. If something went wrong, the result had to be found in everything printed with the supply of ink prepared for that day, as is the case in the maps of this copy (Fig. 503, 529). In contrast with the maps in the *Geography*, very regularly clear differences related to printing quality on both halves of maps of the Rome *Cosmography* editions were found. These were all printed on two halves of paper in large print runs and assembled into maps later.¹⁶⁴

¹⁶² Roberto Ridolfi, 'Le ultime imprese tipografiche di Niccolò Tedesco', *La Bibliofilia*, 68 (1966), p. 148; *Horae Beatae Mariae Virginis ad usum Ecclesiae Romanae*, (Florence 1483), Biblioteca Riccardiana, shelfmark Ed.R.726; Gregor I Papst, *Moralia in Job*, (Florence 1486), Biblioteca Riccardiana shelfmark Ed.R.60-61; Ridolfi describes that the book was meant to be published in 1484. The financing was supported by an investor. It must therefore be assumed that the paper must have been acquired in 1483 at the start of the project. This is confirmed by our observations of the watermarks found in the paper of this book.

¹⁶³ Biblioteca Apostolica Vaticana, shelfmark Stamp.Ferr.S.37.

¹⁶⁴ Op. cit. (n. 13), pp. 324-25; McGuirk Jr., op. cit. (n. 44), p. 133.



Fig. 712

Based on the watermarks, traces of paper used to print the first type of maps were very rarely detected in maps or atlases with maps of the second type, probably only in case a spare or leftover leaf was used during the second printing phase of the maps. In case it is a map in the first state, it must be a surviving example of a first type of map that ended up in an atlas with maps of the second type (Fig. 712). If it concerns a map in a later state but with a watermark belonging to the first type of maps, it may also be a leftover sheet of paper that was only processed during the second printing phase. For example, the shearer scissors watermark was found in one half of a map of the second type with the watermark three mountains in a circle with a cross on top in the other half.¹⁶⁷

Now that everything has been clarified regarding the different types of maps, the watermarks, and the printing phases the following observations can be interpreted. In one copy two watermarks in two separate maps were detected that were not found in any other atlas. The first one concerned the watermark cardinal's hat, type 8 (Fig. 231).¹⁶⁸ The other concerned the watermark lily (Fig. 233). In all copies studied only one sheet of paper with this watermark was detected.¹⁶⁹ A copy in the Vatican Library was also found with several deviating watermarks that were only present in that specific atlas.¹⁷⁰ The first

¹⁶⁷ This map will be described in chapter seven on the atlases; British Library, shelfmark C.1.d.1.

¹⁶⁸ Biblioteca Marucelliana, shelfmark R.A.788, *TABVLA DVODECIMA D'ASIA*; Based on the states of, as well as on the watermarks found in the paper of the maps of this copy, it contained maps of the first and the second type. The maps were all coloured the same way with the green type of colouring characteristic for the second type of maps; This watermark was also detected in the backing of a map found in the Biblioteca Universitaria Alessandrina, shelfmark Inc.541, *TABVLA UNDECIMA DE ASIA*. No reference was found for this watermark.

¹⁶⁹ The watermark lily: Bernstein reference number 17387, WZMA reference number AT4000-220_15; Biblioteca Marucelliana, shelfmark R.A.788, *TABVLA SEPTIMA DE EVROPA*.

¹⁷⁰ Biblioteca Apostolica Vaticana, shelfmark Stamp.Ferr.S.37. Based on the state and the watermark this copy contained a map of the first type, *TABVLA SEPTIMA DE EVROPA*. According to us the maps with the watermark cardinal's hat type 6 should also have to be labeled as first type of maps although all four were coloured with the green type of colouring characteristic for the second type of maps.

one, a ladder watermark, was only partially visible and detected in the sheet of paper with deviating dimensions larger than that of royal paper applied for the maps *TABVLA OCTAVA* and *NONA D ASIA* as described earlier in this chapter (Fig. 234, 503).¹⁷¹ The other deviating watermark concerned the cardinal's hat, type 6 (Fig. 227-30).¹⁷² It was found in four variants in each of the four modern maps. All these watermarks deviate from what is usually found during the second printing phase. The specific character and the fact that they only appear once is characteristic of maps of the first type. In addition, in all these maps only one watermark was detected, which is also a feature of the first type of maps. All these maps were found in the final state. Since these specific maps had reached the final state at the end of the first printing phase, they can be attributed to both the first and the second type of maps based on the state found. The colouring of these maps was characteristic for the second type of maps. We also studied a very special specimen of the map *NOVELLA ITALIA* in a private collection (Fig. 712). This map contained the watermark cardinal's hat type 5 which unmistakably belongs to the first type of maps (Fig. 226). In the backing a lily watermark was present not detected in any other sheet of paper studied in this research (Fig. 310). The map is in the first state, another characteristic of the first type of maps. However, the applied colouring is characteristic for maps of the second type. From all these findings, it can be concluded that at the transition from atlases with the first to the second type of maps, maps of the first type ended up in atlases with maps of the second type with the corresponding colouring. This causes the confusion in the interpretation of the described maps in these two atlases composed at this transition. In order to be able to distinguish between first and second types of maps, the state and type of watermark, and the combination of these two characteristics are the most practical. The presence of one or two and the type of watermarks in the paper used for these maps is in most cases very distinctive. The applied colouring may be of help, although it was always added at a later moment. In most cases, these features will be sufficient to assign the correct type to the map. In some very specific cases, as just mentioned, it may remain difficult to assign a map to the first or second type because characteristics of both types may be present. In that case, the environment and copy in which these maps were found may be of help.

The third printing phase of maps or the Giunti atlases

Skelton writes that the history of printing ended some twenty or more years later, when an unidentified printer had a supply of leftover copies. Based on the census of survivals, this stock must have been considerable. In the sixteenth century, a book with a title on the verso side of the first leaf was out of fashion.¹⁷³ Therefore, the new printer gave the blank recto side a fresh title with a modern layout and a new title printed in red.¹⁷⁴ We already know that the fonts used to print the title in red date from about 1516. They were in use in the printing office of Bernardo Giunti in Florence.¹⁷⁵ Pettas wrote a book about this enterprise.¹⁷⁶ It started with printing religious and classical works. Around 1515, Bernardo took over from his father. He continued the office with the additional publishing of Italian works. Between 1517 and 1522 it flourished. There were some negative influences on the business caused by wars between 1524 and 1527. From 1527 on, after the fall of Rome, the output diminished. Bernardo moved from Florence to Venice in 1533 until 1546 or 1547. The Giunti office published cartographic works from Pontanus in 1520 and Mela in 1526. Pettas described that the Giunti office printed new title pages when necessary in the event of takeovers or damage.¹⁷⁷ This is in accordance with what is known about the title page of the *Geography*.¹⁷⁸ Another indication that it has been republished by Giunti is that the atlas was still listed as stock of the Giunti store at the beginning of the seventeenth century.¹⁷⁹ According to the

¹⁷¹ The watermark was not fully visible and thus not identifiable. Therefore, no reference could be searched for.

¹⁷² The watermark cardinal's hat type 6: WZIS Referenznummer IT5235-PO-32312; Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 1, p. 224, no. 3391.

¹⁷³ Op. cit. (n. 22), p. IX.

¹⁷⁴ Dennis E. Rhodes, Lotte Hellinga, 'Cornelis de Zyryckzee and his practice of reissuing incunables from other presses', *Quaerendo*, 9 (1979), pp. 143-48; Op. cit. (n. 7), p. 181.

¹⁷⁵ Veneziani, op. cit. (n. 153), p. 206.

¹⁷⁶ Op. cit. (n. 7), pp. 1-351.

¹⁷⁷ Ibid, p. 181.

¹⁷⁸ Rhodes, op. cit. (n. 174), pp. 143-48; Op. cit. (n. 153), pp. 198, 205-07.

¹⁷⁹ Roberts, op. cit. (n. 5), *Cartography between cultures: Francesco Berlinghieri's Geographia of 1482*, p. 118.

watermarks found in the paper, the third type of maps must have been printed during the first half of the sixteenth century. Thus, decades after the *Geography* was published and after Berlinghieri's death. This period, during which the maps of the *Geography* were reprinted, coincides with the information about the Giunti office described by Pettas.¹⁸⁰ Thus, we conclude that the Giunti office took over the copper plates for the maps, the stock of the to the intended number printed text pages, and some unsold maps still in stock. This explains why we, although very sporadically, found uncoloured backed maps of the first and second type in Giunti copies. This must concern some leftover impressions of these maps. They must have come into the hands of Giunti when he took over the unbound sets of text and the copper plates. Obviously, they ended up in these second edition atlases in the first quarter of the sixteenth century. The most convincing proof for the commercial failure is the large number of sets of maps Giunti had to print to complement the unsold sets of text.

The first and second type of maps must have been printed atlas by atlas, in two separate printing phases and relatively small numbers as already described. This was not unusual at the time. It is also described in chapter two on the editions prior to 1500 by other scholars for the 1477 Bologna and the 1482 Ulm editions of the *Cosmography*.¹⁸¹ The Giunti printing office had to print sets of maps to bring the numbers of maps back in line with the stock of text pages to be able to compose them into atlases. The number of complimentary printed sets of maps must have been large. This can be concluded from the large number of different watermarks found in the third type of maps. Thus, multiple reams of paper must have been used to print the thirty copper plates.¹⁸² In table four is shown that, based on the watermarks, during this third printing phase different types of atlases were compiled. Many of the watermarks could be dated around 1525 (attachment one). We have placed the atlases in the order depicted in table four, based on the development of the artefact on the map *TABVLA SECONDA DE ASIA* as already described. Based on the watermarks, during the third printing phase in the Giunti office, the maps must have been printed per atlas again, instead of in large print runs per map. Otherwise, the composition of the different atlases cannot be explained.

We would like to clarify another important issue here. Boorsch presents Rosselli as engraver of the maps of Berlinghieri's *Geography*.¹⁸³ She partially based this on the watermarks found in the maps. The watermarks described by her include a crescent in a circle with a cross on top, a crescent with a cross on top, an anvil with a hammer in a circle, and an anchor in a circle. According to Boorsch, these watermarks are present in prints of Rosselli's work, as well as in the copies of Berlinghieri's *Geography* mentioned by her. As an additional substantiation, Boorsch mentions that the presence of these watermarks in the maps was also described by Almagià.¹⁸⁴ We will explain here how that is possible. Francesco Rosselli's son Alessandro died about 1525. Since his children were still minors, an inventory of the shop's contents was drawn up. Neither Berlinghieri's *Geography* nor the copper plates of the maps are on the list. There is no evidence of the date of Francesco Rosselli's death, but it is suggested to be before 1513. Moreover, Rosselli worked in Venice during the first decade of the sixteenth century.¹⁸⁵ From this can be deduced that his son Alessandro ran the shop in Florence. He most likely had prints made of his father's copper plates during his father's absence in Venice and after his death. From the watermarks, as well as the copies, described by Boorsch can be concluded that she must have studied second edition copies of the *Geography*, printed by Giunti in the sixteenth century after 1516. That explains the similarity with the watermarks found in obviously later states or print runs of Rosselli's prints, most likely printed by order, or by his son Alessandro. In addition, Rosselli's work may even have been printed after Alessandro's death by someone who took over the inventory. Boorsch's theories about the watermarks cannot be used to support Rosselli as engraver of the maps of the *Geography*. But, from the

¹⁸⁰ Op. cit. (n. 7), pp. 55, 61, 65-72.

¹⁸¹ Claudius Ptolemaeus, *Cosmographia: Bologna 1477*, with an introduction by Raleigh A. Skelton (Amsterdam 1963), pp. VII-VIII; Claudius Ptolemaeus, *Cosmographia Ulm 1482*, with an introduction by Raleigh A. Skelton (Amsterdam 1963), pp. VIII-IX; Op. cit. (n. 40), p. 64.

¹⁸² The maps *TABVLA OCTAVA AND NONA D ASIA* were engraved together on one copper plate.

¹⁸³ Op. cit. (n. 15), p. 153; In the first decade of the 16th century Francesco worked in Venice. His son Alessandro ran the shop in Florence until his death in 1525. The copper plates of the *Geography* were not on the inventory list drawn up at that time. According to Boorsch, these remained with Berlinghieri or Tedescho.

¹⁸⁴ Ibid, p. 165; Op. cit. (n. 2), p. 219-20.

¹⁸⁵ Op. cit. (n. 15), p. 166.

information provided by her can be deduced that Giunti's copies of the *Geography* may have been printed before 1525.

We want to conclude this chapter with some statements about watermarks and the paper made by Roberts.¹⁸⁶ He mentions the presence of a ribbon watermark in five atlases with their maps printed on uniformly sturdy paper.¹⁸⁷ With exception of the atlas intended for Bayezid in Istanbul we studied all these copies in person or received information and images by e-mail. In none of them, nor in any other copy studied by us, this type of watermark was detected. Two of the atlases mentioned by Roberts, in Chicago and the Vatican City, contain the watermark P. The curved part of this watermark is often difficult to perceive. The straight part can be detected somewhat easier. In these atlases he may have mistakenly identified the straight part of the P watermark as a ribbon watermark. An example of a P



Fig. 713

watermark with a curved part which was difficult to detect is depicted in (Fig. 713). Additionally, we want to mention that Roberts missed the fact that the maps in all these atlases were backed with a second sheet of paper. That made the paper feel sturdy. This is not mentioned anywhere in his books. We observed that sometimes the chain lines were thickened or lay on top of each other in the backed maps. That feature may also have been misinterpreted as a ribbon watermark. This may have been the case for the copies in Turin and Naples in specific. The one in Turin was studied in person. We only detected the watermarks cardinal's hat, type 1, and the shearer scissors in the maps of this atlas. The copy in Naples was not studied in person but extensively researched by the staff of the library. They informed us that they only detected examples of the cardinal's hat watermark in the maps, the same as present in the paper of the text pages.

They added that it was difficult to detect the watermarks because of the colouring and the backing. In addition, the ribbon watermark is not present in the catalogues about watermarks from Briquet.¹⁸⁸ Based on the above, it is more than likely that the ribbon watermark does not exist.

Summarising all the data up to this point, we can state the following. The printing of the *Geography* started after *La Divina Commedia* was completed, in the last quarter of 1481. Tedesco needed about 65 reams of paper for the text pages including the interleaves and perhaps the fly and end leaves. If the engraving of the copper plates for the maps began around Berlinghieri's return from Mantua at the end of 1480 or early 1481, then it is credible that they were ready to be printed in 1482. The text pages for the *Geography* were printed in two halves to the intended number. They have been printed in an unusual order as printing started with Liber Quartus. Halfway Liber Secundus the printing of the text pages was interrupted. During this break a small number of the so-called first type of maps were printed. Next the second half of the text was printed. Immediately afterwards, a somewhat larger number of the second type of maps were printed. In total only a limited number of sets of maps of the first and second type were printed. The number did not come close to the number of printed sets of text. Obviously, the *Geography* was not a commercial success. At some point in time the Giunti printing office took over the remaining stock of sets of text, some maps, and the copper plates, probably from the Berlinghieri family. Giunti supplemented the missing sets of maps to complete the already printed stock of sets of text in several print runs. He further added a title printed in red on the verso side of the title page and the page with the register and colophon. So, there are two editions of the *Geography*. The first edition can be dated 1482 and contains maps printed during two separate printing phases and with quite different characteristics. The second edition can be dated about 1520-25. This reissue contains maps printed by Giunti.

¹⁸⁶ Roberts, op. cit. (n. 5), *Cartography between cultures: Francesco Berlinghieri's Geographia of 1482*, p. 123.

¹⁸⁷ Topkapi Sarayı Müzesi Müdürlüğü, shelfmark G.I 84; Biblioteca Nazionale Universitaria di Torino, shelfmark XV.I.42; Biblioteca Nazionale Vittorio Emanuele III, shelfmark S.Q.X.K.15; Biblioteca Apostolica Vaticana, shelfmark Inc.S.120; Chicago Newberry Library, shelfmark Ayer 6.P9 B5 1480a; Chicago Newberry Library, shelfmark Ayer 6.P9 B5 1480b.

¹⁸⁸ Briquet, op. cit. (n. 84).

CHAPTER 7

Berlinghieri's Geography: the printed atlases

Introduction

In the previous chapters we discussed the different features of the text pages and the maps independently. In this chapter, the content and specific features of the different atlases studied, will be discussed. To fully understand the complete atlases, the data and features described in the previous chapters have to be interpreted jointly. We opted for this order and structure because it soon became apparent that not a single atlas remained in its original state. Many were restored, reassembled, and re-bound in the eighteenth and nineteenth century, when renewed interest in incunabula arose. This has contributed to the preservation of many copies. Unfortunately, this came at a price. It was fashionable at the time, to provide libraries with identical bindings in pre-determined sizes. Many books were trimmed when re-bound, sometimes with loss of map image. In addition, the contents can vary in composition because of missing or later added text leaves and maps from other incomplete copies. On the following pages the main features of 44 of the approximately remaining 108 atlases studied are described.¹ By far the most of them were studied at first hand. In addition, we received partial information and photographs of some copies, from libraries with examples in their collection. A digital version of several examples could be downloaded in high resolution.² Images of two copies could be viewed only on the internet.³ The two related manuscripts, in collections in Milan and the Vatican City, were also studied in person.⁴ They will be discussed in chapter eight on the manuscripts. The information collected in this book will provide an apt research tool for copies we did not include in our research.

Working method

The atlases are described as follows. First, general characteristics such as city, library, and the shelfmark of the specific copy are described. Then, more general characteristics of the atlases follow, for example the cover and the collation. Next, the content from fly leaves to end leaves and everything in between is presented. A description of the illumination of the text pages and the colouring of the maps follows. We conclude by mentioning specific details. For reasons of readability and relevance, not every detail found in the different copies is included. Also, because at a certain level, observations can become more subjective and debatable in nature. With regard to the collation, we would like to mention that 'correct' means everything is placed completely or almost completely in the right order, even if text leaves or maps were missing. Sometimes a map, as is often the case with the modern ones, a text leaf or an interleaf is found misplaced. With the liber indication engraved in the center of the plate, the essential information for the binder in which Liber and in what order the maps should be placed was provided.⁵ Obviously, that information sometimes got lost during rebinding or was not visible. 'Incorrect' is used when the collation was definitely in the wrong order. For example, when all the maps were placed in front

¹ According to the Incunabula Short Title Catalogue of the British Library, https://data.cerl.org/istc/_search?query=berlinghieri&from=0; No numbers are known about copies in private collections.

² Bibliothèque nationale de France, shelfmark C 2035 9; Biblioteca de Catalunya, shelfmark Inc. 47-Fol.

³ <http://beta.historicmapworks.com/Atlas/OL/107323/>;

<http://incunaboli.accademiadellacrusca.org/theke/schedaimmagine2.asp?es=0&radice=000189809>

⁴ Biblioteca Nazionale Braidense Milano, shelfmark AC.XIV.44; Biblioteca Apostolica Vaticana, shelfmark Urb.lat.273.

⁵ A difference has been discovered between the order of the maps according to the liber indication printed on the map and the order shown on the page with the register and colophon. The liber indication positions the maps *HISPANIA* and *GALLIA NOVELLA* consecutive to the maps *TABVLA SECVNDA DE* and *TERTIA D EVROPA*. In contrast on the page with the register and colophon both *NOVELLA* maps are positioned in between the regular maps. In this book we have applied the order in accordance with the liber indication on the maps. The reason for this was that according to us the page with the register and colophon was first added to the second edition copies.

of, in between, or following the text leaves, or even more randomly, and in case several pages of text or gazetteers were incorrectly inserted. The interleaves also require an explanation. The collation of the first edition atlases includes the presence of four blank interleaves. Based on the watermarks these must have been inserted by Tedescho following the text of Liber Secundus, Tertius, Sextus, and Septimus. Out of these four, the last one seems to be missing the most often. It may have got lost because of damage during storage, or later due to a restoration and rebinding. This interleaf may also have been displaced during rebinding and been reinserted as end leaf. In several atlases an original blank leaf was found somewhere near the end of an atlas with the same watermarks or paper structure as the text leaves. It is very probable that an interleaf may have ended up elsewhere, as the collations were regularly reorganized during rebinding. In only two atlases, original blank fly leaves were found.⁶ In one of these two copies, an original blank end leaf was found as well. In either case, the number of surviving fly and end leaves was extremely small. This seems another justification for labeling the blank leaf found at the end of an atlas, in circumstances as described above, as interleaf instead of end leaf. Another point of interest concerns the contemporary backing of the maps: an extra sheet of paper was attached to the verso of the map, contemporary to the printing of the maps. 'Not applied', is used for maps without backing as well as for maps backed with more recent paper or material for restorative purposes. This later form of backing will be mentioned elsewhere in the description of those copies. One last comment concerns the leaf with the register and colophon. 'Not present' is applied to the first edition atlases. Based on our research, we are of the opinion that the leaf was not added to this edition. 'Missing' is used in case the leaf was not present in second edition atlases. According to us, the leaf with the register and colophon belongs to the second edition atlases.

General findings

It was not possible for us to study all the extant copies.⁷ We are however convinced that we have researched sufficient material to explain the main features of Berlinghieri's *Geography* with great detail. Originally, the literature has described three types of the book.⁸ This division was based on the compilation: the presence of the title printed in black, with or without the page with the register and colophon, or with the title printed in red accompanied by the page with the register and colophon. During our research we encountered many examples that did not fit this classification. This was caused by centuries of use, rebinding, damage and the recompiling of examples from different sources. We are of the opinion that a better division would be based on the two editions, with a subdivision of the first edition into two types, for each of the two printing phases of the maps, and the second edition in a third type. The most distinctive difference are the watermarks in the paper of the maps. These are specific for the different types. In addition, the maps of the first edition printed during the second printing phase were all printed on two leaves of paper mostly with a watermark in both halves.⁹ This makes it the most practical, easy to apply, and secure classification we can think of.

A concentration of the earliest printed, exceptionally well illuminated, and coloured copies was found in Italy. Some are also present in collections in other countries, but less frequently. These early examples are the most interesting ones because they reveal the early stages of the development of the maps and provide information about the production process. Atlases belonging to the second edition, printed by Giunti, occur in a greater number and are more widespread. Copies with only text or maps also exist.¹⁰ Even a copy with a set of maps and a set of text leaves clearly originating from two different sources was studied.¹¹ These specimens were recomposed from other even more incomplete and

⁶ Biblioteca Nazionale Centrale di Roma, shelfmark 70.1.G.5; Biblioteca Apostolica Vaticana, shelfmark Stamp.Ferr.S.37.

⁷ For example, we have not found a copy of the map *HISPANIA NOVELLA* with the first and erroneously engraved title *GALLIA NOVELLA*, of which an impression could be expected to surface.

⁸ Claudius Ptolemaeus, *Francesco Berlinghieri Geographia Florence 1482*, with an introduction by Raleigh A. Skelton (Amsterdam 1966), p. X; Henry N. Stevens, *Ptolemy's Geography* (Amsterdam 1972), pp. 38-9.

⁹ Only some maps of the second edition with the watermark hand with a star on top were also printed on two separate leaves of paper as described in chapter six on the maps.

¹⁰ Biblioteca Comunale degli Intronati, shelfmark O.II.35, text only; Biblioteca Nazionale Braidense Milano, shelfmark AK.XVI.13, maps only.

¹¹ Biblioteca Casanatense, shelfmark Vol.Inc.1110.

damaged copies. As already mentioned, all atlases studied were re-bound. Nevertheless, two copies seemed to have an original cover.¹² Only two original fly leaves were present in one of those copies. It can be concluded that over the centuries, the original covers and the first leaves unfortunately have been lost in nearly all cases.¹³

We are sure about the existence of several other richly illuminated and coloured examples that were not included in our study. It concerns the copies in Istanbul, originally owned by Bayezid the son of Sultan Mehmed II, in Arezzo, originally owned by Roberto Malatesta and his wife Elisabetta da Montefeltro the daughter of Federico d'Urbino, and in Paris, originally owned by King of Hungary Matthias Corvinus.¹⁴ We did study "siblings" of these copies, for example Cem's copy, the other son of Sultan Mehmed II, or the printed copy for Lorenzo de Medici, one of the two persons who also received the *Geographia* in manuscript.¹⁵ The copies for the Pucci family, Giustinopoli, and possibly the king of Naples compare very well to those intended for other and comparably high-ranking people such as the king of Hungary.¹⁶ Possibly there are more surviving specimens that we do not know about or have identified. It should be noted that some of the most remarkable and important discoveries were made in less obvious atlases. The very important and unique proofs in an unobtrusive copy in London were a true gift.¹⁷ Another remarkable find was a copy in Milan, which provided the only example of text printed in red.¹⁸ These less abundant executed atlases are scientifically at least as important as the most lavishly illuminated and coloured copies. In the last part of this chapter a general overview of all atlases studied is given (see also attachment two). But first we would like to discuss a couple of special features, maps, and the atlases they belong to in the following paragraphs.

Special observations regarding the composition, the maps, and the atlases

Frontispiece and register and colophon

The frontispiece and the leaf with the register and colophon were sometimes found lacking. We did not find a single first edition copy with an original leaf with the register and colophon. Nevertheless, this leaf was present in three first edition copies. In Rome the page was added in facsimile (Fig. 714-15).¹⁹ In the Vatican City the leaf was found in a smaller format and clearly did not belong to this atlas.²⁰ In London an original leaf with the register and colophon was detected in a copy in which the title page was added in facsimile together with some maps printed by Giunti with a different size and not backed.²¹ In addition, several notes were found in this copy stating that the leaves with the title, as well as the register and colophon, and some maps were missing. These three leaves with the register and colophon were clearly added later during a restoration. Register and colophon are on the contrary often and mostly present in copies of the second edition, in its original condition, with the correct watermark. An absence of this leave in these later edition copies is probably caused by the loss of the cover and the outer leaves of paper. Similarly, the frontispiece may have been lost. In case of a first edition copy, it is understandable that during a restoration such an atlas was completed with a frontispiece with the added title printed in red from an incomplete Giunti specimen.²² The number of copies printed by Giunti was significantly larger and therefore more of them must have been available for restoration purposes.

¹² Biblioteca Apostolica Vaticana, shelfmark Stamp.Ferr.S.37; Biblioteca del Seminario arcivescovile maggiore, shelfmark D III 56.

¹³ In a previous study of the different Rome *Cosmography* editions original covers were also rarely found; Robert H.J. Peerlings, Frans Laurentius, Jaap van den Bovenkamp, 'The watermarks in the Rome editions of Ptolemy's *Cosmography* and more', *Quaerendo* 47, (2017), p. 323.

¹⁴ Topkapi Sarayı Müzesi Müdürlüğü, shelfmark G.I 84; Biblioteca Comunale, shelfmark AA.1; Bibliothèque nationale de France, shelfmark RES-G-66.

¹⁵ Biblioteca Nazionale Universitaria di Torino, shelfmark XV.I.42; Biblioteca Medicea Laurenziana, shelfmark Inc.I.5.

¹⁶ Biblioteca Nazionale Centrale di Roma, shelfmark 70.1.G.5; Biblioteca Universitaria Alessandrina, shelfmark Inc.541; Biblioteca Nazionale Vittorio Emanuele III, shelfmark S.Q.X.K.15. Bibliothèque nationale de France, shelfmark RES-G-66.

¹⁷ National Maritime Museum, shelfmark PBD 7690.

¹⁸ Biblioteca Nazionale Braidense Milano, shelfmark AK.XVI.12.

¹⁹ Biblioteca Casanatense, shelfmark Vol.Inc.1110.

²⁰ Biblioteca Apostolica Vaticana, shelfmark Inc.S.120.

²¹ National Maritime Museum, shelfmark D7690.

²² Biblioteca Casanatense, shelfmark Vol.Inc.1110.

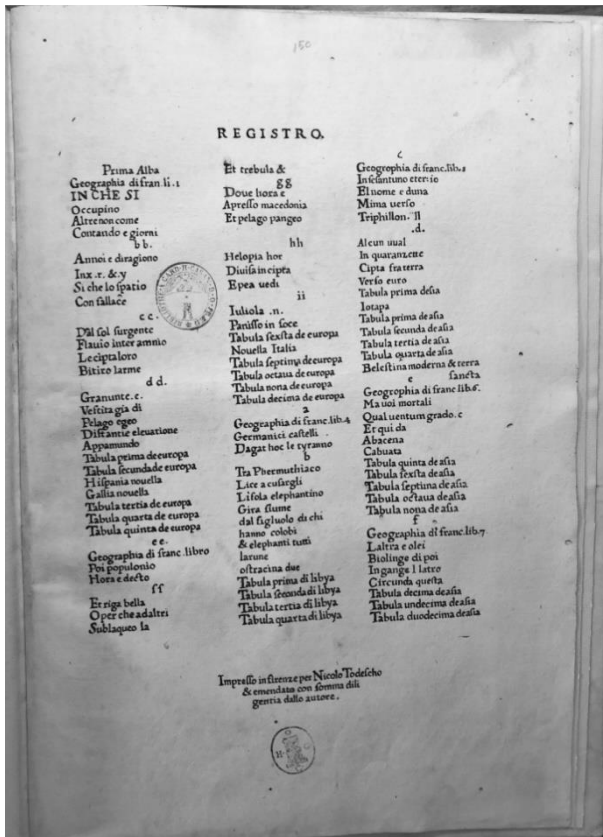


Fig. 714

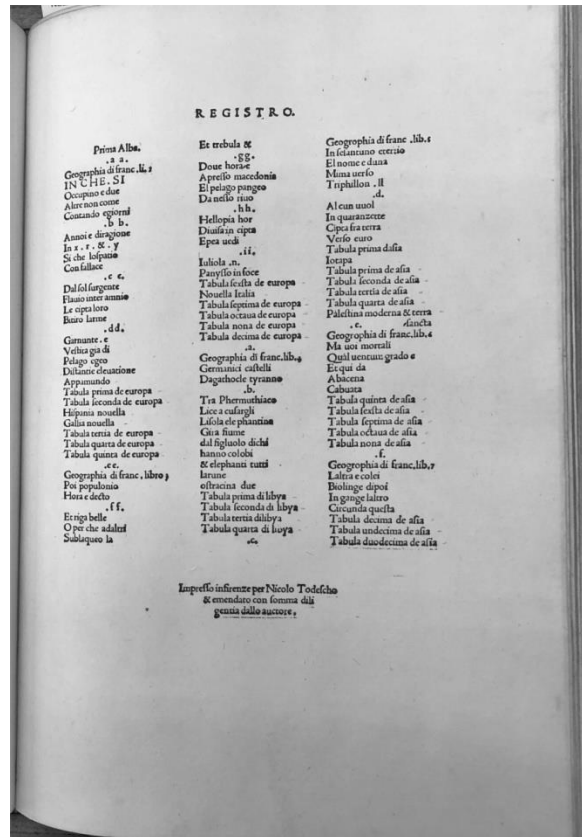


Fig. 715

Interleaves

Interleaves are found, almost by default, in the first edition atlases, although not always all four. Their presence is less common in the second edition atlases reissued by Giunti. Based on this difference, this addition of blank paper must have been something that either Tedesco or Berlinghieri purposely administered. By the time Giunti reissued the book, the meaning and purpose of these leaves was perhaps lost, and they were therefore not supplemented or left out. Nevertheless, based on the watermarks in the paper, the interleaves found in the Giunti copies consisted of original paper (Fig. 204-15). Probably they were already inserted in the remaining sets of text leaves taken over by Giunti. An additional discovery relating to interleaves concerns the first four atlases described in this chapter. These most luxurious illuminated and coloured examples contain two additional interleaves in front of the maps *TABVLA OCTAVA* and *NONA D ASIA*. Since these two maps are only half the size of a regular map, a blank leaf was inserted in front of them, to enhance the presentation. They were probably inserted at the workshop that executed the colouring and illumination, or by the bookbinder. The watermarks present in these leaves were not found in the regularly used paper for the text and the maps in the *Geography* (Fig. 216-21). However, there was one exception. The lily in a circle watermark in one of these interleaves was found in a map and in the paper some maps were backed with (Fig. 218, 232, 303-07). Also in the sixth copy, described in this chapter, two additional interleaves were present. In these leaves the same watermarks were found as in the backing of the maps of this atlas. They were present at an illogical position, consecutive to the map *TABVLA QVARTA DI LIBYA*, and on the location of the last interleaf. These will probably have been the additional leaves originally in front of the maps *TABVLA OCTAVA* and *NONA D ASIA*. They must have been inserted wrongly during later rebinding (Fig. 220-21).

The dedication

It is suggested that the dedication was adapted to Federico d'Urbino, sometime after most of the book had already been printed. Jacobs assumed that the work was done no later than in 1480.²³ Skelton himself rather thinks of the date of Mehmed's death in June 1481, based on the presence of an illuminated presentation copy in Istanbul.²⁴ This example is accompanied by a letter from Berlinghieri which has been described by Almagià, Jacobs, and Babinger.²⁵ In the heading, the letter is addressed to Sultan Mehmed II. The text is addressed to Bayezid himself. On the third sheet of this copy the usual dedication to Federico is covered by a similar dedication to Sultan Mehmed II. It is painted in golden letters on a blue background. In short, all dedications to Federico of Urbino have been replaced by similar ones to Sultan Mehmed II or Bayezid. Berlinghieri wrote in his letter that he originally intended to dedicate the book to Sultan Mehmed II.²⁶ Unfortunately, this was thwarted by his death on May 3, 1481. He then wanted to dedicate it to Federico d'Urbino, who in turn also died. Now he offered the book through his fellow citizen Paolo da Colle to Mehmed's son and successor Sultan Bayezid. Therefore, the letter must have been compiled after the death of Federico d'Urbino.²⁷ Halfway 1483, Paolo da Colle travelled to Istanbul. He served as an agent of Lorenzo de' Medici at the Ottoman court.²⁸ Almagià assumes he had Bayezid's copy with him on that journey. A second presentation copy of Berlinghieri's *Geography* was sent to Cem, the other son of Sultan Mehmed II and half-brother of the new Sultan Bayezid, in the summer of 1484.²⁹ It may also have been delivered by Paolo da Colle. Cem lived in a castle of the Knights of Rhodes in the Savoy. He had become a pawn in the political game between the Ottoman court and

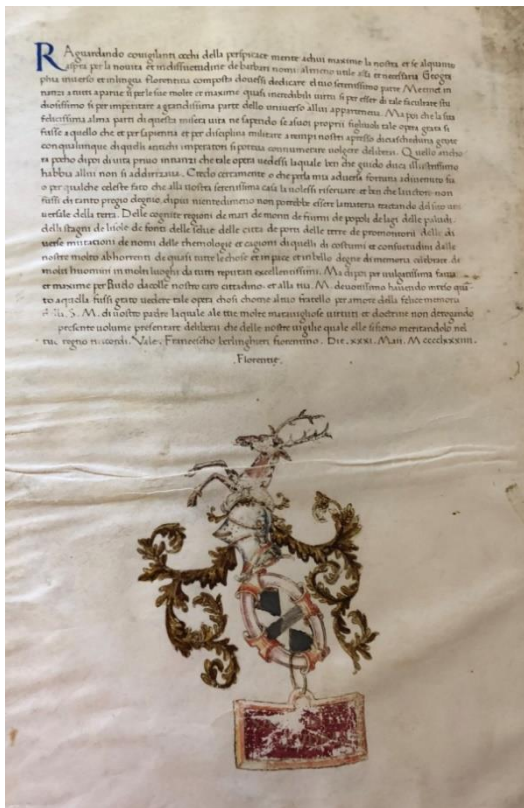


Fig. 716

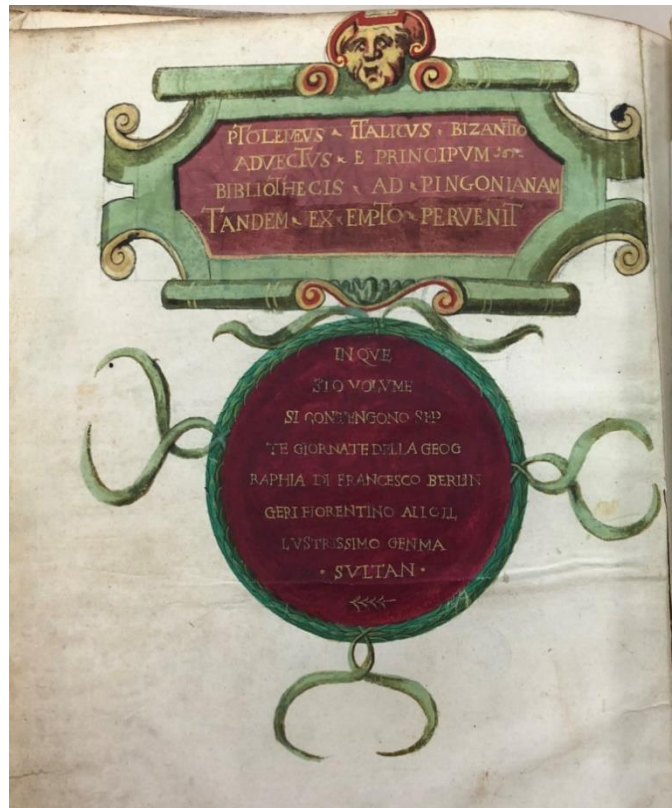


Fig. 717

²³ Emil Jacobs, 'Zur Datierung von Berlinghieris *Geographia*', *Gutenberg Festschrift*, (1925), p. 251.

²⁴ Skelton, op. cit. (n. 8), pp. VII-VIII.

²⁵ Roberto Almagià, 'Osservazioni sull'opera geografica di Francesco Berlinghieri', *Archivio della R. deputazione romana di storia patria*, 68 (1945), p. 226; Franz Babinger, 'Reliquiensbacher am Osmanenhof im XV. Jahrhundert', *Bayerische Akademie der Wissenschaften*, 2 (1956), p. 22; Jacobs, op. cit. (n. 23), p. 250.

²⁶ Jacobs, op. cit. (n. 23), p. 250; Almagià, op. cit. (n. 25), pp. 225-26; Babinger, op. cit. (n. 25), pp. 21-2.

²⁷ Op. cit. (n. 8), p. VII.

²⁸ Sean Roberts, *Cartography between cultures: Francesco Berlinghieri's *Geographia* of 1482* (Michigan 2006), p. 8; Sean Roberts, *Printing a Mediterranean world: Florence, Constantinople, and the renaissance of Geography* (London 2013), p. 5.

²⁹ Almagià, op. cit. (n. 25), pp. 221-23.

European rulers, including Lorenzo de Medici.³⁰ The presentation copy intended for Cem is currently in the collection of a library in Turin.³¹ Like Bayezid's copy, it contains a letter on parchment in manuscript form. The letter is dated May 31, 1484 (Fig. 716). Cem's name was apparently painted to replace Federico's in the title. In the header of the text the devotion to Cem is illuminated in manuscript form, golden letters on a red background (Fig. 717). The rest of the page is printed as in Bayezid's copy.³² Babinger qualifies the letters to Bayezid and Cem as quasi-official.³³

In chapter eight on the manuscripts we will show that the text was not processed until around Sultan Mehmed's death. Therefore, a dedication to him cannot be disrupted by this event as written by Berlinghieri in the letters above. Of course, the book could still have been dedicated to Sultan Mehmed after his death. In the end, this was the case with Federico d'Urbino. However, then it would have been logical that a copy in manuscript form had been offered to Sultan Mehmed or his successor as was the case with Federico. That does not seem to have taken place. In fact both his son and successor Bayezid, as well as the other son and rival in exile Cem, received illuminated printed versions of the *Geography*. Moreover, the *Geography* contains pieces of texts that are not very complimentary to the Ottomans and in Cem's copy even Ficino's *apologia* to Federico is not removed. That would probably not have been the case when the book had been dedicated to Sultan Mehmed.³⁴ Skelton's justification for the dedication to Sultan Mehmed is, besides the letters, based on his theory that the production of the book had already started well before 1481, which is incorrect as we have substantiated. Roberts wrote a dissertation and a book on this subject and the alleged dedication, but ultimately concludes that the *Geographia* was not dedicated to Sultan Mehmed even though he had an interest in mapping and geography. He states it was opportune to perpetuate old relationships and the like but not preconceived.³⁵ We believe that Berlinghieri certainly had diplomatic intentions in donating two precious copies to the possible successors of Sultan Mehmed. The relations between Florence and the Ottoman Empire are extensively described.³⁶ Aside from the threat through the invasion of Italy by the Ottomans and the subsequent fall of Otranto in 1480, the Medici owed Sultan Mehmed. Bernardo Bandini de Baroncelli, one of the Pazzi conspirators and murderer of Lorenzo's brother, had been caught after a one-year stay in Constantinople. Sultan Mehmed handed him over to Florence in December 1479 where he was hanged later that month next to Vespasiano da Bisticci's store.³⁷ Nevertheless, there are no concrete indications for the existence of a manuscript copy for Sultan Mehmed. We are therefore of the opinion that the book was never intended for him. Berlinghieri took more than fifteen years to complete the text of the *Geography*. Only at the end a thought was given to whom to dedicate the work. Eventually, at the end of the production process Federico became the dedicatee although he also died prematurely. Like Sultan Mehmed, Federico d'Urbino had been a regular threat to Florence and the Medici family. As a mercenary paid for by the enemies of Florence and the Medici, he repeatedly led troops against Florence.³⁸ However, shortly before the dedication of the *Geographia* to him, he fought on behalf of Florence, won and thus also saved the Medici.³⁹ Given the existence of a manuscript unmistakably intended for him, in combination with the text and the *apologia* addressed to him in the printed version we can only conclude that he must have been the only dedicatee of the *Geographia*. The chronology of the origins of the *Geography* described by us in this book ties in with the course of events and Federico's activities on behalf of Florence. For diplomatic and political reasons, or because of relations, several more presentation copies were handed

³⁰ Op. cit. (n. 8), p. VII.

³¹ Biblioteca Nazionale Universitaria di Torino, shelfmark XV.I.42; A facsimile edition is published by the Consiglio regionale del Piemonte, Biblioteca Nazionale Universitaria di Torino, Centro Studi Piemontesi, Fondazione CRT, *Berlinghieri Geografia* (Torino 2006). The illumination of the text pages is not continued completely and consequently throughout the complete copy.

³² Op. cit. (n. 8), pp. VII-VIII.

³³ Ibid, p. 7; Roberts, op. cit. (n. 28), *Cartography between cultures: Francesco Berlinghieri's Geographia of 1482*, pp. 266, 270; Roberts, op. cit. (n. 28), *Printing a Mediterranean world: Florence, Constantinople, and the renaissance of Geography*, pp. 5, 164-65.

³⁴ Roberts, op. cit. (n. 28), *Cartography between cultures: Francesco Berlinghieri's Geographia of 1482*, pp. 261-62, 269-73, 279-82.

³⁵ Ibid.

³⁶ Ibid.

³⁷ Ross King, *The bookseller of Florence* (Amsterdam 2021), pp. 380-88.

³⁸ King, op. cit. (n. 37), pp. 358-60.

³⁹ Ibid, p. 411.

over to Cem and Bayezid, King Ferdinand of Naples, and or Alfonso of Calabria, and Roberto Malatesta, a mercenary captain like Federico and married to his daughter, who also threatened Florence and the Medici. This fits into the picture.

Second edition maps added to first edition atlases

The first special feature of some of the atlases that we wish to discuss is in line with the findings in the previous paragraphs. It concerns the addition of maps from second edition copies to first edition atlases. We have already described that only a limited number of first edition atlases were printed during the first and second printing phases and an even smaller number remained intact. The Giunti edition, printed some forty years later, was much larger and there are more extant copies.⁴⁰ Therefore, it is explicable that incomplete Giunti copies have been used for restoration and completion purposes during the eighteenth and nineteenth century. It is quite easy to distinguish them from the earlier edition. These maps were not backed in contrast to the first edition maps; they are more uniformly and better printed by more experienced hands, and they usually have a different size, patina, and appearance compared to the other maps in these atlases. The first example concerns a copy in London with predominantly maps of the first type.⁴¹ In this atlas notes were made that the map *PALESTINA MODERNA ET TERRA SANCTA*, as well as *TABVLA QVINTA* and *VNDECIMA DE ASIA* and *TABVLA DVODECIMA D ASIA* were missing. These missing maps were added at some stage after this annotation was made. In these substituted maps watermarks belonging to the third type of maps printed by Giunti were found. The size of these four maps is also quite different compared to the other maps. This makes it easy to distinguish them. Except for the four mentioned, two more maps from this copy contained watermarks belonging to the third type of maps, namely *TABVLA TERTIA D EVROPA* and *NOVELLA ITALIA*. The size of these two maps was not that different from the other maps. However, the fact that these six maps are not backed with another sheet of paper, in contrast to the other maps present in this atlas, suggests that all six were probably added at a later stage (see table four). Obviously, this copy has been restored and completed later with maps of the third type printed by Giunti. The same phenomenon was discovered in a copy of the British Library.⁴² This was a damaged and clearly restored copy with predominantly maps with watermarks belonging to the second type of maps in both halves of the paper. Exceptions were found in the maps *NOVELLA ITALIA*, *TABVLA SEPTIMA DE EVROPA*, *PALESTINA MODERNA ET TERRA SANCTA*, and *TABVLA DVODECIMA D ASIA*. In all these maps a watermark belonging to the third type of maps printed by Giunti was found. In each map only one watermark was present, as could be expected with this type of map. Again, these maps also must have been added as substitute for the missing or damaged ones of the second type originally belonging to this copy (see table four).

First edition maps in second edition atlases

In London an unexpected example of the opposite was found as well.⁴³ This atlas was in all aspects a typical example of a Giunti specimen, except for three maps. The map *TABVLA SEXTA DE ASIA* in the second and final state contained the watermarks cardinal's hat type 1d, the map *TABVLA VNDECIMA DE ASIA*, which only exists in the first state, contained type 1c and the map *TABVLA DVODECIMA D ASIA* in the third and final state contained type 7. Based on the watermarks, the first two maps originate from the first printing phase. The third one belongs to the second printing phase. The last two examples were backed. In the backing of the map *TABVLA VNDECIMA DE ASIA* a cardinal's hat watermark was found but the type could not be assessed (see table four). The size of the paper of these maps was the same as that of the other maps in this copy but they have been trimmed when they were re-bound, some into the map image. First edition atlases are much rarer and did often end up in

⁴⁰ Roberts, op. cit. (n. 28), *Cartography between cultures: Francesco Berlinghieri's Geographia of 1482*, p. 54; According to us it is virtually impossible that the maps from the first printing phase described above have been available and used for this purpose. As indicated above, these are bound in the most prestigious specimens preserved in the most renowned institutions.

⁴¹ National Maritime Museum, shelfmark PBD 7690.

⁴² British Library, shelfmark C.1.d.1.

⁴³ British Library, shelfmark G.8173.

well-known collections. It is therefore unlikely that incomplete first edition copies were available for restoration purposes. Besides, this would also imply that exactly the abovementioned maps from an incomplete copy should be available. The chance of that being the case is very small. It is much more probable that it concerns impressions that for some reason were left over and forty years later taken over and further processed by Giunti along with the remaining stock of sets of text and the copper plates. This is confirmed by a Giunti copy present in Brussels.⁴⁴ In this atlas three maps, *HISPANIA NOVELLA*, *TABVLA QVINTA D EVROPA*, and *TABVLA DECIMA DE EVROPA*, were found with the watermark P, which is characteristic for first edition maps belonging to the second printing phase (see table four). All three were in the final state and not backed. Although re-bound during the nineteenth century, this copy was in an excellent condition. It is therefore not likely that maps from this atlas were lost and had to be supplemented. Additionally, there were no size differences between the maps. The map *HISPANIA NOVELLA* is one of the larger maps in the *Geography*. Therefore, the loss of some map image after trimming is likely for this map, which was not the case in this copy. That is an extra confirmation that these three maps have been part of this set of maps from the start. A third example concerns another Giunti copy found in London.⁴⁵ In this atlas two uncoloured but backed first edition maps in the first state were detected (see table four). These are that rare that they could hardly have been available for restoration purposes. This example will be discussed further on together with the Alessandrina copy.

First and second type of maps together in one atlas

The next special feature we want to discuss concerns the simultaneous finding of maps belonging to the first and second printing phases in one atlas. The most obvious example of this is a copy in Florence.⁴⁶ It clearly contains maps in the first state printed during the first printing phase as well as maps printed during the second printing phase in a later state. The same type of green colouring was applied to all the maps and almost all maps contained the same watermark in the backing, anchor in a circle with a star on top type 1 (Fig. 319, table four). In an atlas in Rome the maps *GALLIA NOVELLA* and *TABVLA QUINTA DE ASIA* contained only one watermark, the cardinal's hat type 1c.⁴⁷ Both maps were in the second state and were neither backed nor coloured. Based on the type of watermark and because only one watermark was present in the map, we suppose that both maps are of the first type. They may be examples of the last printed maps during the first printing phase in the second state. However, based on the state it may also concern some leftover paper that was used up during the second printing phase (see table four). In an atlas in London, also in the maps *GALLIA NOVELLA* and *TABVLA QUINTA DE ASIA*, only one watermark was present, this time the cardinal's hat type 1d.⁴⁸ The states of these maps were respectively the second and the first state. Both maps were neither backed nor coloured. The map in the first state must belong to the first type of maps (see table four). Being severely restored, some reservation with regard to this atlas is valid. The examples found in these last two copies might indicate that perhaps not all maps of the first type were backed and coloured. Another example of an atlas with first and second type of maps together was present in the Vatican City.⁴⁹ The vast majority of the maps in this copy represent examples of the second printing phase and the second type of maps. This is based on the state, the watermarks, and the applied colouring as far as present. The map *TABVLA SEPTIMA DE EVROPA* in this atlas clearly belongs to the first printing phase based on the watermark shearer scissors, and because it was one of only two of these maps that were found in the first state. The map was not backed nor coloured. In the map *TABVLA QVARTA DE ASIA* in this atlas the watermark crossbow in a circle was found. This watermark was only detected in two other maps in a copy in London.⁵⁰ Based on the watermark, all three maps may be assigned to the first printing phase. As they were found to be in the second state, this could indicate that they might belong to the second printing phase. Exclusively in this atlas several variants of the watermark cardinal's hat type 6 were found in the

⁴⁴ De Koninklijke Bibliotheek van België, shelfmark Inc C 208.

⁴⁵ Royal Geographical Society, shelfmark CA15F-001.

⁴⁶ Biblioteca Marucelliana, shelfmark R.A.788.

⁴⁷ Biblioteca Casanatense, shelfmark Vol.Inc.1110.

⁴⁸ British Library, shelfmark C.1.d.1.

⁴⁹ Biblioteca Apostolica Vaticana, shelfmark Stamp.Ferr.S.37.

⁵⁰ National Maritime Museum, shelfmark PBD 7690.

four modern maps as well as in the fly and interleaves (Fig. 203, 213-14, 227-30).⁵¹ Based on this watermark, these four maps may be assigned to the first printing phase. But again, being in the final state, it could also point to the second printing phase. Finally, this atlas contained one more peculiarity. The maps *TABVLA OCTAVA* and *NONA D ASIA* were printed together on one sheet of paper. A type of ladder watermark was detected in this sheet (Fig. 234, 503, table four). The watermark could not be fully analysed. However, more than enough was discernible to determine that it did not correspond with any other watermark found in the *Geography*. In addition, this sheet of paper felt different and thicker, although not as stiff as a backed map. The width of this sheet of paper was more than three cm larger than the size of other maps. We suppose the reason for this is that these two maps together are a little bigger than the other ones, just like the world map. Therefore, we assume that an even larger-sized sheet of paper was applied here only once. Based on the watermark and the deviating size of the sheet of paper we catalogue these maps as belonging to the first type. Nevertheless, we cannot prove this with certainty. Despite the limitations mentioned, it is clear and unmistakable that some maps belonging to the first printing phase ended up in atlases together with maps of the second printing phase. This is not surprising since they were printed and further processed in fairly short succession. A possible explanation for the presence of maps in the first state in atlases with maps of the second type could be that during the backing and colouring of maps from the first printing phase something went wrong. As a result, an incomplete set remained that was supplemented with maps from the second printing phase. Maps on paper belonging to the first printing phase in a later or the final state may not be distinguishable from maps printed on leaves of residual paper belonging to the first printing phase processed during the second one. In that case, both the watermark and the state can be the same. Some possible examples are described in the previous paragraphs.

Watermarks from different printing phases together in one map

The next special feature we want to discuss concerns the presence of two watermarks clearly belonging to paper used during the first and second printing phase together in one map. A remainder of

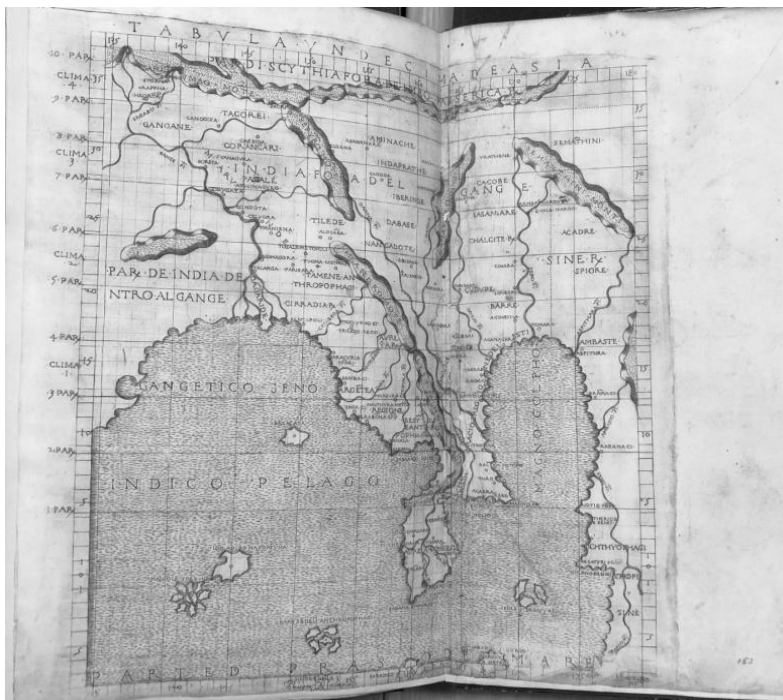


Fig. 718

the paper from the first printing phase was used up during the second printing phase and got mixed up with paper belonging to this second printing phase. An example is the map *TABVLA VNDECIMA DE ASIA* which contains the watermarks shearer scissors, belonging to the first type of maps, combined with the watermark three mountains in a circle with a cross on top, characteristic for the second type of maps (see table four).⁵² This is supported by the print quality of the two halves and the exact transition of plate tone from one half to the other, which rule out any doubt that this map is composed of two halves of different maps (Fig. 718). It also supports the hypothesis put forward in the

⁵¹ Biblioteca Apostolica Vaticana, shelfmark Stamp.Ferr.S.37.

⁵² British Library, shelfmark C.1.d.1.

⁵³ Biblioteca del Seminario arcivescovile maggiore, shelfmark D III 56.

the watermark crossbow in a circle and the letter P was found (see table four). The overall very identical quality of the impression as well as the exact continuation of the plate tone found in the margins of both halves of this map again rule out a later composition of two separate halves.

The Alessandrina copy: a case study

A very interesting specimen of the *Geography* is kept in Rome. This so-called Alessandrina copy was described by Tauci, with information from the records found in the registers of the Convento della SS. Annunziata.⁵⁴ Based on his research, it can be ascertained that this copy was illuminated and coloured in 1486. According to the registers in 1485, a copy of the *Geography* was ordered from Berlinghieri. On December 19, 1485, the first payment of four gold florins was made by Michele, chamberlain of the *generale*, by order of Antonio da Bologna the successor as *generale*, to Giustinopoli.⁵⁵ On June 23, 1486, Berlinghieri was paid another ten gold florins, followed by an additional payment of fourteen gold florins on October 16, later that year. The miniaturist Bartolomeo di Pagolo was paid two gold florins on July 3, 1486, for painting and illuminating this copy of the *Geography*. Finally, on November 11, 1486, bookings were found of seventeen lire for an iron chain or bookcase, six lire for the binding, and seven lire fifteen soldi for a leather cover.⁵⁶ Together this is another five to six florins. The total costs of this copy, including the illumination, colouring, binding, and cover have amounted about 36 florins.⁵⁷ Based on the presence of the motto DA GLORIAM DEO on the frontispiece, the author assumed that it was destined for Cristoforo di Giustinopoli, Generale dei Servi di Maria, although he already died on June 17, 1485 (Fig. 719). According to Tauci, Giustinopoli may have made unrecorded payments before his death, which leaves doubt about the total amount paid to Berlinghieri. From the dates related to the payments, it could be deduced that his successor Antonio da Bologna was the actual commissioner. This could well imply that the noted payments are complete and that the first payment of 4 florins to Berlinghieri was for a printed uncoloured and not illuminated copy of his *Geography*. This sum seems quite plausible. Azzini described a notarial deed with the information that the last copies of the Bologna 1477 edition of the *Cosmography* could be sold for one and a half ducats per volume after the investment had been earned back.⁵⁸ According to us, an initial price of two to two and a half ducats seems plausible. The 1477 edition contained about 115 leaves of paper and 26 engraved maps; Berlinghieri's *Geography* contained about 160 leaves and 31 engraved maps on 30 copper plates. Therefore, the first payment of four florins to Berlinghieri could have referred to a printed copy of his *Geography*.

The text of the Alessandrina copy is sparingly illuminated, in contrast to the maps which are extensively coloured with a deep blue colour based on the pigment lapis lazuli for the rendition of the seas (Fig. 720). Only a further embellishment like a heightening with gold was omitted. That explains the much higher payment to Berlinghieri, who will have arranged the colouring of the maps, compared to the payment to Di Pagolo for the illumination of the text. Based on the dates of the payments it cannot exactly be determined at which time the colouring and illumination was started. It is plausible that it must have been after the first payment. In that case, a production period of at least one year seems credible. If Giustinopoli would have been the customer and unrecorded payments would have taken

⁵⁴ Biblioteca Universitaria Alessandrina, shelfmark Inc.541; Raphaele Tauci, 'La geografia del Berlinghieri della Biblioteca Alessandrina di Roma', *La Bibliofilia*, 69, (1967), pp. 69-73.

⁵⁵ Tauci, op. cit. (n. 54), p. 70; Fiorini quattro larghi d'oro in oro, due in grossi.

⁵⁶ Op. cit. (n. 54), p. 72; We could not deduce from Tauci's text whether it concerned an iron case for the book or a chain to fasten the book to a desk or bookshelf to prevent theft as was applied in those days described by King, op. cit. (n. 37), p. 117.

⁵⁷ Eleonora Azzini, 'Domizio Calderini e la recognitio tabularum Ptolemaei', *Tesi di Dottorato in Archivistica, Bibliografia e Biblioteconomia Università degli studi di Firenze*, M-STO/08 (2010), pp. 9, 112; Around 1457-1459 an envoy of the bookseller Vespasiano da Bisticci sold a *Cosmography* of Ptolemy *cholla pictura bellissima* for 50 ducats to the king of Aragon. That must have been a manuscript on parchment. More expensive examples of prices paid for manuscripts of the *Cosmography* of 100 florins and 206 ducats are mentioned also in this thesis; Op. cit. (n. 37), pp. 267-68, 298, King describes in his book that the average price for a manuscript provided by Vespasiano da Bisticci for a library of Cosimo de Medici was 14 florins and that the two most expensive ones cost 37 and 39 florins. The price of the most luxurious large-format manuscripts from Vespasiano for Cardinal Bessarion was almost 50 florins each. A price of 100 florins for a manuscript mentioned by Cardinal Bussi is described in this book; The price of 36 florins for a copy of the *Geography*, of which the maps are extensively coloured using very expensive ground lapis lazuli but of which the text is only marginally illuminated, printed on paper instead of written on parchment seems to be realistic. That would also indicate that the payments found in the archives described by Tauci would be complete.

⁵⁸ Azzini, op. cit. (n. 57), p. 64.

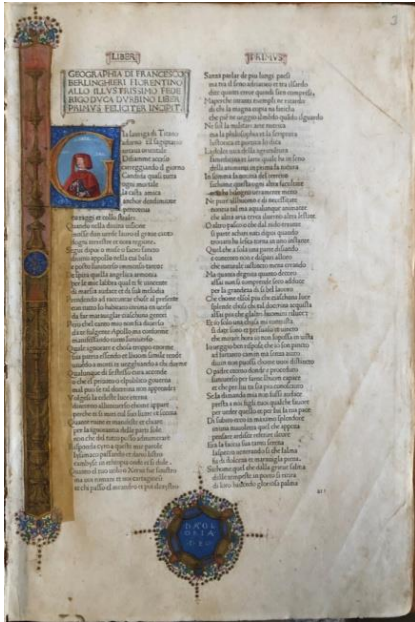


Fig. 719



Fig. 720



Fig. 721



Fig. 722

place, then at least half a year and possibly more must be added to the production period. This was deducted from the payments recorded in the registers according to Taucci's article. The amount may have been even higher if there were indeed unlisted payments.

Our research has uncovered interesting new facts concerning the Alessandrina copy. First, the maps of this specimen are among the earliest printed of the first type, based on the watermarks found in the maps and the early state of the maps. Second, in the backing of the maps several watermarks were found which are identical to the ones found in the Turin copy (see table four and five).⁵⁹ The letter from Berlinghieri to Cem, son of Sultan Mehmed II, dated May 31, 1484 dates this atlas with quite absolute certainty (Fig. 716). This copy was illuminated and coloured more extensively and was gold heightened (Fig. 721-22). It must have been more laborious compared to Giustinopoli's copy.⁶⁰ Based on the above, a production time of one to one and a half year is plausible for Cem's atlas. This implies it should have

⁵⁹ Biblioteca Nazionale Universitaria di Torino, shelfmark XV.I.42.

⁶⁰ This atlas was illuminated much more extensively compared to Giustinopoli's copy and gold was applied for the margins of the maps. So, it must have been a considerably more expensive one in any case more than fifty florins.

been printed by the end of 1482. It confirms our other findings regarding the printing of the text and the maps of the *Geography*. Another interesting conclusion that can be drawn from the state of the maps and the watermarks found in the paper of the maps and their backings, is that the Alessandrina copy could not possibly have been printed and backed in 1486. Maps and backings belong to the first edition and even the first printing phase. Therefore, the maps in this atlas must have been backed immediately following printing in 1482. The registers of the convent prove that the maps were coloured four years later. From this can be deduced that Berlinghieri himself must have had some stock of sets of text and maps printed with the extra attention and care for later orders from high-end customers. This copy was sold and coloured in 1486. It would be very coincidental if this had been the last specimen from this stock.

The presence of left-over stock is supported by a find in London. An unmistakable Giunti copy was studied, which to our great surprise contained two uncoloured but backed maps.⁶¹ It concerned the world map and the map *TABVLA SEXTA D EVROPA*. In the backing of the map *TABVLA SEXTA D EVROPA* the watermark cardinal's hat type 1d was found (see table four).⁶² Moreover, further examination revealed that they were both in the first state and that the watermark cardinal's hat was present in the maps. They are the best example of first edition maps of the first type in second edition atlases by Giunti. From these findings we conclude that Giunti not only took over the sets of text and the copper plates for the printing of the maps, but apparently also a remainder of the earliest and most carefully printed maps. The earlier in this chapter described examples of first edition maps belonging to the first and second printing phase by Tedesco in Giunti copies provide further confirmation. During the first printing phase only a small number of sets of maps was printed. Most of them ended up in the most expensive illuminated and coloured copies for high-ranking persons. Only six world maps were found in the first state in exclusively these copies. The seventh one, neither coloured nor illuminated, was detected in a Giunti atlas belonging to the second edition.⁶³

Concluding remarks

With the information provided in the previous chapters combined with the supplementary notes about the atlases in this chapter, almost all features found on the maps and in the different copies can be explained. Only a few specimens remain that are difficult to be interpreted. In summary, we found the atlases studied in many different compositions. Nevertheless, taking everything into account it must be concluded that three main versions of the *Geography* exist. The occurrence of exceptions to the rule, created by restorations over the centuries, and those that can be traced back to the production process and to stock management, must be taken into consideration.

⁶¹ Royal Geographical Society, shelfmark CA15F-001.

⁶² Two more uncoloured maps were detected in a private collection. Both were backed with a second sheet of paper. In the map *TABVLA SECONDA DE ASIA* the watermark cardinal's hat type 1c and in its backing the watermark crescent with rays and a cross on top, as found in the earliest printed, coloured, and illuminated maps was present (Fig. 329-30, 546). In the map *TABVLA OCTAVA D ASIA*, also in the first state, the watermark cardinal's hat type 1d was detected. In the backing no watermark was found. Thus, two more examples of the earliest possible and rarest maps, but not illuminated nor coloured, were discovered (Fig. 504). From a statistical point of view, it must be almost impossible to come across such maps. They must have been bound in one or more atlases which were later dismantled and thus became available as individual maps.

⁶³ An eighth world map in the first state uncoloured and backed is a map in a private collection (Fig. 497). This map does not even seem to have the liber indication, which makes it an example of one the earliest maps printed maps of the first edition during the first printing phase. This is further confirmed by the watermarks. The watermark cardinal's hat type 1c is present in the map and the watermark a crescent with rays and a cross on top in the backing as in the most prestigious copies (Fig. 222, 286). It is difficult to draw any further conclusions because we have found it as an individual map. However, these findings strongly point out that this must also have been an unsold map from Berlinghieri's original stock. It is very likely that more examples of the world map in the earliest state can be discovered in copies as the ones in Istanbul, Arezzo, and Paris described earlier in this chapter.

The three types of atlases

First Edition first printing phase

City	Florence
Library	Biblioteca Medicea Laurenziana
Shelfmark	Inc.I.5
Binding	modern
Collation	mostly correct, some maps misplaced
Fly leaves	five later four, wove paper, same as end leaves
Frontispiece	one, watermark sun with a B on top, about 1790-1820 missing
Interleaves	all present, contemporary three, watermark cardinal's hat type 1 one without watermark two additional interleaves placed in front of the maps Asia 8 and Asia 9, one without watermark, one with watermark crossbow in a circle, added in workshop or by bookbinder
Text	watermarks cardinal's hat, ox
Maps	Europe 9, Europe 10, Asia 1, Asia 4, Asia 5, Asia 6, Asia 7 and Asia 10 missing watermarks cardinal's hat, shearer scissors
Backing	present on all maps, watermark cardinal's hat
Register and colophon	not present
End leaves	four later, wove paper same as fly leaves
Illumination	on the page with the dedication to Federico, around the text, bronze coloured friezes illuminated with weapons, shields and armour, in a purple colour on top of the fries in the middle, two lying cherubs at the bottom of the page, on a pedestal underneath the fries and the text, two standing cherubs, in front of the left and right column of the fries, next to the text in the front of each pedestal, a silver portrait facing the other first capital, a historiated initial in gold, the figure of Berlinghieri, dressed in a red cassock, a cap on his head, disengaged from the perspective of a study, working at a desk heading at the beginning of each Liber illuminated with banner inhabited initial in gold at the beginning of each liber, surrounded by a floral design, gold heightened guide letters enlarged, coloured blue
Colouring of maps	world map, only map exclusively framed with a golden rim, sea dark blue colouring lapis lazuli, mountains greyish-brown, a more aqueous colour, waves painted around the image of the map in a light blue, the wind-faces in a dark blue aqueous colour titles of regional maps, mostly letters in gold on a green or red background with banner at both sides, except when title is engraved inside, instead of above the map map framed with red or green rim at the inside, golden rim at the outside, sea and rivers, dark blue colouring, lapis lazuli, other applied colours more aqueous, forests green, mountains yellow brown, circles representing places extended with buildings red or uncoloured, historic monuments pink
Special observations	copy destined for Lorenzo de Medici one of three copies found with the map Europe 5 in the second state,

with ERVPA in the title, instead of EVROPA, as found in the first state, or EVROPA, with a combination of the letters O and V in the O, as found in the third state, although less visible because of the colouring and gold heightening applied in this copy
in the map Africa 3, a combination of two watermarks cardinal's hat and shearer scissors

City	Turin
Library	Biblioteca Nazionale Universitaria di Torino
Shelfmark	XV.I.42
Binding	later, parchment
Collation	mostly correct, one modern map misplaced
Fly leaves	one, watermark sun with countermark about 1790-1820 same as end leaf
Frontispiece	title in black, adapted and illuminated
Interleaves	all present, contemporary one, watermark cardinal's hat type 4 three, without watermark two additional interleaves placed in front of the maps Asia 8 and 9, both watermark lily in a circle, added in workshop or by bookbinder
Text	one missing leaf watermarks cardinal's hat, ox
Maps	watermarks cardinal's hat type 1, shearer scissors
Backing	present on all maps, watermarks scissors, crescent with rays and a cross on top Asia 12 watermark sun with countermark same as fly and end leaf
Register and colophon	not present
End leaves	one, watermark sun with countermark about 1790-1820 same as fly leaf
Illumination	on the leaf with the frontispiece, on the verso, the dedication in the title is adapted to Genma (with a n instead of a m) Sultan, in golden letters on a dark red background, in a green laurel wreath with curved ribbons above the title, a green cartouche, added later when the volume came into the hands of Filiberto Pingone, with the inscription in golden letters on a red background, Ptolemy Italicus Byzantio advectus e principum Bibliothecis ad Pingonianam tandem ex empto pervenit on the page with the dedication, text adapted again to Genma Sultan, in golden letters, in a cartouche with the same dark red background as applied to the title around the text, a frame with a golden border on the inside and outside in between, an oriental design in predominantly red, blue and bronze colours at the right side of the text, in the centre of the frame, in the middle of the page, a golden encircled miniature with a dragon and a lion in the center, at the bottom of the page, instead of a coat of arms of the person for whom it was intended as usual, an Ottoman symbol in a golden circle, on a blue coloured background first capital, historiated initial in gold, an elegant and refined Florentine look inside inhabited initials in gold at the beginning of most libers, surrounded by a floral design, gold heightened
Colouring of maps	guide letters enlarged, coloured blue, in the first part of the text only world map, only map exclusively framed with a golden rim, sea dark blue colouring lapis lazuli, mountains greyish-brown, a more aqueous

Special observations	<p>colour, waves painted around the image of the map in a light blue, the wind-faces in a dark blue aqueous colour</p> <p>titles of regional maps, mostly letters in gold on a green or red background, with banner at both sides, except when title is engraved inside, instead of above the map</p> <p>map framed with rim in red and green at the outside, golden rim at the inside, sea and rivers dark blue colouring, lapis lazuli, other applied colours more aqueous, forests green, mountains yellow brown, historic monuments pink or uncoloured, names of larger regions red or blue</p> <p>copy destined for Cem son of Sultan Mehmed II following title page, a parchment sheet is inserted with on the recto a commission from Filiberto Pingone Baron of Cusy (1525-1582) to Duke Emanuele Filiberto of Savoy, who received it as a gift from Pingone himself</p> <p>the copy remained in the library from the house of Savoy until 1723, then it moved to the library in Turin in the Via Po</p> <p>on the verso, a manuscript letter on parchment to Cem, probably by Berlinghieri, dated May 31, 1484, Florence beneath the letter a depiction of the coat of arms of Filiberto Pingone with personal devise</p> <p>on the map Europe 6 the title SEXTA D EVROPA was present, printed as well as illuminated in golden letters, without marks of the previously erroneously engraved ASIA</p> <p>on the map Europe 9 the title NONA DE ASIA was present, printed as well as illuminated in golden letters</p> <p>in the map Africa 1, in both halves of the map the watermark cardinal's hat was found</p> <p>the additional interleaves in front of the maps Asia 8 and 9 were bonded together and present in front of the map Asia 9 paper trimmed in the margin of some maps during rebinding</p>
City	Rome
Library	Biblioteca Universitaria Alessandrina
Shelfmark	Inc.541
Binding	later, re-bound about 1890
Collation	incorrect
Fly leaves	two later, wove paper
Frontispiece	title in black, illuminated
Interleaves	all present, contemporary
	one, watermark cardinal's hat type 1
	three, without watermark
	two additional interleaves placed in front of the maps Asia 8, watermark lily in a circle and 9, without watermark, added in workshop or by bookbinder
Text	watermark cardinal's hat
Maps	watermarks cardinal's hat types 1 and 5, shearer scissors
Backing	present on all maps, watermarks scissors, lily in a circle, shearer scissors, cardinal's hat type 8
Register and colophon	not present
End leaves	?
Illumination	<p>executed by Bartolomeo di Pagolo di Filippo, born in Florence in 1457, deceased on March 4, 1530</p> <p>frontispiece, thin circle painted around text in gold yellow colour four small "flowers" on the circle in the same colour</p>

	<p>on the page with the dedication to Federico, in the left margin, a ribbon with candelabra in purple, at the top and bottom of the ribbon, a floral design, coloured, gold heightened</p> <p>in the center, at the bottom of the page, instead of a coat of arms of the person for whom it was intended as usual, a blue coloured circle with the motto, in capital letters: DA GLORIAM DEO, a ribbon fluttering inside the circle, the circle surrounded by a coloured floral design, gold heightened</p> <p>first capital, historiated initial in gold, the figure of Berlinghieri, dressed in red cassock, with the <i>Geography</i> in his hand</p> <p>guide letters enlarged, coloured blue</p>
Colouring of maps	<p>world map, only map framed with a gold coloured rim, sea dark blue colouring lapis lazuli, mountains greyish-brown, a more aqueous colour, waves painted around the image of the map in a light blue, the wind-faces in a dark blue aqueous colour titles of regional maps, mostly white painted letters on a green or red background with banner at both sides, except when title is engraved inside, instead of above the map</p> <p>map framed with rim in red and green at the outside, a gold coloured rim at the inside, sea and rivers dark blue colouring, lapis lazuli, other applied colours more aqueous, forests green, mountains yellow brown, circles representing places yellow gold, historic monuments purple or grey black</p>
Special observations	<p>not all rims consistently coloured</p> <p>copy destined for Christoforo di Giustinopoli, General of the Order of the Servants of Mary</p> <p>each general had his own motto, Giustinopoli's one was DA GLORIAM DEO</p> <p>illuminated and coloured in the years 1485-1486 by Bartolomeo di Pagolo di Filippo (1457-1530), based on notes found in the archives of the Order of the Servants of Mary with regard to payments made to Berlinghieri, as well as Bartolomeo</p> <p>most maps in the first state, printed on the earliest applied paper, based on the watermarks</p> <p>same watermarks in backing of maps as in other copies for high-ranking persons, thus printed and backed during the first printing phase in 1482, although colouring and illumination was applied three years later</p> <p>on the map Europe 6 the title SEXTA D EVROPA was present, in printed as well as painted letters, without marks of the previously erroneously engraved ASIA</p> <p>LVROPA painted on Europe 7, instead of EVROPA on the map Europe 9 the title NONA DE ASIA was present, in printed as well as painted letters</p> <p>maps Europe 8, Asia 5 with traces of flattening the backed sheet with a stone after gluing</p> <p>paper trimmed in the margin of some maps during rebinding</p>
City	Rome
Library	Biblioteca Nazionale Centrale di Roma
Shelfmark	70.1.G.5
Binding	later, nineteenth century
Collation	incorrect
Fly leaves	several later,

	followed by three contemporary leaves, one without watermark, two watermark shearer scissors
Frontispiece	missing
Interleaves	all present, contemporary two, watermark cardinal's hat type 1 two, without watermark two additional interleaves placed in front of the maps Asia 8, without watermark and 9, watermark comet, added in workshop or by bookbinder
Text	watermarks cardinal's hat, ox
Maps	watermarks cardinal's hat type 1, lily in a circle
Backing	present on all maps, watermarks cardinal's hat types 1 and 5, crescent with rays and a cross on top
Register and colophon	not present
End leaves	two later
Illumination	on the page with the dedication to Federico, the dedication in golden letters, in a cartouche with a red background around the text, a frame with a golden border on the inside and the outside in between, a floral design in all kinds of colours in the left lower corner in the center of the frame, a miniature, Berlinghieri studying a globe, in oval with a golden rim at the right side, top to bottom three miniatures, the first two in a golden circle, the upper one, two persons in a landscape Berlinghieri in discussion with Ficino, a city in the background, the middle one, Berlinghieri studying a map, the third and lowest miniature, placed in a bronze painted circle, a cherub above, three persons in conversation on a cloud, in the middle Ptolemy with an oriental headdress in the center, at the bottom of the page, the coat of arms of the Pucci family on a blue back ground within two golden circles, cherubs on both sides first capital, historiated initial in gold, the figure of Berlinghieri, dressed in a red cassock, a cap on his head, disengaged from the perspective of a study, working on a map with a textbook in his hand heading at the beginning of each liber in a simple cartouche with banner at both sides guide letters enlarged, coloured blue all five miniatures very similar to those of the manuscript in the Braidense Library in Milan identity of the persons in the miniatures regularly depends on who the copy is intended for, therefore, the neutral word person is used here, to avoid discussion
Colouring of maps	world map, only map framed with a yellow gold coloured rim, sea dark blue colouring lapis lazuli, mountains yellow brown a more aqueous colour, the red sea red, the zodiac orange brown, waves painted around the image of the map in a light blue, the wind-faces in a dark blue aqueous colour titles of regional maps, mostly yellow painted letters on a green background with banner at both sides, except when title is engraved inside, instead of above the map map framed with rim in red and green at the outside and a "golden" coloured rim at the inside, sea and rivers dark blue colouring, lapis lazuli, other applied colours more aqueous, forests green, mountains

Special observations	<p>yellow brown, circles representing places and extended with buildings, yellow, red or green, by exception uncoloured, historic monuments pink copy of the Pucci family</p> <p>a note in handwriting at the bottom of the illuminated leaf with the dedication to Federico, ex libris de Corsellinis 1591 referring to Tiberio Corsellini, a monk from Vallombrosa⁶⁴</p> <p>another ex libris at the inside of the book cover, dated 1792, referring to Cardinal Valenti Gonzaga whose books ended up in the Casa Professa dei Gesuiti and from there in the Biblioteca Nazionale Centrale di Roma⁶⁵</p> <p>lots of handwritten notes, late sixteenth century, on text pages</p> <p>on the map Europe 6 the title SEXTA D EVROPA was present, printed and painted, without marks of the previously erroneously engraved ASIA</p> <p>on the map Europe 9 the title NONA D EVROPA was present, printed and painted, without marks of the previously erroneously engraved ASIA</p> <p>LVROPA painted on Europe 10, instead of EVROPA last letters in title on Asia 5 uncoloured</p>
City	Florence
Library	Biblioteca dell'Accademia della Crusca ⁶⁶
Shelfmark	Inc. 34
Binding	about 1870-1880
Collation	correct
Fly leaves	one late nineteenth century
Frontispiece	title in black, illuminated
Interleaves	<p>two present, contemporary</p> <p>two additional interleaves placed in front of the maps Asia 8, and 9 added in workshop or by bookbinder</p>
Text	?
Maps	?
Backing	watermarks lily in a circle, cardinal's hat 1 type 1
Register and colophon	not present
End leaves	one late nineteenth century
Illumination	<p>frontispiece, thin circle painted around text in gold yellow colour, four small "flowers" on the circle in the same colour</p> <p>on the page with the dedication to Federico, in the left margin, at the left from the historiated capital, a floral design, coloured, gold heightened</p> <p>first capital, historiated initial in gold, the figure of Berlinghieri, dressed in a red cassock, a cap on his head, disengaged from the perspective of a study, working on a map with a textbook in his hand</p> <p>in the center, at the bottom of the page, a coat of arms of the person for whom it was intended as usual, two gold heightened circles with a light blue colour in between, inside the inner circle a gold coloured or heightened shield on a dark red background, the outer circle surrounded by a gold heightened floral design</p>

⁶⁴ Paolo Veneziani, 'Vicende tipografiche della *Geografia* di Francesco Berlinghieri', *La Bibliofilia*, 84, (1982), pp. 195-208.

⁶⁵ Veneziani, op. cit. (n. 64).

⁶⁶ This atlas can be fully studied digitally on the internet, in the backing of some maps the watermark could be recognized: <http://incunaboli.accademiadellacrusca.org/theke/schedaimmagine2.asp?es=o&radice=000189809>

	<p>heading and headers at the beginning of liber primus in a simple cartouche with banner at both sides</p> <p>inhabited initials in gold at the beginning of all other libers, surrounded by a floral design, gold heightened</p> <p>guide letters enlarged, coloured blue</p>
Colouring of maps	<p>world map, only map framed with a gold coloured rim, sea dark blue colouring lapis lazuli, mountains greyish-brown, a more aqueous colour, waves painted around the image of the map in a light blue, the wind-faces in a dark blue aqueous colour titles of regional maps, mostly white painted letters on a bronze coloured background with banner at both sides, except when title is engraved inside, instead of above the map</p> <p>map framed with rim in red and green at the outside, a gold coloured rim at the inside, sea and rivers dark blue colouring, lapis lazuli, other applied colours more aqueous, forests green, mountains yellow brown, circles representing places yellow gold, historic monuments yellow brown or rose red</p>
Special observations	<p>most maps in the first state</p> <p>same watermarks in backing of maps as in other copies for high-ranking persons, thus printed and backed during the first printing phase in 1482 on the map Europe 6 the title SEXTA D EVROPA was present, in printed as well as painted letters, without marks of the previously erroneously engraved ASIA</p> <p>on the map Europe 9 the title NONA DE ASIA was present, in printed as well as painted letters</p>
City	Amsterdam
Library	Scheepvaartmuseum
Shelfmark	Me 0376
Binding	elaborate, nineteenth century
Collation	mostly correct
Fly leaves	<p>eight later,</p> <p>six watermark windmill about 1890, as end leaves</p> <p>one watermark fish William Morris about 1890, as end leaf</p> <p>one contemporary, without watermark</p>
Frontispiece	missing
Interleaves	<p>five present, contemporary</p> <p>two, watermark cardinal's hat type 1</p> <p>one, without watermark</p> <p>one, missing</p> <p>two additional interleaves following map Africa 4, watermark crown in a circle, and at the position of the last interleaf, watermark lily in a circle, the same watermarks as applied to the backing of the maps of this atlas only, added in workshop or by bookbinder, originally in front of maps Asia 8 and 9, wrongly inserted during later rebinding</p>
Text	watermarks cardinal's hat, ox
Maps	watermark cardinal's hat type 5
Backing	present on all maps, watermarks, lily in a circle, siren, crown in a circle
Register and colophon	not present
End leaves	<p>seven later</p> <p>one, watermark fish from William Morris about 1890, same as fly leaf</p> <p>six watermark windmill about 1890, same as fly leaves</p>
Illumination	not applied

Colouring of maps	all applied colours aqueous world map, sea blue, mountains grey green, letters continents red regional maps, sea lakes and rivers blue, islands, and mountain greenish yellow, margins with latitudes and longitudes red
Special observations	watermark cardinal's hat type 5 in maps, further only found in a few maps of the Inc.541 copy and in the backing of one map in the 70.1.G.5 copy both present in libraries in Rome type of colouring applied to maps not found in any other copy, the blue colour on many maps discoloured green on the map Europe 6 the title SEXTA D EVROPA was printed, without marks of the previously erroneously engraved ASIA on the map Europe 9 the title NONA D EVROPA was printed, without marks of the previously erroneously engraved ASIA type of watermarks present in backing not found in any other copy, probably added by workshop watermark crown in a circle found in backing, exactly the same watermark as present in several copies of the 1490 Rome <i>Cosmography</i> edition paper trimmed during rebinding from the collection of Cardinal Altemps, later collection Anton Mensink
City	Naples
Library	Biblioteca Nazionale Vittorio Emanuele III
Shelfmark	S.Q.X.K.15
Binding	later
Collation	no information available
Fly leaves	no information available
Frontispiece	title in black, heavily restored and backed with later paper
Interleaves	no information available
Text	first twenty leaves missing including the one with the devices of its owner ⁶⁷ watermark cardinal's hat, no information available about possible presence of other watermarks
Maps	world map missing, no information if more maps are missing watermark cardinal's hat in three maps found, no information available about possible presence of other watermarks
Backing	probably present on all maps, watermarks, scissors, lily in a circle, crescent with rays and probably a cross on top
Register and colophon	no information available
End leaves	no information available
Illumination	illuminated incipits for each Liber present ⁶⁸
Colouring of maps	all applied colours aqueous titles of regional maps, mostly on a mainly or completely uncoloured background, with banner at both sides, in case of colouring a few light blue spots were applied for the background, margins with latitudes and longitudes green and red, sea and rivers blue, forests green, mountains yellow brown, circles representing places red on some maps ground bronze found on mountains

⁶⁷ Roberts, op. cit. (n. 28), *Cartography between cultures: Francesco Berlinghieri's Geographia of 1482*, p. 134.

⁶⁸ Ibid, p. 133.

Special observations	<p>indications present that the copy might have been intended for or in possession of Ferdinand I, King of Naples and Sicily, or Alfonso of Calabria⁶⁹</p> <p>images available about text leaves including watermarks, images from eight maps without watermark and six backings with watermark further information received by e-mail</p> <p>most maps present in the first state</p> <p>only copy found with the map Asia 3 in the second state</p> <p>the combination of the information about the watermarks in the maps, combined with the images of the watermarks in the backing, the type of colouring of the maps and the illumination of the text pages, the atlas must have been one of the very first copies, richly illuminated and coloured, intended for high-ranking persons</p> <p>paper trimmed in the margin of some maps during rebinding</p>
City	Florence
Library	Biblioteca Nazionale Centrale di Firenze
Shelfmark	Magl. Inc. N_20
Binding	later, blue marbled cardboard with brown leather spine, eighteenth or nineteenth century
Collation	correct
Fly leaves	one later, no watermark, wove paper
Frontispiece	title in black
Interleaves	<p>three present, contemporary</p> <p>one, watermark cardinal's hat type 1</p> <p>two, without watermark</p> <p>one missing</p>
Text	watermark cardinal's hat
Maps	<p>watermarks shearer scissors, cardinal's hat in the richly coloured maps, three mountains in a circle with a cross on top in a partially coloured map</p>
Backing	present on all maps, watermarks crowned eagle in the richly coloured maps, anchor in a circle in the partially or uncoloured maps
Register and colophon	not present
End leaves	one later, no watermark, wove paper
Illumination	<p>on the page with the dedication to Federico, inhabited initial in gold surrounded by a floral design</p> <p>in the center at the bottom of the page the naked torso of an older man with a grey beard and hair encircled with green and purple leaves, petioles, and roots, underneath the coat of arms of the Colonna family, a greyish column in a gold heightened shield with a green border, a brown bear behind the column a chain around his neck attached to the column, a black crowned eagle the wings spread on top of the column</p>
Colouring of maps	<p>all applied colours aqueous</p> <p>world map, sea blue, red sea red, rivers and lakes black, mountains brown, islands on the left half of the map brown on the right half yellow green, names of the oceans and boundaries red</p> <p>regional maps, rim with longitudes and latitudes around map pink, sea blue, rivers and lakes green, mountains brown, forests green, islands uncoloured or yellow green, names of the oceans and boundaries red, circles of places uncoloured, red or black, historical symbols red</p>

⁶⁹ Ibid, pp. 133-34.

	a second type of regional map was present uncoloured or partially coloured, rim with longitudes and latitudes around map vaguely yellow, the sea green, forests green
Special observations	this atlas clearly was composed of two different types of maps based on the different type of watermarks found in the maps as well as the backing of both types of maps, the different applied colouring and the different size of the paper of the two types of maps, the richly coloured ones are a bit shorter compared to the partially coloured ones and the text leaves copy of the Collonna family
City	London
Library	National Maritime Museum
Shelfmark	PBD 7690
Binding	later, parchment eighteenth century
Collation	incorrect, first the text leaves followed by the maps
Fly leaves	one later, watermark three mountains Barberini, eighteenth century, same as end leaf
Frontispiece	missing, added in facsimile with title in red and black on wove paper
Interleaves	all missing
Text	missing text leaves added, other paper size watermarks cardinal's hat, ox
Maps	missing maps completed watermarks original maps, shearer scissors, cardinal's hat type 1, crossbow in a circle watermarks added maps, boat, anchor in a circle with a star on top type 3, crescent in a circle with a cross on top
Backing	present on all original maps, watermarks column, crescent, cardinal's hat types 1 and 6 not present on the six second edition maps added later
Register and colophon	not present, as indicated in copy, a leaf from another copy was added, watermark cardinal's hat type 4
End leaves	one later, watermark three mountains Barberini, eighteenth century
Illumination	on the page with the dedication to Federico, first capital, inhabited initial in gold, surrounded by a floral design, gold heightened at the bottom of the page in a wreath, coat of arms, red bull on left half of a shield, black tassels of a cardinal's hat on both sides of the shield, surrounded by a floral design, gold heightened underneath wreath, ribbon in red guide letters enlarged, coloured blue
Colouring of maps	not applied
Special observations	frontispiece added in facsimile notes in different handwriting on text pages, the oldest sixteenth century some text leaves, in different size, added from another copy PROOF PRINTS found of the maps Europe 3 modern, Europe 6 and Africa 4 one of three copies found with the map Europe 5 in the second state, with ERVPA in the title, instead of EVROPA, as found in the first state, or EVROPA with a combination of the letters O and V in the O, as found in the third state PROOF PRINT EUROPE 6, ONLY EXAMPLE FOUND WITH THE ERRONEOUSLY ENGRAVED DE ASIA

on the map Europe 9 the title NONA D EVARSOPA was printed, a combination of EVROPA and the previously erroneously engraved ASIA first copy with a lot of maps, belonging to the first printing phase, found in the definitive state

variant of the watermark cardinal's hat type 6 found in the backing, exactly the same watermark as present in several copies of the 1490 Rome *Cosmography* edition

in the map Asia 1, in both halves of the map the watermark cardinal's hat was found

bonding of the maps discoloured

maps from the first printing phase, in the first state, backed, but uncoloured

six second edition maps added Europe 3, Europe 6 modern, Asia 4 modern, Asia 5, second half of Asia 11, Asia 12, based on the watermarks and paper size

leaf with register and colophon, added from another copy

paper of added maps trimmed

City	Barcelona
Library	Biblioteca de Catalunya
Shelfmark	Inc. 47-Fol.
Binding	modern parchment
Collation	correct
Fly leaves	two modern, two, watermark three mountains with a cross on top and letters at the left and countermark crown with star and moon on top, Italian paper seventeenth or eighteenth century, same as end leaf
Frontispiece	title in black, illuminated
Interleaves	two present, contemporary two, watermark cardinal's hat two, missing
Text	two leaves missing, including first leaf with the dedication to Federico, possibly with the illumination in relation to the owner of the copy watermark cardinal's hat, no other watermarks detected
Maps	only two maps present Europe 2, Europe 2 moderna, watermarks in paper of the maps not visible
Backing	present on both maps, watermarks scissors, crescent with rays and a cross on top
Register and colophon	not present
End leaves	two modern, two, watermark three mountains with a cross on top and letters at the left and countermark crown with star and moon on top, Italian paper seventeenth or eighteenth century, same as end leaf
Illumination	frontispiece, thin circle painted around text in blue at the beginning of each liber, heading in a simple cartouche with banner at both sides, up to and including Liber Quintus, except for Liber Secundus first capital, inhabited initial in gold, up to and including Liber Quintus guide letters enlarged, coloured blue, up to and including Liber Quintus, not always consistently applied
Colouring of maps	not applied
Special observations	digital version of the atlas, studied by a high-resolution download watermarks quite often visible and recognisable maps from the first printing phase, in the first state backed, but uncoloured

First Edition second printing phase

City	Florence
Library	Biblioteca Marucelliana
Shelfmark	R.A.788
Binding	later, parchment eighteenth century
Collation	mostly correct, one modern map misplaced
Fly leaves	one later, without watermark, same as end leaf
Frontispiece	title in black
Interleaves	all present, contemporary one, watermark cardinal's hat type 4 three, without watermark
Text	watermark cardinal's hat
Maps	Asia 2 missing, added in facsimile watermarks shearer scissors, cardinal's hat types 1, 7 and 8, lily, three mountains in a circle with a cross on top, P
Backing	present on all maps, watermarks anchor in a circle with a star on top type 1, Greek cross in a circle
Register and colophon	not present
End leaves	one later, without watermark, same as fly leaf
Illumination	not applied
Colouring of maps	all applied colours aqueous world map, sea green, red sea pink-red, lakes grey black, mountains yellow brown, wind-faces pink regional maps, sea green, red sea Africa 4 pink red, lakes Africa 4 grey black, forests green, mountains yellow brown, monuments coloured pink red on all maps, partially and diffuse pink colouring present, on some maps combined with partially and diffuse yellow colouring
Special observations	maps from first and second printing phase present together in this copy Europe 4, Europe 5 and Europe 8 evidently belong to the first printing phase, based on the state and watermark one of three copies found with the map Europe 5 in the second state, with ERVPA in the title, instead of EVROPA, as found in the first state, or EVROPA with a combination of the letters O and V in the O, as found in the third state watermark lily, exclusively found in the map Europe 7 and only in this copy Asia 2 missing, added in facsimile watermark cardinal's hat type 8, exclusively found in the map Asia 12 and only in this copy paper trimmed in the margin of some maps during rebinding
City	Vatican City
Library	Biblioteca Apostolica Vaticana
Shelfmark	Stamp.Ferr.S.37
Binding	allegedly contemporary leather binding on wood, two threads delimit a frame decorated with interwoven rope tiles inside, another frame, decorated with dry embossed knots, encloses two concentric-framed rectangles with stylized floral motifs, knots and woven ropes, in the center of the plate a lozenge decorated with motifs embossed in gold, back with dry embossed floral decorations
Collation	incorrect, first the text leaves followed by the maps in wrong order
Fly leaves	one contemporary, watermark cardinal's hat type 6

Frontispiece	title in black
Interleaves	all present, contemporary two, watermark cardinal's hat type 6 two, without watermark
Text	watermarks cardinal's hat, shearer scissors
Maps	world map and Europe 6 missing watermarks three mountains in a circle with a cross on top, P, cardinal's hat type 6, shearer scissors, crossbow in a circle
Backing	not applied
Register and colophon	not present
End leaves	one contemporary, without watermark
Illumination	on the page with the dedication to Federico, first capital, inhabited initial in gold, surrounded by a floral design, gold heightened at the bottom of the page in laurel wreath, coat of arms on a red field, unidentified gold decorations and a hexagon mountain in blue on a gold field, ribbons underneath laurel wreath
Colouring of maps	most maps uncoloured, when present, an aqueous green colour applied to the seas, most maps some ground bronze on mountains Asia 8, Asia 9, Asia 12 without ground bronze and without colour all modern maps and Europe 1, partially coloured, without ground bronze on mountains
Special observations	only a few images available contemporary binding? original fly leaf present one of four copies with watermark shearer scissors present in the paper used to print the gazetteer of Liber Secundus, this watermark is also found in the first printed maps, an indication the second half of the text pages of the <i>Geography</i> was printed following the first printing phase of maps only copy found with watermark cardinal's hat type 6 in interleaves only copy found with watermark cardinal's hat type 6 in maps maps from first and second printing phase, both present, in this copy map Europe 7, one of only two found in the first state maps Asia 8 and Asia 9 printed together, upturned, on one sheet of paper with unusual large dimensions, a partially identified ladder watermark, proof of engraving both maps on one copper plate edges of paper sieve visible on some maps blurred printing of many maps maps not backed, although some belong to the first, most to the second printing phase maps predominantly uncoloured stamp with Biblioteca Ferraioli
City	Rome
Library	Biblioteca Casanatense
Shelfmark	Vol.Inc.1110
Binding	later, parchment eighteenth century
Collation	incorrect, maps in between text leaves of Liber Tertius and Quartus, some maps in wrong order
Fly leaves	two later, watermark French lily in a double circle with a V on top, eighteenth century Italian paper
Frontispiece	title in red and black
Interleaves	four present, contemporary two, watermark cardinal's hat type 1

Text	two, without watermark some missing leaves watermarks cardinal's hat, ox
Maps	watermarks three mountains in a circle with a cross on top, P, cardinal's hat types 1 and 7
Backing	not applied
Register and colophon	not present, added in facsimile
End leaves	not present
Illumination	not applied
Colouring of maps	not applied
Special observations	frontispiece with wormholes possibly from another copy, text leaves and maps surely from different copies, amongst others based on paper size and watermarks map Asia 2 without watermark some maps printed on paper with chain lines running horizontally maps not backed and uncoloured register and colophon added in handwriting probably on fourth blank interleaf contemporary paper without watermark composite atlas, text leaves and maps present with different paper size copy added to first edition second printing phase, based on the watermarks found in the maps paper trimmed in the margin of some maps during rebinding
City	Florence
Library	Biblioteca Riccardiana
Shelfmark	SEDE.Ed.R.624
Binding	later, brown leather, sixteenth century
Collation	mostly correct
Fly leaves	two later, one modern, without watermark one parchment
Frontispiece	title in black
Interleaves	three present, contemporary two, watermark cardinal's hat type 1 one, without watermark one missing
Text	watermarks cardinal's hat, ox
Maps	watermarks three mountains in a circle with a cross on top, P
Backing	present on all maps, watermark cardinal's hat type 6
Register and colophon	not present
End leaves	two later, one parchment one without watermark
Illumination	not applied
Colouring of maps	all applied colours aqueous world map sea green regional maps, sea green mountains brown, ground bronze on mountains from the map <i>TABVLA DI LIBYA SECONDA</i> up to and including the map <i>TABVLA DVODECIMA D ASIA</i> the mountains were no longer coloured or provided with ground bronze
Special observations	a leaf of the gazetteer of Liber Quartus with the header Liber Sextus was found after the last leaf of the gazetteer of Liber Sextus; it was probably

wrongly reinserted during rebinding due to the presence of Sextus in the header

two variants of the watermark cardinal's hat type 6 found in the backing of the maps were exactly the same as present in several copies of the 1490 Rome *Cosmography* edition

City	Lucca
Library	Biblioteca Statale di Lucca
Shelfmark	Inc.214
Binding	later, parchment seventeenth or eighteenth century
Collation	correct
Fly leaves	three later, without watermark, same as end leaf
Frontispiece	missing
Interleaves	three present, contemporary two, watermark cardinal's hat type 1 one, without watermark one, missing
Text	first present text leaf restored watermarks cardinal's hat, ox
Maps	Asia 12 missing watermarks P, three mountains in a circle with a cross on top
Backing	present on all maps, watermarks, crossed keys in a circle with a cross on top, crossed keys in a circle, crescent
Register and colophon	not present
End leaves	one later, without watermark, same as fly leaves
Illumination	not applied
Colouring of maps	all applied colours aqueous world map, sea green, red sea pink red, lakes grey black, mountains yellow brown regional maps, sea green, red sea pink red Africa 3, Africa 4, Asia 6, lakes grey black Africa 4, margins with latitudes and longitudes yellow or purple ground bronze on all maps with exception of Africa 2, mostly on mountains, in some cases on trees or the margins with latitudes and longitudes inconsistent application of colouring, Africa 2 completely uncoloured, mountains sometimes not all, or not at all coloured, sometimes margins uncoloured paper trimmed during rebinding
Special observations	Ex libris Baroni
City	Venice
Library	Biblioteca Marciana
Shelfmark	Inc.0037
Binding	later, parchment, nineteenth century
Collation	correct
Fly leaves	two later, one nineteenth century one modern, wove paper without watermark
Frontispiece	title in black, only fragment with title pasted on 16th century sheet of paper
Interleaves	four present, contemporary one, watermark cardinal's hat type 1 one, watermark cardinal's hat type 2

Text	two, without watermark
Maps	watermarks cardinal's hat, ox watermarks three mountains in a circle with a cross on top, P, cardinal's hat type 7?
Backing	present on all maps, watermark cardinal's hat type unknown
Register and colophon	not present
End leaves	one modern, wove paper without watermark
Illumination	not applied
Colouring of maps	not applied
Special observations	a large bird watermark present in restored title page, same as in text pages of the Rome 1507/1508 Cosmography edition by Venetus de Vitalibus no text present recto sheet 27, usual text present verso sheet 27 only map found with corrosion present on both halves of the map Asia 7, printed by Tedescho during the second print run an additional contemporary leaf of paper added in front of the maps Asia 8 and 9 as in the most richly illuminated copies, both without watermark maps backed with sheet of paper with a cardinal's hat watermark mostly only partially visible therefore the type could not be determined
City	Venice
Library	Bibliotheca del Museo Correr
Shelfmark	Inc.D.013
Binding	later, parchment late eighteenth century
Collation	correct
Fly leaves	one present, late eighteenth century
Frontispiece	missing
Interleaves	one present, contemporary, without watermark three, missing
Text	first leaf missing watermarks cardinal's hat, shearer scissors
Maps	Asia 4 and Holy Land missing watermarks P, three mountains in a circle with a cross on top, cardinal's hat type 7?
Backing	present on all maps, watermarks, crescent, cardinal's hat type 6, ladder in a shield with a star on top
Register and colophon	not present
End leaves	not present
Illumination	not applied
Colouring of maps	not applied
Special observations	one of four copies with watermark shearer scissors present in the paper used to print the gazetteer of Liber Secundus, this watermark is also found in the first printed maps, an indication the second half of the text pages of the Geography was printed following the first printing phase of maps copy in a not so good condition with many restorations of the map first page of the gazetteer of Liber Quartus is a perfect example and proof of being printed twice by the colour difference of the ink and the difference in height of the text column on the left and right half of the page backing of the map Europe 10 with watermark ladder in a shield with a star on top probably concerns a later restoration or application with different paper

handwritten notes from the seventeenth century present on amongst others the maps Asia 7 and 11

City	Florence
Library	Biblioteca del Seminario arcivescovile maggiore
Shelfmark	D III 56
Binding	later, sixteenth century brown leather
Collation	correct
Fly leaves	three
	two later, same as end leaves
	one contemporary?
Frontispiece	title in black
Interleaves	three present, contemporary
	two, watermark cardinal's hat type 1
	one, without watermark
	one, missing
Text	watermark cardinal's hat
Maps	world map, Europe 1, Europe 2 modern, Europe 5, Europe 6, Europe 6 modern, Europe 8, Europe 9, Europe 10, Africa 1, Africa 2, Africa 4 and Asia 2, Asia 4, Asia 4 modern, Asia 5, Asia 6, Asia 7, Asia 8, Asia 9, Asia 10, Asia 11, and Asia 12 missing
	watermarks P, three mountains in a circle with a cross on top, crossbow in a circle
Backing	present on all maps, watermark tulip
Register and colophon	not present
End leaves	two later, same as fly leaves
Illumination	not applied
Colouring of maps	only on the map Europe 3 an aqueous green colour applied to the sea, only partially
Special observations	annotations in handwriting by the year 1621 on frontispiece
	handwritten notes in Greek and Latin on text pages
	many missing maps
	one map present with the very rarely found watermark crossbow in a circle
	only one map partially coloured
City	Vatican City
Library	Biblioteca Apostolica Vaticana
Shelfmark	Inc.S.120
Binding	later, eighteenth century plates, gold embossed frame, coat of arms of Pope Pius VI
Collation	mostly correct, one map misplaced
Fly leaves	one later, Italian Fabriano watermark, nineteenth century
Frontispiece	title in black
Interleaves	all present, contemporary
	four, without watermark
Text	watermarks cardinal's hat, shearer scissors, ox
Maps	watermarks three mountains in a circle with a cross on top, P, cardinal's hat
Backing	present on all maps, watermarks shearer scissors, cardinal's hat type 1, crowned eagle
Register and colophon	not present, leaf from another copy added, based on the deviating paper size, without watermark

End leaves	?
Illumination	on the page with the dedication to Federico, first capital, inhabited initial in gold, surrounded by a floral design, gold heightened at the bottom of the page, in laurel wreath, coat of arms of the family Rucellai, lion in black on a red field, golden decoration on a blue field, ribbons underneath laurel wreath
Colouring of maps	all applied colours aqueous seas green, mountains light brown to yellow brown, red sea Asia 4, Asia 6 red ground bronze on mountains on all maps the borders of the maps coloured
Special observations	copy of the Rucellai family only a few images available one of four copies with watermark shearer scissors present in the paper used to print the gazetteer of Liber Secundus, this watermark is also found in the first printed maps, an indication the second half of the text pages of the <i>Geography</i> was printed following the first printing phase of maps one of two copies found with the imprint of a cleaning cloth on the map Asia 7 belonging to the second printing phase, based on the presence of the watermark p in the paper of the map the map Asia 7 is composed of two halves of different origins based on the pattern of the glue, the difference in colour and the way the bronze was applied on both halves of the map bonding of the maps heavily discoloured, therefore watermarks hardly detectable leaf with the register and colophon added from another copy, based on different paper size restored copy, compiled with maps from different copies based on the watermarks, the different size of the maps, page numbering in same handwriting on some maps with a certain size and missing on others with another paper size a difficult copy to describe, almost no watermarks detectable, in combination with the fact the copy is a composite first edition, based on the watermarks and the backings second printing phase, predominantly based on the state of the maps and the type of colouring paper trimmed during rebinding former owner Alessandro Gegorio Capponi, October 1735 on the binding, the coat of arms of Pope Pius VI inside, coat of arms De Rossi-Borbone
City	London
Library	British Library
Shelfmark	C.1.d.1
Binding	later, red leather, royal coat of arms in gold, nineteenth century
Collation	mostly correct, one modern map misplaced
Fly leaves	two later, wove paper
Frontispiece	title in black, heavily restored
Interleaves	all missing
Text	one missing leaf watermark cardinal's hat

Maps	watermarks shearer scissors, cardinal's hat type 1, P, three mountains in a circle with a cross on top, cardinal's hat 7, anchor in a circle with a star on top type 3, crossed arrows with a star on top, ladder in a circle with a star on top
Backing	not applied or present
Register and colophon	not present
End leaves	two later, wove paper
Illumination	not applied
Colouring of maps	Africa 2, Africa 3, Africa 4 and Asia 7 only sea coloured green Asia 9 only mountains coloured brown, ground bronze applied on mountains
Special observations	handwriting on text pages from sixteenth or seventeenth century some maps printed on paper with horizontally running chain lines handwriting on the added map Asia 12, late sixteenth century maps not backed and mostly uncoloured maps restored backed and bound in twentieth century some second edition maps added, Europe 6 modern, Europe 7, Asia 4 modern, Asia 12, based on the watermarks paper trimmed in the margin of some maps during rebinding bought from private person in 1795 in Arezzo, by Luigi de Chigli? stamp British Library November 6, 1867
City	Milan
Library	Biblioteca Nazionale Braidense Milano
Shelfmark	AK.XVI.13
Binding	later, half parchment and marble paper, nineteenth century
Collation	incomplete
Fly leaves	later
Frontispiece	missing
Interleaves	all missing
Text	completely missing
Maps	world map, Africa 1, Asia 1, Asia 10, Asia 11 and Asia 12 missing watermarks cardinal's hat?, P, three mountains in a circle with a cross on top
Backing	present on all maps, watermarks, shearer scissors, cardinal's hat type 9, ladder, crowned eagle
Register and colophon	not present
End leaves	missing
Illumination	missing
Colouring of maps	all applied colours aqueous regional maps, margins with latitudes and longitudes yellow or purple, sea green, red sea purple Africa 4, Asia 6, lakes and forests yellow green Europe 3 modern, mountains yellow brown not all margins and mountains coloured and inconsistently coloured on some maps ground bronze present on mountains
Special observations	only maps present and incomplete watermarks in maps belonging to second printing phase watermark shearer scissors, present in the backing of the maps belonging to this copy, also found in the paper of the maps belonging to the first printing phase paper trimmed in the margin of some maps during rebinding

City	Chicago
Library	Newberry Library
Shelfmark	Ayer 6.P9 B5 1480a
Binding	later
Collation	no information available
Fly leaves	no information available
Frontispiece	title in black
Interleaves	no information available
Text	watermark cardinal's hat, no information available about possible presence of other watermarks
Maps	watermark P (cardinal's hat not detected by curator)
Backing	later, maps backed with textile
Register and colophon	no information available
End leaves	no information available
Illumination	no information available
Colouring of maps	two images available, some mountains coloured yellow brown, aqueous colour, traces of ground bronze present on mountains
Special observations	a few images available in combination with information by e-mail received from Dr. Suzanne Karr Schmidt, Curator of Rare Books and Manuscripts, Newberry Library paper trimmed during rebinding
City	Chicago
Library	Newberry Library
Shelfmark	Ayer 6.P9 B5 1480b
Binding	later
Collation	no information available
Fly leaves	no information available
Frontispiece	title in black and red, probably added later
Interleaves	no information available
Text	watermark cardinal's hat, no information available about possible presence of other watermarks
Maps	watermark P (cardinal's hat not detected by curator), no information available about possible presence of other watermarks
Backing	maps backed with additional sheet of paper, possibly with watermark crossed arrows with a star below, different from all watermarks found in the copies studied, possibly the backing is applied later
Register and colophon	no information available
End leaves	no information available
Illumination	present, including devices or coat of arms of owner ⁷⁰
Colouring of maps	one image available, sea coloured blue some mountains yellow brown, both aqueous colours, traces of ground bronze present on mountains
Special observations	a few images available in combination with information by e-mail received from Dr. Suzanne Karr Schmidt, Curator of Rare Books and Manuscripts, Newberry Library title in red and black probably later added, based on the conflicting presence of illumination, the present devices or coat of arms of its owner and the watermark P found in the maps image received of watermark crossed arrows with a star below in a backing, the watermark is different from all watermarks found in the copies studied, possibly later applied

⁷⁰ Roberts, op. cit. (n. 28), *Cartography between cultures: Francesco Berlinghieri's Geographia of 1482*, p. 133.

paper trimmed during rebinding

Second Edition

City	Milan
Library	Biblioteca Nazionale Braidense Milano
Shelfmark	AK.XVI.12
Binding	modern, half leather wooden boards
Collation	incorrect, first the text leaves, followed by the maps, both in wrong order
Fly leaves	not present
Frontispiece	title in red and black
Interleaves	one present, contemporary one, without watermark three, missing
Text	watermark cardinal's hat
Maps	watermarks hand with a star on top, two variants of an anchor in a circle with a star on top type 2
Backing	not applied
Register and colophon	present, watermark cardinal's hat type 4
End leaves	two later, watermark Fabriano 1960
Illumination	not applied
Colouring of maps	not applied
Special observations	the only copy found with some text printed in red on a regular text page, in the heading at the beginning of Liber Quartus the map Asia 12 was cut at the left side, next to the printed image, therefore the watermark was missing paper trimmed in the margin of some maps during rebinding
City	Rome
Library	Biblioteca Nazionale Centrale di Roma
Shelfmark	70.1.G.7
Binding	later, eighteenth century, half parchment, decorated paper boards
Collation	mostly correct
Fly leaves	later, lily in a circle with monogram Italian watermark, early nineteenth century, as end leaf
Frontispiece	title in red and black
Interleaves	all missing
Text	two missing leaves watermark cardinal's hat
Maps	Europe 2 and Europe 2 modern missing watermarks hand with a star on top, two variants of an anchor in a circle with a star on top type 2, crescent in a circle with a cross on top
Backing	not applied
Register and colophon	present, watermark cardinal's hat type 4
End leaves	lily in a circle with monogram Italian watermark, early nineteenth century, as fly leaf
Illumination	not applied
Colouring of maps	not applied
Special observations	binding strip with handwritten text from the fifteenth century used for some maps, probably applied in the seventeenth or eighteenth century during rebinding

the map Europe 6 may be a later addition based on the watermark, a less dark impression and the missing page number on the map, in contrast with the other maps

City	Rome
Library	Biblioteca Nazionale Centrale di Roma
Shelfmark	70.1.G.10
Binding	later, brown leather, early eighteenth century
Collation	mostly correct
Fly leaves	later, watermark lily in a circle with monogram on top and the F from Fabriano below, eighteenth century, Italian paper
Frontispiece	title in red and black
Interleaves	three present, contemporary two, watermark cardinal's hat type 1 one, without watermark one, missing
Text	watermark cardinal's hat
Maps	watermarks hand with a star on top, two variants of an anchor in a circle with a star on top type 2
Backing	not applied
Register and colophon	present, without watermark
End leaves	not present
Illumination	not applied
Colouring of maps	not applied
Special observations	paper trimmed in the margin of some maps during rebinding
City	Vatican City
Library	Biblioteca Apostolica Vaticana
Shelfmark	Stamp.Ross.301
Binding	?
Collation	incorrect, first text up to Liber Tertius followed by the maps and the rest of the text
Fly leaves	three later
Frontispiece	title in red and black
Interleaves	two present, contemporary one, watermark cardinal's hat type 1 one, without watermark two, missing
Text	watermark cardinal's hat
Maps	world map missing watermarks crescent in a circle with a cross on top, anchor in a circle with a star on top type 3
Backing	not applied
Register and colophon	present, restored, without watermark
End leaves	?
Illumination	not applied
Colouring of maps	not applied
Special observations	only a few images available maps Asia 8 and Asia 9 printed together on one sheet, upturned, proof of engraving of both maps on one copper plate edges of paper sieve visible on some maps

City	London
Library	Royal Geographical Society
Shelfmark	CA15F-002
Binding	later
Collation	incomplete
Fly leaves	missing
Frontispiece	missing
Interleaves	all missing
Text	completely missing
Maps	world map, Europe 2 modern, Europe 3 modern, Europe 5, Asia 4 modern, Asia 10, Asia 11 and Asia 12 missing watermarks crescent with a cross on top, crescent in a circle with a cross on top
Backing	not applied
Register and colophon	missing
End leaves	missing
Illumination	missing
Colouring of maps	not applied
Special observations	no images available only maps present and incomplete only one half of the maps Europe 6 and Europe 7 present some kind of later applied backing to maps as reinforcement donated to the RGS by Henry Yates Thompson
City	Rome
Library	Biblioteca dell'Accademia Nazionale dei Lincei e Corsiniana
Shelfmark	51.G.1
Binding	later, nineteenth century, brown leather
Collation	correct?
Fly leaves	two later, monogram watermark, nineteenth century
Frontispiece	title in red and black
Interleaves	three present, contemporary two, watermark cardinal's hat one, without watermark one, missing
Text	watermarks cardinal's hat, shearer scissors
Maps	watermarks crescent in a circle with a cross on top, crescent with a cross on top
Backing	"present" maps bonded together, in some cases a real backing, watermark ladder in a circle with a star on top
Register and colophon	present, watermark cardinal's hat type 4
End leaves	two later, monogram watermark, nineteenth century
Illumination	not applied
Colouring of maps	not applied
Special observations	no images available one of four copies with watermark shearer scissors present in the paper used to print the gazetteer of Liber Secundus, this watermark is also found in the first printed maps, an indication the second half of the text pages of the <i>Geography</i> was printed following the first printing phase of maps strange way of backing the maps by gluing them together or with a preceding text leaf or interleaf

only second edition copy found with contemporary paper used to back the maps, in case an additional leaf of paper was applied
paper trimmed during rebinding?

City	London
Library	British Library
Shelfmark	C.3.d.10
Binding	later, eighteenth century, red leather, coat of arms of king George III in gold
Collation	correct, one modern map misplaced
Fly leaves	three later, two watermark lily in a shield above initials G R from George Rex countermark Portal, eighteenth century
Frontispiece	title in red and black, heavily restored
Interleaves	all missing
Text	one missing leaf watermark cardinal's hat
Maps	Asia 12 missing world map reinforced or backed with linen watermark crescent in a circle with a cross on top
Backing	not applied
Register and colophon	present, without watermark
End leaves	three later, one without watermark, two watermark arms of Strasbourg with countermark J Whatman, eighteenth century
Illumination	not applied
Colouring of maps	not applied
Special observations	several maps bound, rotated 90 degrees and folded paper trimmed in the margin of some maps during rebinding collection King George III
City	Milan
Library	Biblioteca Ambrosiana
Shelfmark	Inc.422bis
Binding	later
Collation	correct?
Fly leaves	one later, watermark French lily in a shield late eighteenth century, same as end leaf
Frontispiece	undeterminable, backed with a leaf of paper with a watermark from the eighteenth century with the coat of arms of Strasbourg, title in black visible, title in red invisible possibly caused by restoration and backing
Interleaves	all missing
Text	watermarks cardinal's hat, crowned eagle, ox
Maps	watermarks crescent with a cross on top, crescent in a circle with a cross on top, anchor in a circle with a star on top type 2
Backing	not applied
Register and colophon	not present or missing, added in facsimile on twentieth century paper
End leaves	one later, watermark French lily in a shield, late eighteenth century, same as fly leaf
Illumination	not applied
Colouring of maps	not applied
Special observations	no images available one of two copies found with the watermark crowned eagle present in the paper used to print the gazetteer of Liber Secundus a composite

	atlas, leaf with the register and colophon in facsimile, maps clearly second edition paper trimmed during rebinding
City	London
Library	The British Museum
Shelfmark	163.b.1
Binding	modern, half leather
Collation	incorrect, first the text leaves followed by the maps
Fly leaves	four three wove paper modern leaves one sixteenth century Italian watermark crossed arrows with a star on top
Frontispiece	title in red and black, heavily restored
Interleaves	three present, contemporary one, watermark cardinal's hat type 1 two, without watermark one, missing
Text	watermark cardinal's hat
Maps	watermarks crescent with a cross on top, crescent in a circle with a cross on top, anchor in a circle with a star on top type 3
Backing	not applied
Register and colophon	present, without watermark
End leaves	not present
Illumination	not applied
Colouring of maps	not applied
Special observations	restored copy served as example for the facsimile atlas with the foreword by Skelton
City	Paris
Library	Bibliothèque nationale de France
Shelfmark	C 2035 9
Binding	later, leather binding gold stamp nineteenth century
Collation	mostly correct, one modern map and leaf with the register and colophon misplaced
Fly leaves	two later, no information about watermarks
Frontispiece	title in red and black
Interleaves	three present, one missing, no information about watermarks
Text	watermark cardinal's hat, found in some text leaves no information available about possible presence of other watermarks
Maps	crescent in a circle with a cross on top, found in some maps, no information available about possible presence of other watermarks
Backing	not applied
Register and colophon	present, no information about watermark
End leaves	two later no information about watermarks
Illumination	not applied
Colouring of maps	later, nineteenth century applied colouring all applied colours aqueous world map, margins with longitudes and the names of the wind directions yellow, hair of wind-faces yellow brown, sea blue, mountains yellow brown regional maps, margin with latitudes and longitudes yellow, sea blue, forests green, mountains yellow brown, circles representing places red

Special observations	<p>letters in title, islands and names of larger regions, only on Europe 1, red mountains uncoloured, only on Europe 2 modern atlas found on the internet, not personally studied Ex libris Comes Demetrius Boutourlin edges of paper sieve visible on several maps</p>
Internet	Historic Map Works
Item number	OL5386
Binding	contemporary, half leather wooden boards
Collation	probably correct
Fly leaves	one present, contemporary? no information about watermark
Frontispiece	title in red and black
Interleaves	one present, contemporary? one, no information about watermark three missing
Text	watermark cardinal's hat, found in some text leaves, no information available about possible presence of other watermarks
Maps	crescent in a circle with a cross on top, found in some maps, no information available about possible presence of other watermarks
Backing	not applied
Register and colophon	present, no information about watermark
End leaves	one present contemporary?, no information about watermark
Illumination	not applied
Colouring of maps	not applied
Special observations	atlas found on the internet, not personally studied Ex libris George Tollet Esquire
City	Brussels
Library	De Koninklijke Bibliotheek van België
Shelfmark	Inc C 208
Binding	later, leather binding gold stamp nineteenth century
Collation	incorrect, maps misplaced and in incorrect order
Fly leaves	two later
Frontispiece	title in red and black
Interleaves	one, contemporary without watermark one, watermark cardinal's hat 1 one, watermark crowned eagle one, missing
Text	watermark cardinal's hat, ox
Maps	watermarks anvil with a hammer in a circle, boat, crescent with a cross on top, crossed arrows with a star on top, crescent in a circle with a cross on top, ladder in a shield with a star on top, anchor in a circle with a star on top type 2 and 3, crossbow in a circle with a lily on top, P
Backing	not applied
Register and colophon	present, watermark cardinal's hat type 4
End leaves	two later
Illumination	not applied
Colouring of maps	not applied
Special observations	fine copy in very good condition but re-bound

only copy found with the correctly applied page numbers .aa iiii. and .aa iiii.

only interleaf found with the watermark crowned eagle

a few maps contain the watermark P belonging to the first edition second printing phase printed by Tedescho

only copy found with watermarks characteristic of each of the three print runs by Giunti in the paper of the maps

only copy found with the erroneously applied Tertius in the header of the gazetteer of Liber Septimus maps Asia 8 and Asia 9 printed together on one sheet, upturned, proof of engraving of both maps on one copper plate

City	London
Library	British Library
Shelfmark	G.8173
Binding	later, early nineteenth century, brown leather
Collation	correct, one modern map misplaced
Fly leaves	two later, wove paper
Frontispiece	title in red and black
Interleaves	all missing
Text	watermark cardinal's hat
Maps	watermarks crescent with a cross on top, crossed arrows with a star on top, crescent in a circle with a cross on top, ladder in a shield with a star on top, anchor in a circle with a star on top type 3, crossbow in a circle with a lily on top, cardinal's hat types 1 and 7
Backing	not applied
Register and colophon	present, without watermark
End leaves	two later, one watermark J Budgen, 1806, one without watermark
Illumination	not applied
Colouring of maps	not applied
Special observations	Asia 6, Asia 11, Asia 12 added by Giunti or later, based on presence of first edition watermarks later applied backing present on Asia 11 paper trimmed in the margin of some maps during rebinding Earl Spencers copy, bought from the library of Salicette, physician of Pope Pius according to a handwritten note later collection Grenville
City	London
Specialist Dealer	Daniel Crouch Rare Books and Maps
Stock number	Reference 12890
Binding	later, parchment eighteenth century
Collation	mostly correct, some maps misplaced
Fly leaves	three later, watermark lily in a double circle, second half seventeenth or eighteenth century, same as end leaves
Frontispiece	title in red and black
Interleaves	all missing
Text	watermark cardinal's hat
Maps	watermarks boat, crossed arrows with a star on top, anchor in a circle with a star on top type 3, anvil with a hammer in a circle, crossed arrows in a circle with a star on top, crossbow in a circle with a lily on top
Backing	not applied
Register and colophon	present, watermark cardinal's hat type 4

End leaves	three later, watermark lily in a double circle, second half seventeenth or eighteenth century, same as fly leaves
Illumination	not applied
Colouring of maps	not applied
Special observations	fine copy paper trimmed during rebinding former owners Francisci Amadi, his sixteenth-century signature on titlepage and on page with the register and colophon Marquess of Bute, his sale, Sotheby's London, October 16, 1961, lot 661 Otto Schäfer, his monogram on the rear paste-down, his sale, Sotheby's New York, December 8, 1994, lot 25
City	Turin
Library	Biblioteca Nazionale Universitaria di Torino
Shelfmark	XV.I.41
Binding	later, parchment eighteenth century
Collation	incorrect, some maps misplaced
Fly leaves	one later, watermark sun with countermark, eighteenth century, same as end leaf
Frontispiece	title in red and black, restored and backed
Interleaves	one present one, watermark cardinal's hat type 1 three, missing
Text	first leaves with mould and restorations watermarks cardinal's hat, ox
Maps	watermarks anvil with a hammer in a circle, crossed arrows in a circle with a star on top, crescent in a circle with a cross on top, anchor in a circle with a star on top type 2
Backing	not applied, three exceptions Europe 1, 6, 6 modern watermark sun with countermark, same as fly and end leaf
Register and colophon	present, watermark cardinal's hat type 3
End leaves	one later, watermark sun with countermark, eighteenth century, same as fly leaf
Illumination	not applied
Colouring of maps	not applied
Special observations	Europe 1, Europe 6, Europe 6 modern probably backed during rebinding, the same watermark is present in the backing as in the fly and end leaf some maps restored paper trimmed in the margin of some maps during rebinding
City	Milan
Library	Biblioteca Nazionale Braidense Milano
Shelfmark	AM.XV.36
Binding	later, nineteenth century, brown leather gold stamp
Collation	incorrect, text leaves and maps both in wrong order
Fly leaves	two later, early nineteenth century one watermark Venetian lion one watermark lily with monogram, same as end leaves
Frontispiece	title in red and black
Interleaves	three present, contemporary two, watermark cardinal's hat type 1 one, without watermark

Text	one, missing
Maps	watermarks cardinal's hat, ox with a star on top type 3, ladder in a shield with a star on top
Backing	not applied
Register and colophon	present, without watermark
End leaves	two later, early nineteenth century one watermark Venetian lion one watermark lily with monogram, same as fly leaves
Illumination	not applied
Colouring of maps	not applied
Special observations	only copy with watermark ox found twice in text leaves left side of Europe 6 restored, backed with later leaf of paper, without watermark paper trimmed in the margin of some maps during rebinding
City	London
Library	Royal Geographical Society
Shelfmark	CA15F-001
Binding	later
Collation	correct?
Fly leaves	?
Frontispiece	title in red and black
Interleaves	all missing
Text	watermarks cardinal's hat, ox
Maps	watermarks cardinal's hat, anvil with a hammer in a circle, ladder in a shield with a star on top, crescent in a circle with a cross on top, crossed arrows in a circle with a star on top, eagle in a circle, boat
Backing	present, on two maps, watermark cardinal's hat type 1
Register and colophon	present, heavily restored, backed with new paper, no watermark detectable in original paper
End leaves	?
Illumination	not applied
Colouring of maps	not applied
Special observations	only a few images available world map as well as Europe 6, present in this copy, first edition first state maps, both with original backing, uncoloured, probably remaining personal stock of Berlinghieri, comparable with the maps used for the Alessandrina copy, although these two maps were bound in a second edition copy by Giunti, in possession of copper plates and old stock Asia 10, Asia 11, Asia 12 restored, backed with later paper paper trimmed in the margin of some maps during rebinding donated to the RGS by Alexander Peckover
City	Milan
Library	Biblioteca Ambrosiana
Shelfmark	Inc.422
Binding	later, early nineteenth century
Collation	incorrect
Fly leaves	two later watermark monogram, nineteenth century, as end leaf watermark winged angel with star on top, seventeenth century
Frontispiece	title in red and black

Interleaves	all missing
Text	watermarks cardinal's hat, ox
Maps	watermarks crossed arrows with a star on top, anvil with a hammer in a circle, ladder in a circle with a star on top, crescent in a circle with a cross on top, ladder in a shield with a star on top, boat, anchor in a circle with a star on top type 3
Backing	not applied
Register and colophon	present, without watermark
End leaves	one later, watermark monogram, nineteenth century, as fly leaf
Illumination	not applied
Colouring of maps	not applied
Special observations	no images available composite atlas?, maps Europe 5, Asia 12 with mould, possibly added from another copy in the seventeenth century? all maps numbered in seventeenth century handwriting, probably applied during rebinding paper trimmed in the margin? of some maps during rebinding
City	Florence
Library	Biblioteca Nazionale Centrale di Firenze
Shelfmark	Palat D.7.1.5
Binding	later, cream yellow leather nineteenth century
Collation	mostly correct
Fly leaves	one later, watermark unidentified
Frontispiece	title in red and black
Interleaves	one present, contemporary one, without watermark three, missing
Text	watermarks cardinal's hat, crowned eagle
Maps	watermarks crescent in a circle with a cross on top, crossed arrows with a star on top, crossed arrows in a circle with a star on top, eagle in a circle, boat, anvil with a hammer in a circle, ladder in a circle with a star on top, ladder in a shield with a star on top, anchor in a circle with a star on top type 2b, crossbow in a circle
Backing	not applied
Register and colophon	present, restored and backed, watermark not visible in leaf with register and colophon, in leaf of the backing unidentified watermark with counter mark
End leaves	one later, without watermark
Illumination	not applied
Colouring of maps	not applied
Special observations	one of two copies found with the watermark crowned eagle present in the paper used to print the gazetteer of Liber Secundus
City	Vatican City
Library	Biblioteca Apostolica Vaticana
Shelfmark	Stamp.Barb.AAA.IV.15
Binding	later, with characteristics of the Barberini family, printed in gold
Collation	correct?
Fly leaves	one later, without watermark
Frontispiece	title in red and black
Interleaves	three present, contemporary two, watermark cardinal's hat type 1

	one, without watermark
	one, missing
Text	watermark cardinal's hat
Maps	world map and Asia 4 modern missing
	watermarks boat, ladder in a shield with a star on top, ladder in a circle with a star on top, crossed arrows with a star on top
Backing	not applied, possibly with exception of Africa 3
	watermarks unidentifiable
Register and colophon	present, watermark cardinal's hat type 4
End leaves	one later, nineteenth century watermark lily
Illumination	not applied
Colouring of maps	not applied
Special observations	no images available
	donated by Vincenzo Noghera to cardinal Francesco Barberini, nephew of Pope Urban VIII, founder of the Barberini Library in 1639, stamp present, Bibliot. Barberina 1837

Atlas without maps

City	Siena
Library	Biblioteca Comunale degli Intronati
Shelfmark	O.II.35
Binding	later, parchment eighteenth century
Collation	correct, incomplete
Fly leaves	one later, watermark sun with the letter G underneath the sun, Italian eighteenth century same as end leaf
Frontispiece	only a fragment with title in black, on leaf of paper with watermark sun with letter G underneath the sun, same as fly and end leaf
Interleaves	one present, contemporary
	one, without watermark
	three, missing
Text	two missing leaves
	watermark cardinal's hat
Maps	completely missing
Backing	missing?
Register and colophon	not present
End leaves	one later, watermark sun with the letter G underneath the sun, Italian eighteenth century same as fly leaf and frontispiece
Illumination	not applied
Colouring of maps	missing
Special observations	only text leaves present, two leaves missing

CHAPTER 8

Berlinghieri's Geographia and Geography

Introduction

Berlinghieri's *Geography* was created in the transition period from manuscripts to printed books. By the time the first printers became active in Florence and indeed in Europe, they had to compete with a blooming production of manuscripts. This industry had evolved from the small studios in monasteries into a fully developed and complex system over a period of four hundred years. It also engaged in the permanent search for older lost manuscripts scattered over Europe and the Middle East. Much of the Classical legacy was only known in fragmentary state and every addition was welcomed. An ever-growing demand for more copies and more sumptuous designs and bindings, resulted in a highly specialised group of parchment workers, text copyists, miniaturists, illuminators, colourists, goldsmiths, binders, and inevitably specialised dealers in manuscripts, like Vespasiano da Bisticci.¹ Being at the centre of the Renaissance movement Florence provided the perfect setting. The intricate system was further endorsed by the grace of influential, wealthy, and intellectual clients like the Medici, Pazzi, Rucellai, Strozzi, Berlinghieri, and many others. The copying of a manuscript was a laborious and time-consuming task. When Berlinghieri wrote his *Geographia* it already was a well-structured process. In this environment the new phenomenon of book printing tried to find its place. Invented around 1453 by the German Gutenberg, it found its way to Italy around 1460. Because of the rudimentary quality in its early stages, printed books were considered to be inferior to manuscripts.² The early printed products in Florence show many shortcomings. One could argue that the wealthy collectors were right. However, with increasing experience and professionalism, the quality of book printing developed remarkably and in a short time. Nevertheless, Vespasiano da Bisticci refused to trade in printed books even though Florentine librarians now offered them in greater numbers than manuscripts and at a lower price. He no doubt financed his luxury manuscripts, the illuminated codices which he sold for 50 florins, with the sale of cheaper works and of second-hand books such as handwritten grammars and psalm books. The market for such goods collapsed with the rise of the printed book. Vespasiano continued to regard the manuscripts as superior and to disapprove of the printed book and its less sophisticated and erudite readership. When he retired from active bookselling at the end of 1480, at the age of 58, his successor Andrea di Lorenzo who called himself Andrea di Vespasiano would not have the reservations of his predecessor.³ In addition to Tedescho's printing office and the one of the Ripoli convent, Antonio di Miscomini arrived in Florence at the end of 1480. He had opened a business in Venice in 1476 but it seemed wise to him to move his enterprise to Florence given the overcrowded book market in Venice. This resulted in both printers and *cartolaios* being stuck with large stocks of unsold books.⁴ Besides books, a market for engraved images printed on paper emerged as well.⁵

Berlinghieri's manuscripts: the *Geographia*

In addition to the printed edition of the *Geography*, two manuscripts of Berlinghieri's *Geographia* have been preserved. The manuscript kept in the Vatican City originally comes from the Urbinate library of Federico da Montefeltro. It can be consulted on the internet and has been described

¹ Ross King, *The bookseller of Florence* (Amsterdam 2021), pp. 124-53. In this book, King describes in detail all aspects of the manufacture, illumination, and colouring of manuscripts from raw material to finished product.

² King, op. cit. (n. 1), p. 326. Federico d'Urbino shared Vespasiano da Bisticci's low opinion of printed books. They were given no place among his manuscripts but kept in a separate room with codices that still had to be bound and incomplete manuscripts.

³ Ibid, pp. 395-96.

⁴ Ibid, p. 397.

⁵ Arthur M. Hind, *A history of engraving and etching* (New York, 1963), pp. 36-7.

TABVLA DECIMA DE ASIA					
A bur	120	16	B arbaria	113	
A cur	124 $\frac{3}{4}$	15 $\frac{1}{3}$	B arborana	120 $\frac{1}{4}$	24 $\frac{1}{2}$
A damante infoce	142 $\frac{2}{3}$	18	B ardaoti	132 $\frac{1}{2}$	31 $\frac{1}{3}$
F onte	142	24	B ardamana	136 $\frac{1}{4}$	28 $\frac{1}{2}$
A darima	110 $\frac{1}{2}$	15 $\frac{1}{3}$	B ardarima	113 $\frac{2}{3}$	15 $\frac{1}{2}$
A disatbra	125 $\frac{1}{2}$	24 $\frac{1}{2}$	B arigaza epo	113 $\frac{1}{4}$	20 $\frac{1}{3}$
A disatbro	132	23	B aris infoce	110	17 $\frac{1}{3}$
A disatbro monte	132	23	F onte	125 $\frac{1}{2}$	14 $\frac{1}{3}$
A disdara	136	31 $\frac{1}{2}$	B ata	126 $\frac{1}{2}$	21
A gara	129 $\frac{1}{3}$	25	B atanagra	130	17
A grinagara	118 $\frac{1}{4}$	22 $\frac{1}{2}$	B atacefarea	132 $\frac{2}{3}$	33 $\frac{1}{3}$
A loa	120 $\frac{2}{3}$	17	B enacoro	140	33 $\frac{1}{3}$
A loigna	135 $\frac{2}{3}$	11 $\frac{1}{2}$	B endia infoce	111 $\frac{1}{2}$	20 $\frac{1}{4}$
A macate	128 $\frac{1}{4}$	32 $\frac{1}{3}$	B era	130 $\frac{1}{3}$	15
A nara	122 $\frac{1}{2}$	22 $\frac{1}{2}$	B erderi	119	16 $\frac{1}{2}$
A ndrapana	124 $\frac{1}{4}$	30 $\frac{1}{3}$	B etana regia	117	18 $\frac{1}{2}$
A minacha	132 $\frac{1}{3}$	31 $\frac{1}{2}$	B etico monte	123 21	130 20
			B ibali in zaradro	130	34
			F onte	131	35

Fig. 723

in detail by Fischer (see attachment six).⁶ It is 46 cm high and 32 cm wide. The second manuscript is present in the Braidense Library in Milan. It appears to have been made for Lorenzo de Medici.⁷ It is slightly smaller, 43.5 cm high and 30.9 cm wide. According to Carta, they were written by the same copyist. He attributes the illuminations of both manuscripts to Attavante.⁸ Veneziani ascribes both to one artist but a different one, possibly Bartolomeo di Paolo.⁹ It is certain that he was the illuminator of the atlas in the Biblioteca Alessandrina.¹⁰ Veneziani also believes that both manuscripts were written by the same unidentified copyist.¹¹ In our opinion, both manuscripts were unmistakably written by different copyists. This is most obvious in the gazetteers, where the spelling of numbers and fractions can be compared in addition to the capitals and lowercase letters. In the Vatican manuscript, there are clear differences between the handwriting used for e.g., the gazetteer of *TABVLA PRIMA D EVROPA* and that used for *TABVLA DECIMA D ASIA*.¹² The handwriting applied in the gazetteer of the Braidense manuscript for *TABVLA DECIMA D ASIA* is shown in figure 723. Garzelli attributes the illuminations to two different artists: the codex for Lorenzo de Medici to Attavante, and the one for Federico da Montefeltro to the so-called Master of the Hamilton Xenophon. Both illuminators were students of Francesco d'Antonio del Chierico and worked in his studio.¹³ All three of them seem to have worked on the illumination of Urbino's Bible. We have not found any indications to be conclusive in who the copyists and illuminators may have been. The style and quality of the miniatures and illuminations in both

⁶ Joseph S.J. Fischer, *Claudii Ptolemaei Geographicae Codex Urbinas Graecus 82* (Leiden 1932), pp. 375-98; Biblioteca Apostolica Vaticana, shelfmark Urb.lat.273: https://digi.vatlib.it/view/MSS_Urb.lat.273

⁷ Claudius Ptolemaeus, *Francesco Berlinghieri Geographia Florence 1482*, with an introduction by Raleigh A. Skelton (Amsterdam 1966), p. VI; Biblioteca Nazionale Braidense Milano, shelfmark AC.XIV.44.

⁸ Francesco Carta, *Codici corali e libri a stampa miniati Della Biblioteca Nazionale di Milano*, (Roma 1891), pp. 95-8.

⁹ Paolo Veneziani, 'Vicende tipografiche della *Geografia* di Francesco Berlinghieri', *La Bibliofilia*, 84, (1982), p. 197.

¹⁰ Raphaele Tauci, 'La geografia del Berlinghieri della Biblioteca Alessandrina di Roma', *La Bibliofilia*, 69, (1967), pp. 71-2.

¹¹ Veneziani, op. cit. (n. 9), pp. 197-99, 202.

¹² It can be compared on the following website where the Vatican manuscript is displayed in full:

https://digi.vatlib.it/view/MSS_Urb.lat.273

¹³ Philine Helas, 'Der fliegende Kartograph', *Mitteilungen des Kunsthistorischen Institutes in Florenz*, 46 (2002), pp. 274, 299.



Fig. 724

manuscripts appears very diverse (Fig. 724).¹⁴ This is an indication that several hands have worked on them, apprentices as well as masters, which was customary at the time as described by King in his book about Vespasiano da Bisticci.¹⁵

In the Vatican manuscript on the recto side of the first sheet, the title, and the introductory letter in verses from Berlinghieri to Federico are present. This is followed by Ficino's *apologus* on the verso which was probably written between April 17 and May 9, 1482.¹⁶ On the recto side of the second sheet we find an *apologia* for the death of Federico by Berlinghieri addressed to his son and successor Guido after his father's death on September 10, 1482. According to us it is written in a different handwriting and with much more use of accents above the letters. The colour of the ink differs from that on the preceding and following sheets.¹⁷ Almagià described that this sheet of parchment has a different color and size than the other ones and that it was inserted into the existing binding.¹⁸ He deduced that the manuscript was completed before the death of Federico. On the verso side of this second sheet the index of regions and large islands is written in the same handwriting as on the first text pages of the manuscript. We believe that the index of regions and large islands was originally on the recto side and that the verso was blank. It is not logical that this index was written on a sheet that was added afterwards, as it is part of Berlinghieri's manuscript. Therefore, after Federico's death, this sheet of parchment must have been removed and turned over. On the originally blank verso, the *apologia* to Urbino's son Guido must have been added. By turning the sheet over, it became the recto. This way the text was in line with the dedication to Federico and Ficino's *apologus* on the preceding pages. The recto of the third sheet is empty. The verso contains a richly decorated cartouche. In the middle of the page a gold medallion with the title, surrounded by four *insignias*, is placed between two columns with Corinthian capitals. In the lower border, the coat of arms of the Montefeltro family is present. On the front of the fourth sheet a second frontispiece in a richly gilded frame on a blue background with tendrils, cherubs, pearls, small miniatures, and a profile view of Federico in the middle of the capital G is present.¹⁹ Here, he looks to the right and is intentionally depicted as such because he misses his left eye. Helas described this frontispiece in detail.²⁰ On all sides in smaller *tondi* various of Federico's imprints are present: the emblem of the Order of the Garter, flames with the letters FE.DX., an exploding grenade, a tree, an ostrich with a spearhead in its beak and the emblem of the Order of the Ermine with the banner NOM MAI. The vine work is interwoven with putti, three oval panels on the left and three round panels on the right. The upper oval picture shows the author in the clothing of the bourgeois Florentine as a cartographer at work. He stands in front of a globe covered with golden stars with both hands busy on the upper hemisphere. Ptolemy's map of the world hangs on the wall of the room in the background. The middle one shows a cartographer pointing to the equator with the continents of Europe, Africa, and Asia clearly visible. Obviously, the miniaturist had initially considered placing an armillary sphere on the right in the background of this picture. It can still be seen under the overpainting. The lower oval shows Berlinghieri in a floor-length robe, sitting at his desk with several open books and a dark window in the background. The upper round panel on the right shows two young men in conversation sitting on a meadow under a tree with Florence on the background based on the depiction of the Florence Cathedral. The middle one is comparable but, in this miniature, Ptolemy appears from a cloud. The lower panel shows Ptolemy in the middle flanked by two Florentine men on a cloud, explaining the scenery to his companions, during their flight over the earth. Again, in the lower border, the coat of arms of the Montefeltro family is present.²¹ Then the different *libers* follow with the corresponding maps. The first page of each *liber* is decorated with floral motifs supplemented with putti, birds, animals, insects, and *candelabras* in various formats and gold heightened. The title and the enlarged first capital of each *liber* are gold heightened as

¹⁴ Op. cit. (n. 12).

¹⁵ Op. cit. (n. 1), pp. 146-53.

¹⁶ Skelton, op. cit. (n. 7), p. VII.

¹⁷ Op. cit. (n. 12).

¹⁸ Roberto Almagià, 'Osservazioni sull'opera geografica di Francesco Berlinghieri', *Archivio della R. deputazione romana di storia patria*, 68 (1945), p. 215.

¹⁹ Eleonora Azzini, 'Domizio Calderini e la recognitio tabularum Ptolemaei', *Tesi di Dottorato in Archivistica, Bibliografia e Biblioteconomia Università degli studi di Firenze*, M-STO/08 (2010), p. 141.

²⁰ Helas, op. cit. (n. 13), pp. 272-77.

²¹ Ibid, p. 273.



Fig. 725



Fig. 726

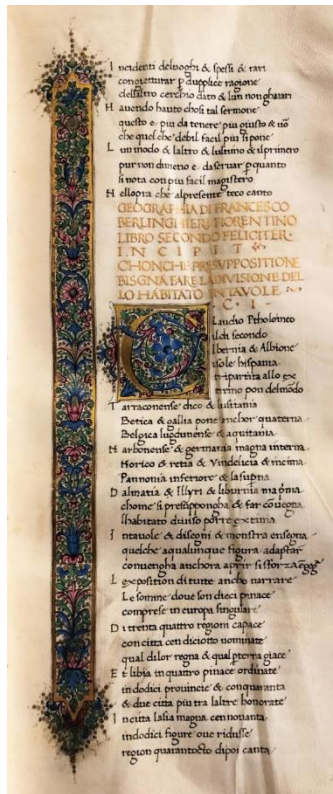


Fig. 727

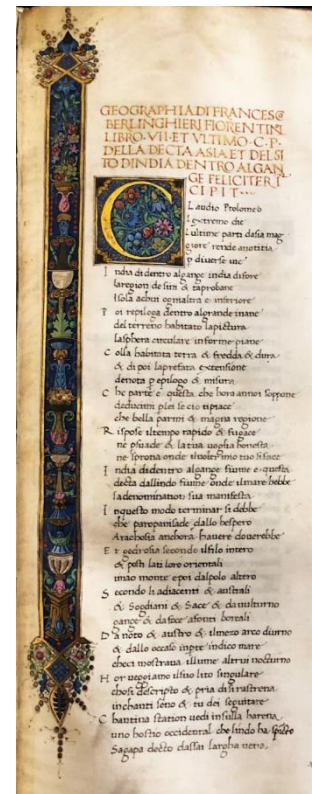


Fig. 728



Fig. 729

well. Additionally, the enlarged capitals are decorated with different motifs. On the maps, the sea, lakes, and rivers are coloured dark blue using lapis lazuli. The mountains are brown green and for the islands different colours are applied: cream, brown green, and pink red. The maps are framed by a gold heightened margin. The circles representing the places are also gold heightened. For the text on the maps the colours brown green, pink red, red, blue, and gold heightening are used.²²

Berlinghieri had a second manuscript of the *Geographia* made.²³ A *deliberazione of the signori*, dated November 28, 1495, informs us that he had presented this work to Lorenzo de Medici. It was later placed into the possession of the city after the expulsion of the Medici. Eventually, it passed into the collection of the Biblioteca Braidense in Milan by way of the counts Pertusati.²⁴ This Braidense manuscript has been re-bound with new protective sheets at the beginning and the end as described by Carta.²⁵ The first sheet is in terms of its design on the recto like the fourth sheet of the Vatican copy. However, the miniatures and decorations are different and focused on the Medici instead of on Federico d'Urbino (Fig. 724). In the capital G of the richly ornamented first page we see Berlinghieri writing his poem in his study.²⁶ In the surrounding frieze there are three oval miniatures on the left and three round ones on the right. At the bottom we see the coat of arms of the Medici. The ribbon in the middle contains several Medici symbols, with in the middle the Florentine lilies. The oval miniatures contain a scholar studying maps and the globe. The round miniatures show Florentines in different compositions with Florence in perspective in the background. According to Carta in the middle one Lorenzo de Medici and Clarice of Orsini are depicted (Fig. 724).²⁷ The scenes depicted in all the miniatures are very similar to those in the Vatican manuscript. The frieze also contains several cherubs, some of which have a very transparent veil. According to Carta, the miniature painter is certainly Florentine. The way of drawing and colouring is reminiscent of Attavante.²⁸ The titles of all Libers are in gold except for Liber Primus. Liber Primus starts on the recto of the first sheet of this copy due to the absence of the apologue of Ficino as present in the printed copy of the *Geography*. On several pages we found traces applied by the copyist probably as a reminder of where he had paused (Fig. 725-26). The text pages in the atlas are beautifully decorated with illuminated capitals, golden letters and gold heightened friezes decorated with floral motifs and *candelabras* at the beginning of each liber (Fig. 727-28). The maps are lavishly coloured. The titles are in gold and the water parties are coloured deep blue using lapis lazuli. Some maps contain three golden lilies in the banderole at the top of the map. They are surrounded by a golden border. The cities in this manuscript are represented by city vignettes with towers highlighted in gold instead of gold heightened circles as in the Vatican manuscript. The mountains are yellow to gold brown. In contrast to the Vatican manuscript the islands are not coloured. The woods, not present in the Vatican manuscript are coloured green (Fig. 729). For the text on the maps the colours brown green, pink red, red, blue and gold heightening are used.

Illuminated copies of the printed edition: the *Geography*

Both manuscripts and several printed copies of Berlinghieri's *Geography* are a wonderful example of the transition from manuscripts to the printed book and the intermediate coexistence of both types of publications at that time. The illumination and colouring of printed copies of the *Geography* individualised the atlases and added prestige and value.²⁹ They are an example of the fluid transition from manuscripts to printed editions and show a definite relation to the two above described

²² Op. cit. (n. 12).

²³ Op. cit. (n. 7), p. VI.

²⁴ Op. cit. (n. 13), p. 272; In the decree, the *signori* demand the return of the apparently borrowed or stolen book within three days. It is unclear whether this call was successful. The manuscript may have already come into French possession at that time.

²⁵ Carta, op. cit. (n. 8), p. 93; It lacks the three sheets with the devotion to Federico, his son Guido and the title page. That makes sense as it was intended for Lorenzo de Medici.

²⁶ Op. cit. (n. 8), p. 94.

²⁷ Ibid, p. 95.

²⁸ Ibid, pp. 95-6.

²⁹ Sean Roberts, *Cartography between cultures: Francesco Berlinghieri's Geographia of 1482* (Michigan 2006), p. 150; Sean Roberts, *Printing a Mediterranean world: Florence, Constantinople, and the renaissance of Geography* (London 2013), pp. 23, 108.

manuscripts. The first example concerns a copy in Istanbul.³⁰ It is printed on paper but also contains a parchment leaf. The copy is accompanied by a letter from Berlinghieri, described by Almagià, Jacobs, and Babinger.³¹ It has the text and maps of the printed version with some differences in the preliminary leaves. The title is on the recto of the first sheet, the verso is blank. The second leaf has been replaced by a parchment one. On the recto side the regional index is present. An undated letter from Berlinghieri can be found on the verso. Both are in manuscript. In the heading, this letter is addressed to Sultan Mehmed II. The text is addressed to his son Bayezid. On the third printed leaf the original dedication to Federico is covered by a similar dedication to Sultan Mehmed II. It is painted in golden letters on a blue background. In short, all dedications to Federico of Urbino have been replaced by Sultan Mehmed II or Bayezid. In the summer of 1484, a second presentation copy of Berlinghieri's *Geography* was sent to Cem. He was the other son of Sultan Mehmed II and half-brother of the new Sultan, Bayezid. This presentation copy intended for Cem is currently preserved in Turin.³² It fortunately escaped the devastation caused by the fire that hit the library in 1904. Later, the atlas was also saved from air strikes that caused significant damage during the Second World War.³³ On the verso of the first leaf Cem's name was apparently painted to replace Federico's in the title. Like Bayezid's copy, it contains a letter on parchment in manuscript form, dated May 31, 1484 (Fig. 716). This is a substitute for the second leaf of the printed version.³⁴ In the header of the text on the third leaf the devotion to Cem is illuminated in manuscript form, golden letters on a red background (Fig. 721). The rest of the page is printed as in Bayezid's copy.³⁵ The Fries and miniatures on this page are in Islamic style, different from those in the Vatican and Braidense manuscripts, probably because of the Islamic ban on images of people (Fig. 721).³⁶ According to Almagià, the illumination of the two copies for Cem and Bayezid is attributed to a miniaturist from the same school, as the one who illuminated the two manuscripts of Berlinghieri's *Geographia*.³⁷ The text pages of Cem's copy are illuminated with inhabited gold heightened initials surrounded with a floral design at the beginning of most libers and with the guide letters enlarged and coloured blue in the first part of the text only. The maps are illuminated comparable and as lavish as those in the manuscripts (Fig. 722).

In the next group of atlases no parchment additions were applied. In a copy in Florence, from the Biblioteca Medicea Laurenziana, the recto of the third sheet was illuminated with a frieze and a historiated initial with the figure of Berlinghieri in his office (Fig. 730).³⁸ It was executed more modestly than in the two manuscripts but comparable to Cem's copy. The first capital of each liber was characterized by a gold heightened and coloured capital with a floral design. The capital was further decorated and enhanced with a gold heightened and coloured floral motif as in the manuscripts, but smaller and simpler. A simple banderole is applied around the title of each liber. The guide letters are enhanced and coloured blue. The maps are coloured comparable and as luxurious as in the two manuscripts with extensive use of lapis lazuli and gold heightened margins around the maps. Another richly illuminated and coloured copy can be found in Rome.³⁹ The recto of the third sheet is sumptuously illuminated like that of the Braidense manuscript but only four instead of six miniatures are shown. The coat of arms of the Medici family has been replaced by that of the Pucci family, the first owners of this atlas (Fig. 731).⁴⁰ Carta believes that the miniaturist may be the same as the one of the two manuscripts,

³⁰ Topkapi Sarayı Müzesi Müdürlüğü, shelfmark G.I.84.

³¹ Almagià, op. cit. (n. 18), p. 226; Franz Babinger, 'Reliquiensbacher am Osmanenhof im XV. Jahrhundert', *Bayerische Akademie der Wissenschaften*, 2 (1956), p. 22; Emil Jacobs, 'Zur Datierung von Berlinghieris *Geographia*', *Gutenberg Festschrift*, (1925), p. 250.

³² Biblioteca Nazionale Universitaria di Torino, shelfmark XV.I.42.

³³ A facsimile edition is published by the Consiglio regionale del Piemonte, Biblioteca Nazionale Universitaria di Torino, Centro Studi Piemontesi, Fondazione CRT, *Berlinghieri Geografia* (Torino 2006).

³⁴ It is understandable that in the atlases for Bayezid and Cem, this leaf was removed because it contained the dedication to Federico d'Urbino. It is replaced by a parchment leaf with a letter to respectively Bayezid and Cem in both copies. The regional index is only added in Bayezid's atlas.

³⁵ Op. cit. (n. 7), p. VII.

³⁶ Op. cit. (n. 13), p. 278.

³⁷ Op. cit. (n. 18), pp. 220-21.

³⁸ Biblioteca Medicea Laurenziana, shelfmark Inc.I.5; Mario Tesi, *Monumenti di cartographia a Firenze sec. x-xvii* (Florence 1981), p. 46.

³⁹ Biblioteca Nazionale Centrale di Roma, shelfmark 70.1.G.5.

⁴⁰ Op. cit. (n. 8), p. 99.

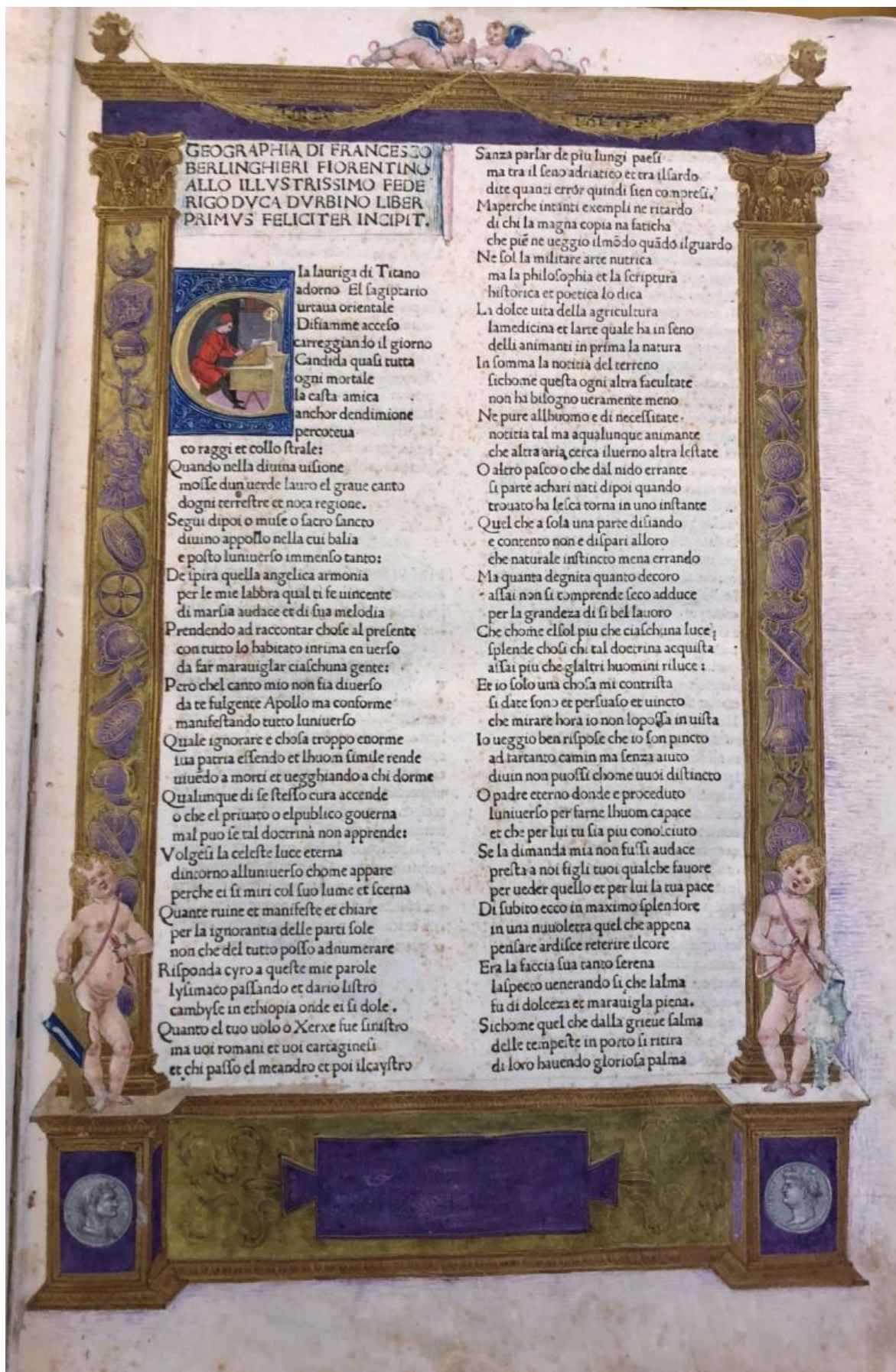


Fig. 730



Fig. 731



Fig. 732

or rather, a less talented miniaturist who strictly followed the model.⁴¹ The illumination of the text pages has been executed in a modest manner. A basic banderole is applied around the title of each liber and the guide letters on the text pages are enlarged and coloured blue. The maps are illuminated comparable and almost as precious as those in the manuscripts, except that no gold was applied (Fig. 732). A second atlas in Rome was made for Christoforo di Giustinopoli, Generale dei Servi di Maria.⁴² It is the only copy of which the artist and the year of execution are known. The miniaturist Bartolomeo di Pagolo was paid for painting and illuminating the text pages of this copy of the *Geography* and Berlinghieri for the colouring of the maps, in 1486.⁴³ According to Carta it has also belonged to the library of the Dukes of Urbino. This can be seen in the syllable *Ur.* in the right corner of the edge of the first page.⁴⁴ The recto of the third sheet was illuminated again but more modestly (Fig. 719). The initial *G* in this atlas contains Berlinghieri with a book in his hand. At the bottom we find the motto of Giustionopoli *Da Gloriam Deo*. In the rim to the left of the initial *G* we see two candlesticks with flames. Carta stated that it is an ornament that Attavante often used. The illumination of the text was more mundane with only enlarged and blue coloured guide letters. The maps were illuminated and coloured extensively and costly, very comparable to those of the Pucci copy (Fig. 720).

Traces of illuminations, the presence of coats of arms of previous owners, or colouring of the maps were found to some degree in almost all first edition atlases included in our study. The extent of the applied illumination and gilding, as well as the application or absence of lapis lazuli and gilding in the colouring of the maps seems to be related to the importance of the buyer, owner, or dedicatee of the specific copies. The illumination of the text diminished first or was not present anymore at all, where the colouring of the maps became more modest in the copies intended for less eminent people. In the end, all illuminations and colouring have disappeared. We did find copies with uncoloured maps belonging

⁴¹ Ibid, p. 99.

⁴² Biblioteca Universitaria Alessandrina, shelfmark Inc.541.

⁴³ Tauci, op. cit. (n. 10), p. 72.

⁴⁴ Op. cit. (n. 8), p.99.

to the first as well as the second print run of the first edition.⁴⁵ In our opinion, this is characteristic of this period marked by the transition from manuscripts to printed copies. The development from and interaction between illuminated and coloured manuscripts to printed copies is reflected by the *Geography* described above. Berlinghieri's *Geography* was born at the intersection of these two methods to produce books. The atlases printed by Giunti are usually uncoloured although a coloured example was found.⁴⁶

Comparison of the text of the *Geographia* and the *Geography*

The text of Berlinghieri's *Geography* is written in vernacular language as opposed to Latin, which was common at the time. It has been applied in both manuscripts and the printed version. Carta claimed that the content of the manuscript, both for the maps and the text, does not differ from the printed edition of the book and that the spelling is slightly improved in the printed version but not substantially different.⁴⁷ Almagià compared the text of the Braidense manuscript with that of the printed copy.⁴⁸ He concluded, just like Fischer, that it is very similar. It also applies to the text of the manuscript in the Vatican.⁴⁹

Based on our findings, we believe that Berlinghieri's personal text in *terza rima* and vernacular language in his own handwriting must have been used for the text of both manuscripts and the printed edition. We already proved that the printing of the *Geography* started with Liber Quartus. Most likely because the first three libers were with the copyist of one of the two manuscripts. It indicates that only one copy with Berlinghieri's personal text was available. Therefore, the different libers with his text must have been exchanged between the two copyists and the printer, each in his turn. This method is in line with that of Vespasiano da Bisticci. King described that he regularly used several copyists who were all given a part of the text to transcribe in order to speed up the process of reproduction.⁵⁰ The same method of working may also have been applied in the event that multiple copies were desired as was the case with Berlinghieri's *Geographia* and *Geography*.

Despite the fact that a unique working manuscript written by Berlinghieri was used, Almagià described that differences and small inconsistencies have been found in both manuscripts and the printed version.⁵¹ According to King this is usual.⁵² Copyists sometimes had to decipher centuries-old manuscripts in a different script than they were used to. The documents also contained abbreviations and hyphenations that were sometimes difficult to interpret. And even the most attentive copyist could skip a sentence or an entire paragraph if his eye accidentally fell on a word or phrase further up that resembled what he had just transcribed. Such an involuntary glance is called parablepsis. Some monasteries exercised strict quality control over their manuscript production to avoid this kind of inaccuracy.⁵³ Dilke and Dalché described this also and reached the same conclusions.⁵⁴

We decided to compare a few text pages of both manuscripts and the printed issue in more detail in order to interpret the differences. We have selected the three preliminary leaves for the comparison because these were printed lastly. The first page of Liber Secundus was also studied because it was present in both manuscripts and the printed edition (Fig. 727). Apart from a single word or a reversal of words, no differences were found in the text of the two manuscripts and the printed version (attachment seven). However, we did find small differences based on interpretation, copying, typesetting, and spelling

⁴⁵ National Maritime Museum, shelfmark PBD 7690; Biblioteca Casanatense, shelfmark Vol.Inc.1110; Biblioteca Nazionale Marciana, shelfmark Inc. 0037; Biblioteca del Museo Correr, shelfmark Inc. D.013.

⁴⁶ Bibliothèque nationale de France, shelfmark C 2035 9.

⁴⁷ Op. cit. (n. 8), p. 97.

⁴⁸ Op. cit. (n. 18), p. 226.

⁴⁹ Fischer, op. cit. (n. 6), pp. 381-85.

⁵⁰ Op. cit. (n. 1), p. 104.

⁵¹ Op. cit. (n. 18), pp. 215-16, 251.

⁵² Op. cit. (n. 1), pp. 103, 425.

⁵³ Ibid, p. 103.

⁵⁴ Oswald A.W. Dilke, 'Chapter 11 The culmination of Greek cartography in Ptolemy', *The History of Cartography Volume one* (Chicago 1987), pp. 180, 192; Oswald A.W. Dilke, 'Chapter 15 Cartography in the Byzantine empire', *The History of Cartography Volume one* (Chicago 1987), p. 271; Patrick G. Dalché, 'Chapter 9 The reception of Ptolemy's *Geography*', *The History of Cartography Volume three* (Chicago 2007), pp. 291, 295, 340-41.

errors.⁵⁵ Apart from these imperfections we also found a different use of et, &, or e in both manuscripts and the printed edition on the first page of Liber Secundus. Therefore, we compared the first page of each liber regarding the use of et, &, or e.⁵⁶ In the Vatican manuscript and the printed edition et and & were applied somewhat irregularly.⁵⁷ In the Braidense manuscript ET was used consistently at the beginning of each sentence. If it was applied in the sentence, then & or e was used. These findings are shown in attachment seven. According to us, both manuscripts have a different handwriting based on visual comparison. We think this is confirmed by the different application of et, &, and e in both manuscripts. It must be based on a personal preference of the copyist. This may also apply to another difference that we found in the use of the headers at the top of the pages. In the Braidense manuscript, no header is used, whereas in the Vatican manuscript, the L is shown on one page and the number of the relevant liber, for example III, on the opposite page with one or two omissions (Fig. 727-28). In the printed edition the headers are applied more extensively, e.g. *LIBER TERTIVS*.

We want to conclude the comparison of the text pages by describing some differences in the composition of both manuscripts and the printed copy. Only the Vatican manuscript contains the *apologia* to Federico's son Guido concerning Federico's death. In the Braidense manuscript it is lacking, like all other references to Federico, which is not illogical given that this copy was intended for Lorenzo de Medici. In this manuscript the title page is unfortunately missing. Therefore, it is not possible to say with certainty what else may have been present and has been lost. The printed edition contains the same text as the Vatican manuscript except for the *apologia* to Federico's son Guido. However, some parts of text are positioned slightly differently. Based on the great similarities and the randomness and nature of the inconsistencies found we conclude that there has indeed been only one working manuscript for both manuscripts and the printed edition written by Berlinghieri.

Comparison of the gazetteers of the *Geographia* and the *Geography*

Berlinghieri wrote the regular text in vernacular language. It was also applied for the topographical names in the gazetteers insofar as they were known.⁵⁸ It must have been easier and more reliable for the Mediterranean places and probably impossible for distant places in, for example, Asia. We compared the complete gazetteers belonging to two maps of the Vatican and Braidense manuscripts and the printed edition of the *Geography* like some text pages in the previous section. We chose the maps *TABVLA SEPTIMA DE EVROPA* and *DVODECIMA D ASIA* as an example of a Mediterranean known area and a distant probably less familiar region. The toponyms with their coordinates were listed in columns and more or less in alphabetical order. This is different from the method applied in the 1478 Rome and 1482 Ulm *Cosmography* editions, in which the toponyms are part of the regular text and not placed in alphabetical order. Furthermore, in the Rome edition it starts with a toponym at the top of the island followed by those along the coast in a logical instead of an alphabetical order. Next the names of the mountains and the toponyms in the interior and finally the names of the islands are presented. The working method in the Ulm edition is very similar.

An overview of the comparison is presented in attachments eight and nine. Again, we did find differences which can be attributed to interpretation, copying, typesetting, and spelling errors comparable to our findings about the regular text. Besides the complete comparison of the gazetteers of these two maps, we also checked the first and last toponyms belonging to each map in the gazetteers of both manuscripts and the printed version. In the Vatican manuscript, the first toponyms in the gazetteer of the fifth map of Europe and the ninth one of Asia are listed in a different order.⁵⁹ The same applies to the last toponyms belonging to the first map of Asia. In addition, some of them are missing in the gazetteer of this map and the fourth and fifth maps of Asia in the Vatican manuscript. On the other hand, at the end of the gazetteer of the eleventh map of Asia, the Vatican manuscript contains additional

⁵⁵ Probably, we have made them too in our attachment. Reading the handwritten texts, we also may have interpreted letters wrongly and made copying and typing errors but that does not undermine the overall impression and conclusion.

⁵⁶ A complete example of the printed version can be found on the website: <https://gallica.bnf.fr/ark:/12148/btv1b55007623j/f1>; The complete Vatican manuscript can be studied on the website: https://digi.vatlib.it/view/MSS_Urb.lat.273

⁵⁷ Op. cit. (n. 12).

⁵⁸ Op. cit. (n. 18), pp 228-32, 250-51.

⁵⁹ Op. cit. (n. 12).

toponyms. Randomly, the gazetteers of a few more maps were checked more extensively. Several examples were found of missing or additional toponyms in the Vatican manuscript compared to the Braidense manuscript and the printed edition as well as the opposite. The latter two seem to be more similar in this respect. Toponyms in the wrong order may indicate carelessness on the part of the copyist or typesetter. We found a very clear example of a mistake by the copyist in the Vatican manuscript. On one page a whole series of toponyms belonging to the second map of Africa were additionally written between the gazetteer of the ninth and tenth map of Europe.⁶⁰ Comparable to the printed version in which no sheets of paper containing errors were replaced or discarded, this sheet of parchment was not replaced either. In addition, we also found traces of corrections and editing in the gazetteers of both manuscripts as well as in the gazetteer of the printed edition, e.g., the already described toponym Thyle. These deviations in the order of, as well as missing and extra toponyms found in the gazetteers, are possibly due to ambiguities, corrections, or plain carelessness of both copyists and the typesetter and possibly shortcomings in Berlinghieri's working manuscript.

We found another anomaly regarding the headers as already described in the previous section. In each of both manuscripts as well as in the printed edition the headers were applied similarly in the gazetteers and the regular text, but in all three distinct. The fact that the headers are applied differently in the Vatican manuscript compared to the printed issue and that they are even absent in the Braidense manuscript might indicate that they were not present in Berlinghieri's original text either. Possibly, both copyists and the typesetter applied them as they considered appropriate. In chapter five on the text, we already described the many errors found in the headers of the various *libers* of the printed edition. The absence of headers in Berlinghieri's working manuscript could be a good explanation for this, in addition to the fact that they were printed one after the other from *Liber Secundus* to *Sextus*. Without the presence of a header in the text to be copied, a correct implementation must have been very difficult.

Besides the different application of headers we would like to emphasise another difference we have found. It concerns the naming of the different maps in the gazetteers of both manuscripts and the printed version. In the printed edition the maps are named the first, the second and so on of Europe, Africa, and Asia (attachment four), with the titles for the maps Europe six and Asia five and six missing. The naming applied in the Braidense manuscript was quite comparable with one exception. The titles for the maps Asia two to nine are missing and the title for the map Asia one seems to have been added later in a different style and handwriting. In the Vatican manuscript the disparities become more pronounced. The first five maps of Europe are named more or less similar except the fact that abbreviations have been used for the numbers, e.g. *scda* and *qnta* instead of *secunda* and *quinta*. The seventh to tenth maps of Europe are named similarly to the printed ones and those in the Braidense manuscript. In the Vatican manuscript the numbering of the maps does not restart at number one in Africa, but counts up from Europe, e.g. *TAVOLA DVODECIMA DAFRICA*. In Asia only a numbering in Roman numerals was applied without the addition of the word Asia, e.g. *TABVLA .XXII*. The one for the first map of Asia is missing. Despite this omission, the numbering was applied correctly for the second map of Asia and the following ones. Notwithstanding many small and random differences found based on mistakes and misinterpretations made by the copyists and typesetter, probably only one working document written by Berlinghieri was used. We would like to highlight a very specific example in support of this. The missing denomination of the map *TABVLA SEXTA D EVROPA*, Italy, in the Braidense manuscript as well as in the printed edition, and the deviating title *TAVOLA DEL TERZO LIBRO PRIMA* applied in the Vatican manuscript, is in our opinion a clear indication that the name of this map must have been missing in the original working manuscript. This is very specific and special. It is virtually impossible that it could have been present in three different working documents in case there had been three. Given the three differently applied denominations for the maps in Asia, these also may have been lacking in the working manuscript. This missing identification of the maps may already have started in Africa based on the different naming of these maps applied in the Vatican manuscript (attachment four).

⁶⁰ The same toponyms are written again further on in the gazetteer with reference to the map *TAVOLA DVODECIMA DAFRICA*.

The maps of the *Geographia* and the *Geography*

Like the text, we also compared the maps of both manuscripts and the printed edition. At first glance, the general picture of all the maps is very similar except for the three modern maps and the one of the Holy Land of the Vatican manuscript.⁶¹ Additionally, there are noticeable differences in style between each of the manuscripts and the printed edition. Studying the maps in more detail we found many differences between those belonging to the two manuscripts and the ones in the printed edition. We searched for correlations between the printed edition and both manuscripts that might indicate that the printed one was based on either manuscript. We were not able to establish this. In some examples the printed edition was more consistent with the Vatican manuscript, in others more with the Braidense one. We have also tried to trace the described state differences back to the manuscripts. That was not possible either. Some state differences cannot even be traced back to both manuscripts. This suggests that other sources have been used as well. Some differences could be traced back to mistakes made during the production of the copper plates.

First, we will present some examples. On the right half of the map *TABVLA OCTAVA DE EVROPA* in the upper right corner a mountain range with a river flowing from it is present on the map in the Vatican manuscript. It is missing on the one in the Braidense manuscript, but it is present on the printed map. A mirror image of this mountain range is found on the printed map in the second state in the upper left corner on the left half of the map (Fig. 506, 614-15). It clearly concerns an engraving error which was masked or wiped clean on the printed maps in the first state. On the right half of the map *TABVLA NONA DE EVROPA* in the lower right corner an indentation of the sea is present in the land mass next to the region *Parte De Asia Propria* in the Vatican manuscript. It is not found in the Braidense manuscript nor in the first and second state of the printed version. However, the indentation is engraved on printed maps in the third state although only the contours are visible without any further detailing of the sea (Fig. 624-26). A larger land mass or island is present on the right half of the map *TABVLA DECIMA DE EVROPA* in the upper right corner below the region *Parte De Asia Propria* in the Braidense manuscript. It is also found on the printed map in the first state but missing in the Vatican manuscript. More to the left closer to the mainland of Greece on the Braidense manuscript a star-shaped island can be found. This island is also lacking in the Vatican manuscript. In the printed version it can only be detected on maps in the second state (Fig. 627-28). On the maps *GALLIA NOVELLA* and *TABVLA QVARTA DE EVROPA* woods are present in the Braidense manuscript as well as in the printed edition but not in the Vatican manuscript (Fig. 520-22, 729). On the left half of the map *TABVLA QVINTA DE EVROPA* in the middle the shape of the contours of the *Adriatico Seno* are more or less the same in both manuscripts and on maps of the printed edition in the first state. On those in the second and third state an additional non-shaded contour of the sea in the mainland is present (Fig. 596-98). We detected this specific contour also in manuscripts present in the Vatican Library.⁶² Another very specific characteristic was found in the title of this map in the Braidense manuscript. Here *DE ERVPA* is painted (Fig. 733). We

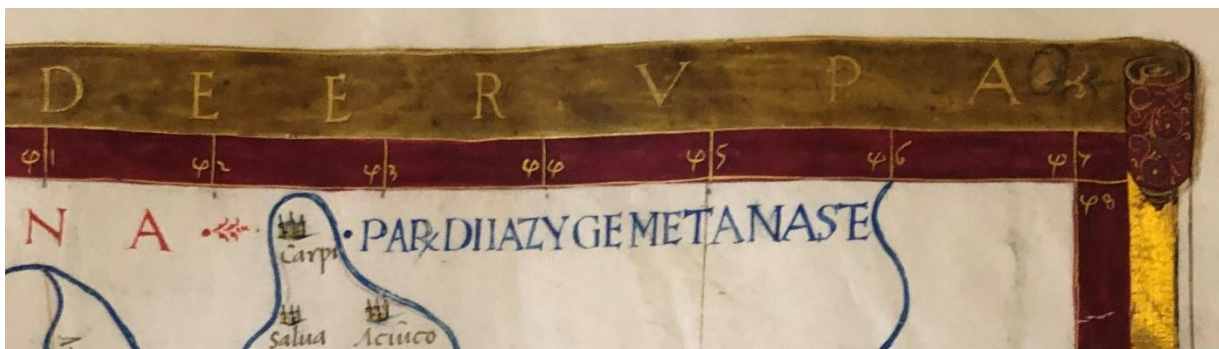


Fig. 733

⁶¹ Op. cit. (n. 12).

⁶² Vat.Lat.5699 with maps by Hugo de Comminellis di Mezieres and Pietro del Massaio, 1469: <http://www.mss.vatlib.it/gui/scan/link1.jsp?fond=Vat.lat.>; Urbinas Graecus 82 copy of Chrysoloras, drawn up by the Patriarch of Alexandria, Athanasius the Younger, for Emperor Andronicus II Palaeologus, 1282-1328: <http://www.mss.vatlib.it/gui/scan/link1.jsp?fond=Urb.gr>.

did not find this in any other manuscript or printed edition of the *Cosmographia*. However, in the second state of the printed edition of Berlinghieri's *Geography D EVROPA* is changed into *DE ERVPA* and back into *D EVROPA* on maps of the third state with the corrections visible in the letters (Fig. 593-95). This seems to be a strong indication that this adaptation of the copper plates is based on a comparison with the Braidense manuscript. A last feature we want to discuss concerns a finding on the map *TABVLA DECIMA D ASIA*. In the Vatican manuscript the image of this map is extended with two or three centimeters on the top comparable as found in other copies of the *Cosmographia*.⁶³ We detected more and other examples that substantiate the same but it is not feasible nor relevant to discuss all of them. The findings described above in some cases suggest a relation between the printed edition and the Vatican manuscript as well as an adaptation of the printed version resulting in a new state which probably is related to the Vatican manuscript and in other cases to the Braidense manuscript or even other manuscripts than Berlinghieri's *Geographia*'s. Our findings correspond with those of Fischer.⁶⁴ Amongst many others he described that a striking feature of Berlinghieri's world map is the inclusion of the eclipse on the map (Fig. 734). Berlinghieri also added the signs of the zodiac. They can be found in the Braidense



Fig. 734

manuscript and the printed edition. In the Vatican manuscript the zodiac is missing, as well as the title of the world map. Fischer is of the opinion that the Braidense manuscript and the printed version are the most similar. Almagià also believes that the printed version looks more like the Braidense manuscript with respect to the maps, especially the four modern maps.⁶⁵ Nevertheless, he states that there are many examples on the maps where alternately the Braidense manuscript and the Vatican manuscript look more like those of the printed edition. Therefore, Almagià thinks that another manuscript served as an example for the printed version, but it must have looked more like the Braidense manuscript. The phenomenon of observations pointing in several directions has also been described more recently in books on

⁶³ Ibid.

⁶⁴ Op. cit. (n. 6).

⁶⁵ Op. cit. (n. 18), p. 227.

Ptolemy's *Cosmographia*.⁶⁶ Therefore, it does not seem to be possible to clarify the issue by means of mutual comparisons. The question then arises as to how they can be understood and explained?

Despite all the differences, the fact remains that the maps in both manuscripts and the printed version are very similar. Striking features on Berlinghieri's maps are the very winding rivers and the depiction of the mountain ranges, the alternating widening and narrowing of them without shadow effect, as already described by Fischer.⁶⁷ These are depicted comparably on the maps in both manuscripts and the printed edition. In chapter six on the maps, we described the mysterious presence of circles in the corners of the printed maps (Fig. 509). They brought us the idea that they may have served as a tool for superimposing and copying a template. To test this assumption, we superimposed images of maps in private collection on images from the Vatican manuscript that could be downloaded from the internet with the help of Adobe's photoshop.⁶⁸ The match was remarkable for the maps that matched at first sight. That does not apply to the modern maps, the one of the Holy Land, and the world map. For our next visit



Fig. 735

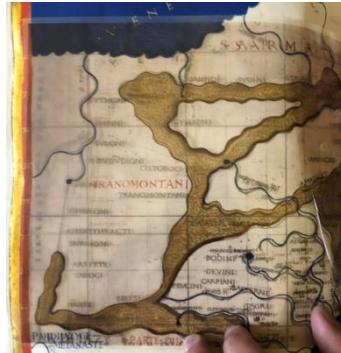


Fig. 736



Fig. 737



Fig. 738

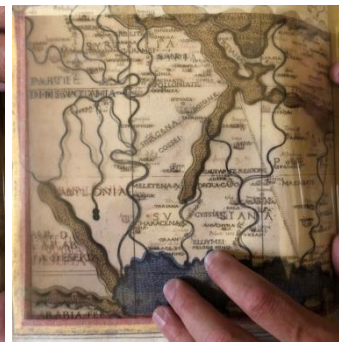


Fig. 739

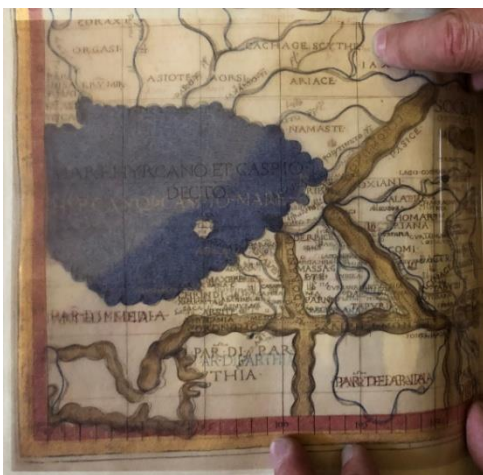


Fig. 740



Fig. 741

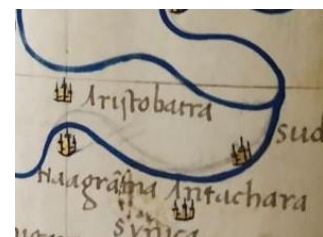


Fig. 742

⁶⁶ Renate Burri, *Die Geographie des Ptolemaios im Spiegel der griechischen Handschriften*, (Berlin 2013), pp. 44-5, 49-55; Alfred Stückelberger, Florian Mittenhuber, *Klaudios Ptolemaios. Handbuch Der Geographie*, (Basel 2009), pp. 7, 69, 74.

⁶⁷ Op. cit. (n. 6), pp. 377-78.

⁶⁸ Op. cit. (n. 12); With the help of Don Monfils, architect.

to Milan, we made transparent copies of seven maps in private collection. In the Braidense Library we were allowed to superimpose them on the maps of the manuscript with a protective transparent sheet of paper in between. They matched perfectly when applied to the contours of land masses, rivers, mountain ranges and towns (Fig. 735-41). Two completely different techniques were applied to produce the maps. The ones in the manuscript are painted and those of the printed version are engraved. The good fit is only possible and explainable if one and the same template was used. It was probably copied first to the parchment or copper plate and then either painted or engraved. Proof of this was found on the map *TABVLA DECIMA D ASIA* where the applied curves of the rivers from the template were not exactly followed by the illuminators and engravers in both manuscripts as well as the printed edition (Fig. 688-89, 742). Next, the toponyms must have been inserted that were linked to the circles already set up for the towns. Finally, the names for the larger regions and the like must have been added. If that had been done before the toponyms were applied, they might have gotten in the way.

The different stages of this way of working have been found in a manuscript in the Bibliothèque nationale de France.⁶⁹ In this manuscript examples of maps were found in different stages of development from the first draft to being completely illuminated. Also in the Braidense manuscript, on the back of the map *TABVLA NONA D ASIA*, an example of a map in an early stage of development was present. The same procedure has been applied for the printed edition. We detected that mistakes were made in the transcription process. Each of the two manuscripts lacks mountain ranges that should have been there. These seem to be examples of omissions in the tracing. A double mountain range is painted on the right half of the map *TABVLA SEPTIMA DE ASIA* in the Vatican manuscript a little below the middle of the page. In the Braidense manuscript and the printed edition, the right one is depicted as land between two rivers instead of a mountain range (Fig. 743-44).⁷⁰ This looks like an interpretation error by the artist who painted this map in the Vatican manuscript. These imperfections are like those made in the text where, for example, toponyms have been forgotten or words have been copied incorrectly from the working manuscript.



Fig. 743



Fig. 744

Earlier in this chapter we described the complete comparison of toponyms in the gazetteer of two maps (attachment eight and nine). They also show the toponyms that we found on the maps themselves. The similarities with the toponyms in the gazetteer are significant, yet more differences and deviations were observed between the toponyms on the maps of both manuscripts and the printed edition compared to those present in the gazetteers. These attachments also show the names of the seas, the larger areas, and regions on the maps. These larger areas and regions are not included in the gazetteer for the corresponding map. It is noteworthy that they show the greatest deviations. According to us, this can only be explained if they were directly copied from maps of several and different codices or working templates. This working method must also have been used for the toponyms. It was very impractical to copy them from the gazetteer. If that had been applied there should have been fewer differences between the toponyms on the maps and those in the gazetteer. This procedure implies that each toponym must

⁶⁹ Grec 1402, second half fifteenth century: <http://gallica.bnf.fr/ark:/12148/btv1b6000512m>

⁷⁰ Op. cit. (n. 12).

be placed on the map with the help of its coordinates to the appropriate spot in the form of circles or walled places. That would have been very laborious with a high probability of errors. It is much easier, faster, and more accurate to copy them from an existing map or working template. The very winding rivers and the curved shape of the coastlines are very characteristic and distinctive for Berlinghieri's *Geography* and *Geographia*. This was also noticed and described by Fischer.⁷¹ In our opinion, the findings support the described procedure. Our superpositions also show that the toponyms have not been copied directly from the working template. Therefore, we think that they have been copied from maps that served as example rather than from the gazetteer. This is confirmed by the modern maps and the one of the Holy Land. The toponyms on these maps are not present at all in the gazetteers just like the names of the seas and larger areas and regions. So, they really must have been copied from another source. With both manuscripts and the printed version being worked on at the same time, there must have been several different sources available for the detailed completion of the maps for each of the three copies. This explains why the largest deviations were found in the names of the seas, the larger areas, and regions. This procedure does not seem to have been exclusive to Berlinghieri's *Geographia* and *Geography*. As mentioned before, we also studied the same two maps and their toponyms in the text in the Rome 1478 and Ulm 1482 editions of the *Cosmography*. Not all the toponyms on these maps were found in the text and vice versa, comparable to Berlinghieri's *Geographia* and *Geography*. Additionally, the usual differences and variations in spelling were present between the toponyms in the text and those on the maps. All this makes it clear why Fischer and Almagià failed in their search, based on the observed differences, for the master manuscript. Obviously, the working method was not evident to them. It is relevant to understand this because it clarifies both the significant perceived similarities as well as the detected variations.

In the previous paragraphs we have shown by the superposition of transparent copies on the Braidense manuscript and by superimposing photographs of printed maps on the Vatican manuscript that the correlating maps are based on one and the same working template. That does not apply to the modern maps which are clearly different in the Vatican manuscript. The world map is also different in both manuscripts but less noticeable. Almagià has described that the Braidense manuscript is based on a codex located in Florence.⁷² He probably justified that on the apparent similarities between the maps at first sight. The modern maps in the, according to him, older Vatican manuscript must have been derived from a manuscript with these maps designed to the third revision by Germanus as described in chapter one (Fig. 3-7, 41-44). This projection method is also applied for the modern maps in the Ulm 1482 *Cosmography* edition. In the Biblioteca Laurenziana in Florence another and older codex is present with modern maps in the projection according to the third revision by Germanus which are very similar to those found in the Vatican manuscript.⁷³ In Almagià's view the printed edition of Berlinghieri's *Geography* is younger than the two manuscript copies. It most closely resembles the Braidense manuscript including the modern maps. Nevertheless, based on the differences found, Almagià assumes that the printed edition was derived from a third codex which must have been very similar to the Braidense manuscript.⁷⁴ We do not agree with Almagià's assumptions. A closer comparison of the codex present in the Biblioteca Laurenziana with the two manuscripts of Berlinghieri's *Geographia* and his printed edition of the *Geography* reveals considerable differences. Therefore, this codex in the Laurenziana library cannot have been copied from the same working template as most of the maps of Berlinghieri's printed edition and his two manuscripts, which must have been in production at the same time instead of one after another as described by Almagià. We will elaborate on the timeframe in the next section.

Given the variations found, the details on the maps cannot originate from an identical working template for all three versions. It is therefore likely that several working examples or codices were used for the detailing of the maps as both copies of the *Geographia* and the printed *Geography* were created

⁷¹ Op. cit. (n. 6), pp 377-78.

⁷² Biblioteca Medicea Laurenziana, shelfmark Plut.30.1: <http://mss.bmlonline.it/?&search=plut.30.1>; Op. cit. (n. 15), p. 250; According to Azzini this manuscript can be dated about 1480, Azzini, op. cit. (n. 19) pp. 92-3.

⁷³ Biblioteca Medicea Laurenziana, shelfmark Plut.30.4: <http://mss.bmlonline.it/?&search=plut.30.4>; According to Azzini this manuscript can be dated about 1468-1471, Azzini, op. cit. (n. 19), p. 95.

⁷⁴ Op. cit. (n. 18), pp. 250-52.

simultaneously. The appearance of the maps is like contemporary codices, but they have been adapted in such a way that they have a unique and instantly recognisable graphic expression. It is almost as if Berlinghieri wanted to create a new personal release of the *Cosmography*. He may have commissioned a local workshop or studio to update an existing working example to his liking to be able to offer a unique copy to the dedicatee and other high-ranking persons. This finding is earlier described by Lago who suggested that Berlinghieri must have used a cartographic base bought from a workshop of copyists and cartographers in Florence.⁷⁵ Dalché wrote that there are differences in the techniques of representation used in manuscripts. It appears that the painter switching models was common practice.⁷⁶ That some maps, especially the modern ones, differ in appearance in both manuscripts of Berlinghieri's *Geographia* may thus be because Federico d'Urbino and Lorenzo de Medici each had to get a unique copy of the same atlas. They could not be provided with a duplicate.

Joint production of manuscripts and printed edition

In the previous chapters we have shown that the printed edition of the *Geography* must have been completed around the end of August or the beginning of September 1482. The printing started after the completion of Ficino's edition of Dante's *La Divina Commedia* late in August 1481. In total 245 pages were printed at the rate of one page per day. About 130 pages have been printed before the break halfway Liber Secundus and about 115 after the break. During the break approximately thirty sets of the first type of maps were printed, at an already substantiated pace of one complete set of maps a day. It is also known that people worked six days a week in those days. Let us assume an average of 24 days per month, considering lost workdays, holidays, repairs, urgent work in between, and the like. If we now calculate backwards from September 1, 1482, then the first maps must have been printed around the beginning of March 1482. This is based on the printing of 115 pages of text and 30 sets of maps in 145 working days which results in six months based on 24 working days per month. In case the engraving of the copper plates took about a year, then it must have started in March 1481. That would correspond perfectly with Berlinghieri's return to Florence after his ambassadorship in Mantua in 1479 and 1480. About 130 text pages were printed before the first maps, thus before March 1482. Assuming 24 working days per month that would amount to about five and a half months. Counting backwards, this would mean that the printing of the text must have started amid September 1481. That fits in very well with the completion of the printing of Dante's *La Divina Commedia*.

For the manuscripts, a production period of one to one and a half years should be considered. It is described that the colouring of the maps of the printed copy intended for Christoforo di Giustinopoli took about a year.⁷⁷ Both manuscripts of Berlinghieri's *Geographia* are more preciously executed and therefore must have been more labour-intensive. This applies specifically to the maps. When the engraving of the copper plates for the maps of the printed edition started in March 1481, this means that the working template must have been available at the same time for the painted maps for both manuscripts of the *Geographia*. A production time of one and a half years for these painted maps seems realistic. The transcription and illumination of the text of the *Geographia* by a copyist must have been possible in one year given the pace of copyists described by King.⁷⁸ In that case, the copyist could also have started transcribing around the end of August 1481 at the same time as Tedescho started printing. Only one working manuscript was available which had to be copied twice for both manuscripts. The same manuscript was also used to typeset the text of the *Geography*. Therefore, a few months earlier start for the copyists to stay ahead of the pace of printing would also be very well possible. The manuscripts had to be ready ahead of the printed edition. It is unthinkable that printed copies would have been available before Federico d'Urbino and Lorenzo de Medici could receive their presentation copies. This meant that the copyists might have needed the working manuscript a little earlier than Tedescho. Either way, the copyists and Tedescho all must have been working on the same project simultaneously. This is in line with our findings that Tedescho started printing with Liber Quartus. The first three libers must initially

⁷⁵ Consiglio regionale del Piemonte, op. cit. (n. 33), p. 28.

⁷⁶ Dalché, op. cit. (n. 54), pp. 321-22.

⁷⁷ Op. cit. (n. 10), pp. 69-73.

⁷⁸ Op. cit. (n. 1), pp. 124-38, 236.

have been with the copyists. They were later exchanged with the last four libers after Tedescho had printed them. Finally, Tedescho got the last four libers back one more time because he had yet to print the gazetteers of Liber Quartus, Quintus, and Sextus, the frontispiece, the preliminary leaves, and the register. Regardless of our reasoning earlier in this book, given the production time required for both the printed edition and both manuscripts, all three must have been in progress at the same time given the fact that the project started after Berlinghieri's return from Mantua. Our findings confirm that all three were completed before Urbino's death in September 1482.

We would like to emphasize one more issue related to the chronology. In chapter six on the maps, we described the different states of each map and explained the evolution of the states (table four and six). Apart from two state changes due to artefacts, all other state changes occurred during the printing of the first type of maps during the break described and dated above. The adaptations of the copper plates involved the correction of errors such as the titles above several maps. Other adaptations can be traced back to one or the other of Berlinghieri's manuscripts and, in a few cases, to an unidentified specimen (Fig. 596-98). A very specific adjustment concerns the change of the title of the map *TABVLA QVINTA D EVROPA* in *TABVLA QVINTA D ERVPA* and back again to *TABVLA QVINTA D EVROPA* (Fig. 593-95). We have not found ERVPA in any manuscript, copy or edition except the Braidense manuscript by Berlinghieri. In our opinion, the above strongly suggests that the maps of both manuscripts must also have been ready around March 1482 and that the sets of maps of both manuscripts must have been compared with the first printed maps after which the copper plates underwent some adjustments. From a chronological point of view this may very well be correct. It implies that around March 1481 the tracing of the working template and subsequently the painting of the maps for both manuscripts must have started. That corresponds with the start of copying the working template on the copper plates followed by the engraving. It proves again that both manuscripts and the printed edition were in development and production at the same time.

From all that we have shown, it can be deduced that Berlinghieri was clearly not an innovative cartographer. He used existing examples for the maps and probably had them adapted by a local studio for a new graphic appearance. It must have been a tremendous undertaking at the time to produce his *Geographia* and *Geography* and to have the extremely large copper plates engraved and printed. We have succeeded in uncovering the *modus operandi* but that also implies why we will probably never succeed in ascertaining which examples the maps are derived from. Given the working procedure, it rather seems that multiple references were used and that the printed maps of the *Geography* were even adjusted after comparison with Berlinghieri's manuscripts of the *Geographia*.

EPILOGUE

That brings us to the end of our book. We have established beyond doubt that Berlinghieri's *Geography* was printed in 1482. In the same period as the printed edition, two manuscripts were also made, one for Federico d'Urbino to whom the printed book is dedicated and one for Lorenzo de Medici with whom Berlinghieri maintained close ties. The text pages were printed in an edition of about 500. Initially, over 30 sets of maps were printed. At the end of 1482 and the beginning of 1483, approximately a double number of sets of maps was added. Around 1520, the Giunti printing office printed the last 400 sets of maps and provided the title page on the front with a new title in red ink. The watermarks made it possible to establish a very clear and identical structure for the text pages of all the atlases. For each printing phase of the maps different paper was used, which could be determined conclusively based on the watermarks in combination with the state of the map and the colouring. This use of paper was typical of the Florentine printing offices at that time. We were able to establish this by including several other books in our research, mainly printed by Tedesco and three other printers. The first thirty sets of maps are usually impressive and expensively coloured, and these atlases regularly bear the owner's coat of arms. This contrasts with the second set of maps, which are coloured more basic and also less often personalised. Uncoloured maps of both types also occur. The maps printed by Giunti are for the most part uncoloured. During the first printing phase of the maps, the copper plates were regularly adjusted. On two maps later changes can be observed, but these were externally caused and independent from the book. Different fonts were used for the printing of the text, which are, however, very similar. By today's standards this seems incomprehensible, but given the level at which the printing technique was in financial and technical terms at the time it is completely plausible. Moreover, at the time it was quite common for manuscripts to be transcribed by several people with different handwriting. The different but almost identical fonts will probably not have been a problem at that time. We have not been able to identify the engravers of the copper plates. However, several engravers worked on the maps, most of whom, judging by the result, were moderately skilled. It is possible that their names will turn up in some source or document, but we consider the chance of that happening to be very small. The maps in both manuscripts and the printed version are basically and for the most part traced from the same working template. For some maps, especially in Urbino's manuscript, another working template was used. The further completion and detailing of the maps appear to be based on multiple sources. The search for a master copy is, in our opinion, a dead end. It cannot be found, given the method of working that we discovered and described. Many scholars wrote that the *Geography* was printed sloppily and with many errors, possibly due to haste. We have shown that there was no rush, but that it was printed at a quality that was common at the time in Florence, when printing was still developing and improving every year. We would therefore like to emphasise that the production of the *Geography* is evidence of both Berlinghieri's and Tedesco's great entrepreneurship and willingness to take on challenges. This applies specifically to the maps and the engraving and printing of the copper plates used for them, which were of an enormous size for that time. We are convinced that new watermarks may turn up in the copies not studied by us. Our research will prove to be useful in the further interpretation. The first maps were printed in a very limited edition and mostly bound into atlases intended for high-ranking persons and distinguished libraries of the time. These atlases are therefore well preserved. Loose copies of maps from this phase are very rare. This also applies to a large degree to the sets of maps that were printed second. The vast majority of the separate maps that are found nowadays come from Giunti's edition from around 1520.

The complete research and writing process took us four and a half years. This was partly because we were both professionally occupied full time. The trips to the cities and libraries with atlases had to be planned in the holidays, so the research was done in phases. In retrospect, this turns out to have been an advantage. The production of Berlinghieri's *Geography* was much less straightforward than that of the various Rome editions of the *Cosmography*. Moreover, the composition of quite some atlases was diverse. These circumstances provided us with ample time to study and analyse the material properly

based on the countless photos. This was often accompanied by short, restless, and sleepless nights until the problems were solved or the next question could be defined. In this way, theories were formed that could be tested and adjusted during the next visit. Gradually, we got to know and understand the *Geography*. In this way, we also gained understanding for other researchers. Often, they have studied a relatively limited number of copies in the vicinity, which, due to the great diversity found in the atlases studied, can give a limited and distorted picture. We have only been able to interpret the *Geography* by studying a fairly large number of atlases from each printing phase and by comparing the watermarks, the printing characteristics, and the maps in much more detail. The phased progression made it possible to process the labour-intensive research and the large quantity of collected data in a controlled manner, so that we could climb a little hill at a time and thus come closer to the top, rather than having to conquer the mountain in one go. While writing, I was confronted with the fact that it was still quite a job to put down on paper in an understandable and orderly way what was clearly and distinctly present in my brain in a language that was not my mother tongue. Frans, my co-author, played an important role in this. First, he provided me with the necessary knowledge and information with which I could indulge in the collected data. He sometimes restrained or adjusted me based on his encyclopedic knowledge but also personal experience in the field of watermarks, paper, and printing. He also played an important role in the writing and editing by ensuring that what was or seemed to be self-evident for me, was also put down on paper in a clear and orderly manner for less well-informed people, who had not seen and studied everything for themselves. We spent many evenings going through the material, sometimes intensely discussing it while enjoying a nice glass of wine. It sometimes took a while or until the next visit to a city before we could conclude. In retrospect, we can say that these conversations were very useful and led to the deepening of our understanding of how the *Geography* came to be. We also tried to understand art, life, and society in a broader sense. But we didn't quite get there.

That brings me to the next subject: the visits and trips to the towns and institutes in Italy, England, Belgium, and the Netherlands where Berlinghieri's *Geography* and the other books printed by Tedescho could be studied. At first, I went there together with my wife Marjolein, sometimes alone, and later mostly together with Frans. It took us to cities such as Florence, Rome, Vatican City, Milan, Turin, Siena, Lucca, London, Brussels, and Amsterdam. We had seen many of these cities before, but now we visited them in a different way, less as tourists but more for work and research, so we got to know them differently and with a new experience. Some cities we visited several times because the material to be studied could not be processed in one visit or because things had to be re-examined. This was certainly not a punishment. We went to places and saw and experienced things that tourists do not have access to or do not get to. So, it was certainly not just research at the expense of a holiday, but also a different way of holidaying and enjoying ourselves. I would like to share a few experiences with you. With my wife, we visited the British Museum just after New Year's Day. We were admitted studying the atlas in what we remember as a colossal room where the pieces in the collection were being inventoried at the time directly behind the hall where prints were exhibited. That was wonderful to see happen. The visit to the National Maritime Museum in Greenwich became a very special experience. Apart from the outing and the pleasant visit, we later discovered that the copy there contained a few maps in proof. It is exceptional and rare that proofs of prints or maps from the fifteenth century have been preserved. In Vatican City, we were allowed to study the atlases in the *Sala Sistina*, a very large room decorated from top to bottom with frescos and gold leaf. We were the only ones present in the room apart from a member of the library staff. Every now and then a cardinal entered the room from a side door with a visitor who was obviously just as impressed as we were by these surroundings. With Frans I visited the Corsiniana library in the Lincei institute, the oldest scientific society in Europe. The room in which we studied the books was impressive and the names of famous scientists from earlier centuries were displayed on the ceiling and high up on the walls. Newton and Galileo, among others, were members of this society, and Galileo even found shelter and protection there in the days when his books were condemned. This environment humbled us. In the beautiful Riccardiana library I held a book which, as far as we know, seems to be the only extant copy in the world. That knowledge did not leave me unmoved either. I do not want to underestimate the other locations and visits. They all remain in my memory for one reason or another, but it would be going too far to describe them all here. What also impressed me, apart from the cities and the special institutes and their beauty, were the atlases and other books we studied. Many of them have

been in the possession of famous people from our history and they are 500 to 600 years old. In that time, they must have been looked at by many more important people and scientists. And now we were given the chance to hold them and study them. We felt privileged by this experience.

This brings me to the next point that I would like to mention in this epilogue and for which I would like to thank everyone extensively. It is not like you can just walk right in and pick up an atlas from a bookshelf. That is not how it works, but the service, willingness and help we have received to enable the visits to all the institutes and libraries has been unprecedented in our eyes. Even afterwards, when photos of certain watermarks or maps were requested by us, they were promptly provided. In Italy everything ran very smoothly and with great service. But that may also be because it seemed to be less accessible due to a lesser command of Italian compared to English, the beautiful climate compared to that in Northern Europe and the more exotic surroundings. The most difficult to approach was the copy in our own country, in Amsterdam. But that was due to the fact that it had just gone on display in the Scheepvaartmuseum and was in a special air-conditioned cabinet that could not be opened just like that. The duration of the exhibition was I think two to three years. Eventually, we were also allowed and able to study this atlas in our own country. We did not personally study a few of the copies. These include two atlases in Chicago and one in Naples. We obtained important information and photos of these copies by e-mail. I would also like to thank the staff of these institutes. I now recall that we studied a second copy in our own country that we researched in special surroundings. It concerns the specimen that was then in the possession of Daniel Crouch rare books. We were able to study and photograph it in his stand at the Tefaf in Maastricht, which was also a privileged experience. Unfortunately, this event has since been cancelled because of COVID-19 for a few years now, which brings me to the next subject I would like to mention.

The virus has been sweeping the world for more than two years. We hope that it will stop soon, for obvious reasons, but regarding our project we are a little ambivalent in relation to COVID-19. On the one hand, it has caused a delay. We had initially thought and calculated that it would take us about four years to carry out the research and describe the findings. In the end, it took five years. This is due to COVID-19 as we had to cancel and postpone a trip several times when the virus peaked. The delay cannot be blamed on COVID-19 alone. At some point, we decided to include many copies of other books printed by Tedesco in the research. On the other hand, writing and finding time for it was less stressful because of COVID-19. After all, you could not do much else during longer periods and during lockdowns. In this sense, the pandemic has been helpful. It may also explain our enthusiasm for the service and help we experienced in Italy, because we visited several institutes there during the pandemic as well. This did involve some more consultation and coordination on behalf of COVID, but the cooperation and extra effort of those involved was enormous. Finally, it is a catchphrase but no less true, I would like to thank my wife Marjolein and my children Daan and especially Lotte for all their help and understanding and finally my co-author Frans. It was a real pleasure to have spent so much time with you and to have become acquainted with the art world and your extensive knowledge of it. I have experienced the whole process as an enormous enrichment of my life. Organising the whole project, solving the puzzle, experiencing how difficult it is to describe and appearing to succeed in doing so has given me intellectual satisfaction and possibly helped to keep Alzheimer's at bay for a little longer. I experienced the trips, the visits to the institutes, the meeting of many new people, the help of my family and getting to know and deal with Frans as very inspiring. It was well worth the many hours. And now I will stop.

“If a man will begin with certainties, he shall end in doubts, but if he will be content to begin with doubts, he shall end in certainties.”¹

EINIS

The solution can be found in this book

¹ The Elizabethan philosopher Francis Bacon.

TABLES

Legend tables one to six

Table 1: Inconsistencies in the text

From left to right:

Blue is applied for first edition atlases with maps of the first print run, green for first edition atlases with maps of the second print run, and different shades of grey for second edition atlases SEFR, SESR, SETR.

From top to bottom:

Black in the first column is applied for regular text pages and red for the gazetteers.

The data displayed inside the table:

This colour is applied for inconsistencies concerning the page numbers, this colour is applied for missing guide letters, this colour is applied for text inconsistencies, this colour is applied for inconsistencies concerning the headers.

Additional remarks:

The text pages of the atlases with shelfmarks Milan AK.XVI.12, Turin XV.I.41, Milan AM.XV.36, and Milan Inc.422 are only partially studied.

Table 2a and b: The text pages

From left to right:

Blue is applied for first edition atlases with maps of the first print run, green for first edition atlases with maps of the second print run, and different shades of grey for second edition atlases SEFR, SESR, SETR.

From top to bottom:

Black in the first column is applied for regular text pages font 115 Ra, red for the gazetteers font 115 Rb, light blue for the preliminary leaves font 111 Ra, brown for the interleaves, and purple for the page with the register and colophon.

The data displayed inside the table:

1,2,3,4, and 6 = the watermark cardinal's hat type one to four and six.

O = watermark ox; SS = watermark shearer scissors; CE = watermark crowned eagle.

This colour is applied to indicate where paper with deviating watermarks, probably spare leaves were used.

The other colours inside the table correspond with those applied for the data from top to bottom.

Additional remarks:

Page 81, the first page of the gazetteer of LIBER QVARTVS, is mentioned twice in the fourth column, the rightmost one of table 2b, because this is the only page in the *Geography* that is printed twice, the first time with the regular text, the second time with the text of the gazetteer.

Table three: The interleaves

From left to right:

Brown is applied for the interleaves placed by Tedscho, orange for those placed by the workshop that coloured the maps.

From top to bottom:

Blue is applied for first edition atlases with maps of the first print run, green for first edition atlases with maps of the second print run, and different shades of grey for second edition atlases SEFR, SESR, SETR.

Additional remarks:

The abbreviations used for the different watermarks can be found in attachment one.

Interleaf 126 was the hardest to find, this sheet was regularly reinserted at a different location.

Only atlases with at least one interleaf present are included in this table.

Table four: The maps

From left to right:

Blue is applied for first edition atlases with maps of the first print run, green for first edition atlases with maps of the second print run, and different shades of grey for second edition atlases SEFR, SESR, SETR.

The data displayed inside the table:

This colour is used for watermarks in the backing, this colour is used for watermarks in first edition first print run maps, this colour is used for watermarks in first edition second print run maps, and different shades of grey are applied for second edition maps of the first, second, and third print run.

Black is used for maps in the first state, red for maps in the second state, and green for maps in the third state.

Additional remarks:

The abbreviations used for the different watermarks can be found in attachment one.

Missing means that the map was not present.

The ? means state not determinable or unable to check.

X means not applied.

The watermarks P, MCC, CRE, CREC, CRERC, CROWC, LA, LACS, S, SS, SI and T are not further specified because they were difficult to distinguish or because that was not considered relevant.

Where the specification of the watermarks is missing it was not possible to determine the type reliably or no images were available to check the watermark.

NOW means no watermark present with certainty.

Table five: The backings

From left to right:

Blue is applied for first edition atlases with maps of the first print run FEFR, green for first edition atlases with maps of the second print run FESR.

The data displayed inside the table:

- means watermark present in maps of the first edition first print run found in these atlases.
- means watermark present in maps of the first edition second print run found in these atlases.
- means watermark present in backing of the maps found in these atlases.

Table six: The chronology of the states

From left to right:

Blue is applied for first edition atlases with maps of the first print run FEFR, green for first edition atlases with maps of the second print run FESR, and black for the second edition atlases.

The data displayed inside the table:

Black is used for maps in the first state, red for maps in the second state, green for maps in the third state, AND P FOR PROOF PRINTS.

This colour is applied for watermarks in maps of the first edition first print run, this colour is applied for watermarks in maps of the first edition second print run.

TABLE ONE

	Turin XV.I.42 FEFR	Rome Inc.541 FEFR	Rome 70.1.G.5 FEFR
6 r	.aa iii. instead of .aa iiiii.	.aa iii. instead of .aa iiiii.	.aa iii. instead of .aa iiiii.
7 r	.aa iiiii. instead of .aa iiiii.	.aa iiiii. instead of .aa iiiii.	i.aa iiiii. instead of .aa iiiii.
14 r	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS
15 r	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS
16 r	.bb iiiii. missing	.bb iiiii. missing	.bb iiiii. missing
20 v		?	
23 r	LIBER SECUNDUS missing	LIBER SECUNDUS missing	LIBER SECUNDUS missing
24 v			
32 r			
59 v	TERTIUS LIBER instead of LIBER TERTIUS	TERTIUS LIBER instead of LIBER TERTIUS	TERTIUS LIBER instead of LIBER TERTIUS
60 r	LIBER TERTI US interspaced	LIBER TERTI US interspaced	LIBER TERTI US interspaced
61 r	.hh.iii. missing	.hh.iii. missing	.hh.iii. missing
63 v	LIBER TERTIUS missing	LIBER TERTIUS missing	LIBER TERTIUS missing
64 r+v	LIBER SECUNDUS instead of TERTIUS	LIBER SECUNDUS instead of TERTIUS	LIBER SECUNDUS instead of TERTIUS
65 r			
72 r			
78 r	.b iiiii. missing		
81 r			
81 v	LIBER SEXTUS instead of QUARTUS	LIBER SEXTUS instead of QUARTUS	LIBER SEXTUS instead of QUARTUS
82 v			
84 r	n of nElquinto missing		n of nElquinto missing
86 r		.c.ii. missing	
94 r			
101 v	QUIN TUS interspaced	QUIN TUS interspaced	QUIN TUS interspaced
103 v	LIBER QUINTUS missing	LIBER QUINTUS missing	LIBER QUINTUS missing
104 r	LIBER QUINTUS missing	LIBER QUINTUS missing	LIBER QUINTUS missing
105 r			
113 r			
115 r			
117 r	.f.i. missing	.f.i. missing	
124 r			

TABLE ONE

	Florence Inc.34 FEFR	Amsterdam Me 0376 FEFR	Florence Magl. Inc. N_20 FEFR
6 r	.aa iii. instead of .aa iii.	.aa iii. instead of .aa iii.	.aa iii. instead of .aa iii.
7 r	.aa iii. instead of .aa iii.	.aa iii. instead of .aa iii.	?
14 r	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS
15 r	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS
16 r	.bb iii. missing	.bb iii. missing	.bb iii. missing
20 v			
23 r	LIBER SECUNDUS missing	LIBER SECUNDUS missing	LIBER SECUNDUS missing
24 v			
32 r			Thyle missing
59 v	TERTIUS LIBER instead of LIBER TERTIUS	TERTIUS LIBER instead of LIBER TERTIUS	TERTIUS LIBER instead of LIBER TERTIUS
60 r			LIBER TERTI US interspaced?
61 r			
63 v	LIBER TERTIUS missing	LIBER TERTIUS missing	LIBER TERTIUS missing
64 r+v	LIBER SECUNDUS instead of TERTIUS	LIBER SECUNDUS instead of TERTIUS	LIBER SECUNDUS instead of TERTIUS
65 r			
72 r			
78 r			
81 r			
81 v	LIBER SEXTUS instead of QUARTUS	LIBER SEXTUS instead of QUARTUS	LIBER SEXTUS instead of QUARTUS
82 v	LIBER SEXTUS instead of QUARTUS		LIBER SEXTUS instead of QUARTUS
84 r	?		
86 r		.c.ii. missing	
94 r		.d. i. missing i	
101 v		QUIN TUS interspaced?	QUIN TUS interspaced
103 v	LIBER QUINTUS missing	LIBER QUINTUS missing	LIBER QUINTUS missing
104 r	LIBER QUINTUS missing	LIBER QUINTUS missing	LIBER QUINTUS missing
105 r			
113 r			
115 r			DE DSID instead of DE ASIA
117 r			.f.i. missing
124 r			

TABLE ONE

	Barcelona Inc. 47-Fol FEFR?	Florence SEDE.Ed.R.624 FESR	Venice Inc.0037 FESR
6 r	.aa iii. instead of .aa iiiii.	.aa iii. instead of .aa iiiii.	.aa iii. instead of .aa iiiii.
7 r	.aa iiiii. instead of .aa iiiii.	?	.aa iiiii. instead of .aa iiiii.
14 r	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS
15 r	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS
16 r	.bb iiiii. missing	.bb iiiii. missing	
20 v			
23 r	LIBER SECUNDUS missing	LIBER SECUNDUS missing	LIBER SECUNDUS missing
24 v			
32 r			
59 v	TERTIUS LIBER instead of LIBER TERTIUS	TERTIUS LIBER instead of LIBER TERTIUS	TERTIUS LIBER instead of LIBER TERTIUS
60 r		LIBER TERTI US interspaced	LIBER TERTI US interspaced
61 r		.hh.iii. missing	
63 v	LIBER TERTIUS missing	LIBER TERTIUS missing	LIBER TERTIUS missing
64 r+v	leaf is missing	LIBER SECUNDUS instead of TERTIUS	LIBER SECUNDUS instead of TERTIUS
65 r			
72 r			
78 r			
81 r		LIBER SEXTUS instead of QUARTUS	LIBER SEXTUS instead of QUARTUS
81 v	LIBER SEXTUS instead of QUARTUS	LIBER SEXTUS instead of QUARTUS	LIBER SEXTUS instead of QUARTUS
82 v	LIBER SEXTUS instead of QUARTUS	LIBER SEXTUS instead of QUARTUS	LIBER SEXTUS instead of QUARTUS
84 r	?		
86 r	.c.ii. missing		.c.ii. Missing
94 r		.d. i. missing i	.d. i. missing i
101 v	QUIN TUS interspaced		QUIN TUS interspaced
103 v	LIBER QUINTUS missing	LIBER QUINTUS missing	LIBER QUINTUS missing
104 r	LIBER QUINTUS missing	LIBER QUINTUS missing	LIBER QUINTUS missing
105 r			
113 r			
115 r	DE DSID instead of DE ASIA		DE DSID instead of DE ASIA
117 r	.f.i. missing	.f.i. missing	
124 r			

TABLE ONE

	Venice Inc.D.013 FESR	Milan AK.XVI.12 SEFR	London 163.b.1 SESR
6 r	.aa iii. instead of .aa iii.		.aa iii. instead of .aa iii.
7 r	.aa iii. instead of .aa iii.		.aa iii. instead of .aa iii.
14 r	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS
15 r	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS
16 r	.bb iii. Missing		
20 v			T of Taraconense missing
23 r	LIBER SECUNDUS missing	LIBER SECUNDUS missing	LIBER SECUNDUS missing
24 v	S of Seggio missing		S of Seggio missing
32 r			
59 v	TERTIUS LIBER instead of LIBER TERTIUS	TERTIUS LIBER instead of LIBER TERTIUS	TERTIUS LIBER instead of LIBER TERTIUS
60 r			
61 r	.hh.iii. Missing		.hh.iii. missing
63 v	LIBER TERTIUS missing	LIBER TERTIUS missing	LIBER TERTIUS missing
64 r+v	LIBER SECUNDUS instead of TERTIUS	LIBER SECUNDUS instead of TERTIUS	LIBER SECUNDUS instead of TERTIUS
65 r			
72 r			c of Cyrenaica missing
78 r			
81 r		LIBER SEXTUS instead of QUARTUS	
81 v	LIBER SEXTUS instead of QUARTUS	LIBER SEXTUS instead of QUARTUS	LIBER SEXTUS instead of QUARTUS
82 v		LIBER SEXTUS instead of QUARTUS	LIBER SEXTUS instead of QUARTUS
84 r			
86 r	.c.ii. Missing		.c.ii. missing
94 r			
101 v		QUIN TUS interspaced	
103 v	LIBER QUINTUS missing	LIBER QUINTUS missing	LIBER QUINTUS missing
104 r	LIBER QUINTUS missing	LIBER QUINTUS missing	LIBER QUINTUS missing
105 r			.e.i missing
113 r		LIBER EXTUS instead of SEXTUS	
115 r		DE DSID instead of DE ASIA	
117 r	.f.i. missing		.f.i. missing
124 r			

TABLE ONE

	Brussels Inc C 208 SETR	Turin XV.I.41 SETR	Milan AM.XV.36 SETR
6 r	.aa iiii.		
7 r	.aa iiii.		
14 r	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS
15 r	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS
16 r	.bb iiii. Missing		
20 v			
23 r	LIBER SECUNDUS missing	LIBER SECUNDUS missing	LIBER SECUNDUS missing
24 v	S of Seggio missing		
32 r	Thyle missing		Thyle missing
59 v	TERTIUS LIBER instead of LIBER TERTIUS	TERTIUS LIBER instead of LIBER TERTIUS	TERTIUS LIBER instead of LIBER TERTIUS
60 r	LIBER TERTI US interspaced		
61 r			
63 v	LIBER TERTIUS missing	LIBER TERTIUS missing	LIBER TERTIUS missing
64 r+v	LIBER SECUNDUS instead of TERTIUS	LIBER SECUNDUS instead of TERTIUS	LIBER SECUNDUS instead of TERTIUS
65 r		LIBER SECUNDUS instead of TERTIUS	LIBER SECUNDUS instead of TERTIUS
72 r			
78 r			
81 r			
81 v	LIBER SEXTUS instead of QUARTUS	LIBER SEXTUS instead of QUARTUS	LIBER SEXTUS instead of QUARTUS
82 v		LIBER SEXTUS instead of QUARTUS	
84 r	n of nElquinto missing		
86 r			
94 r			
101 v			
103 v	LIBER QUINTUS missing	LIBER QUINTUS missing	LIBER QUINTUS missing
104 r	LIBER QUINTUS missing	LIBER QUINTUS missing	LIBER QUINTUS missing
105 r			
113 r			
115 r	DE DSID instead of DE ASIA		
117 r			
124 r	LIBER TERTIUS instead of SEPTIMUS		

TABLE ONE

Milan Inc.422 SETR		Florence Palat D.7.1.5 SETR	Paris C 2035 9 SE??
6 r		.aa iii. instead of .aa iii.	.aa iii. instead of .aa iii.
7 r		?	.aa iii. instead of .aa iii.
14 r	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS
15 r	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS	PRIMUS LIBER instead of LIBER PRIMUS
16 r			
20 v			
23 r		LIBER SECUNDUS missing	LIBER SECUNDUS missing
24 v			
32 r			Thyle missing
59 v		TERTIUS LIBER instead of LIBER TERTIUS	TERTIUS LIBER instead of LIBER TERTIUS
60 r		LIBER TERTI US interspaced?	LIBER TERTI US interspaced
61 r		.hh.iii. missing	.hh.iii. missing
63 v		LIBER TERTIUS missing	LIBER TERTIUS missing
64 r+v		LIBER SECUNDUS instead of TERTIUS	LIBER SECUNDUS instead of TERTIUS
65 r		LIBER SECUNDUS instead of TERTIUS	
72 r			
78 r			
81 r	LIBER SEXTUS instead of QUARTUS		
81 v	LIBER SEXTUS instead of QUARTUS	LIBER SEXTUS instead of QUARTUS	LIBER SEXTUS instead of QUARTUS
82 v	LIBER SEXTUS instead of QUARTUS		LIBER SEXTUS instead of QUARTUS
84 r			
86 r		.c.ii. missing	
94 r			
101 v			
103 v		LIBER QUINTUS missing	LIBER QUINTUS missing
104 r		LIBER QUINTUS missing	LIBER QUINTUS missing
105 r			
113 r			
115 r			DE DSID instead of DE ASIA
117 r		.f.i. missing	.f.i. missing
124 r			

TABLE ONE

Historic Map Works OL5386 SE??

6 r	.aa iii. instead of .aa iiiii.
7 r	.aa iiiii. instead of .aa iiiii.
14 r	PRIMUS LIBER instead of LIBER PRIMUS
15 r	PRIMUS LIBER instead of LIBER PRIMUS
16 r	
20 v	
23 r	LIBER SECUNDUS missing
24 v	
32 r	
59 v	TERTIUS LIBER instead of LIBER TERTIUS
60 r	
61 r	.hh.iii. missing
63 v	LIBER TERTIUS missing
64 r+v	LIBER SECUNDUS instead of TERTIUS
65 r	
72 r	
78 r	
81 r	
81 v	LIBER SEXTUS instead of QUARTUS
82 v	LIBER SEXTUS instead of QUARTUS
84 r	n of nElquinto missing
86 r	
94 r	
101 v	
103 v	LIBER QUINTUS missing
104 r	LIBER QUINTUS missing
105 r	
113 r	LIBER SEPTIMUS
115 r	DE DSID instead of DE ASIA
117 r	
124 r	

TABLE TWO a

	Florence Inc.I.5 FEFR	Turin XV.I.42 FEFR	Rome Inc.541 FEFR	Rome 70.1.G.5 FEFR	Amsterdam Me 0376 FEFR	Florence Magl. Inc. N_20 FEFR
1 frontispiece	missing	-	-	missing		-
2 in quale libro	-	missing	1	4	4	1
3 liber primus	4	-	-	-	4	-
4	-	4	2	-	4	-
5	2	2	-	-	2	2
6	-	-	4	4	4	4
7	4	-	-	4	-	-
8	-	4	4	-	4	4
9	4	3	-	-	-	-
10	-	-	3	3	-	-
11	4	-	-	3	-	4
12	-	4	4	4	-	4
13	-	2	2	-	-	2
14	-	-	2	2	2	-
15 liber secundus	2	-	-	-	-	3
16	2	-	2	-	2	3
17	-	3	-	3	-	-
18	-	2	4	3	2	-
19	3	3	-	-	-	3
20	3	-	-	3	2	-
21	-	-	-	4	4	4
22	4	-	-	-	4	-
23	4	4	-	-	1	-
24	-	-	1	-	-	-
25	1	1	-	1	1	1
26	-	-	4	1	-	4
27	-	3	2	3	-	4
28	4	4	4	-	-	-
29	-	1	1	1	-	1
30	1	-	1	1	-	-
31	1	1	-	1	-	-
32 gaz lib sec	1	-	1	1	-	1

TABLE TWO a

	London PBD 7690 FEFR	Siena O.II.35 FE?	Florence R.A.788 FESR?	Vatican City Stamp.Ferr. S.37 FESR	Rome Vol.Inc.1110 FESR	Florence SEDE.Ed. R.624 FESR
1 frontispiece	missing	-	4	4	-	1
2 in quale libro	-	missing	-	-	4	-
3 liber primus	4	-	-	4	-	4
4	-	2	-	4	-	4
5	-	-	2	-	-	-
6	-	-	-	4	-	4
7	-	-	4	4	4	4
8	4	4	-	-	-	-
9	4	3	4	-	4	-
10	3	3	-	3	3	3
11	2	-	4	-	4	-
12	1	4	4	-	4	-
13	-	-	2	-	2	2
14	-		-	2	-	2
15 liber secundus	-	3	3	-	3	-
16	4	2	-	-	2	2
17	-	-	3	2	-	-
18	3	-	-	3	-	3
19	3	-	3	-	3	-
20	3	3	-	2	-	-
21	-	-	-	-	-	4
22	2	4	2	-	-	-
23	-	4	-	4	1	4
24	-	1	-	-	-	-
25	1	-	1	1	1	1
26	4	-	-	-	-	-
27	-	-	-	3	4	2
28	4	4	4	4	4	-
29	1	-	1	1	-	-
30	1	-	-	1	1	1
31	-	1	-	1	1	1
32 gaz lib sec	1	-	4	-	-	-

TABLE TWO a

	Lucca Inc.214 FESR	Venice Inc.0037 FESR	Venice Inc.D.013 FESR	Florence D.III.56 FESR	Vatican City Inc.S.120 FESR	London C.1.d.1 FESR
1 frontispiece	missing	missing	missing	-	4	-
2 in quale libro	1	4	missing	4	-	missing
3 liber primus	1	-	4	-	-	-
4	-	4	-	-	-	-
5	-	-	2	-	2	2
6	-	4	4	-	4	2
7	4	-	-	4	-	-
8	-	4	4	-	4	4
9	4	-	-	4	-	-
10	3	3	-	3	-	-
11	4	-	4	3	4	4
12	4	4	-	4	3	-
13	2	-	2	-	-	-
14	-	-	2	3	-	2
15 liber secundus	-	2	2	2	-	-
16	-	4	-	-	2	-
17	4	-	3	3	-	3
18	3	-	-	-	3	3
19	2	3	-	-	-	-
20	-	2	-	2	3	3
21	4	4	-	4	4	-
22	-	2	2	4	-	-
23	1	4	-	-	-	4
24	1	-	1	-	-	-
25	-	1	-	1	1	1
26	-	-	4	4	4	-
27	4	-	-	-	3	2
28	-	-	4	-	-	4
29	-	1	-	-	1	-
30	-	-	1	1	-	1
31	1	-	1	1	-	-
32 gaz lib sec	-	1	-	1	-	1

TABLE TWO a

	Milan AK.XVI.12 SEFR	Rome 70.1.G.7 SEFR	Rome 70.1.G.10 SEFR	Vatican City Stamp.Ross. 301 SESR	Rome 51.G.1 SESR	London C.3.d.10 SESR
1 frontispiece	4	4	-	-	-	-
2 in quale libro	-	-	4	4	4	missing
3 liber primus	4	-	4	-	-	4
4	3	4	-	-	-	-
5	-	-	2	-	2	-
6	1	4	4	4	4	4
7	4	-	4	-	-	-
8	-	4	-	4	4	4
9	-	-	-	-	-	-
10	3	3	-	3	-	3
11	-	-	3	4	3	4
12	-	4	-	4	4	-
13	-	2	2	2	3	-
14	2	2	-	-	3	2
15 liber secundus	-	-	-	-	2	4
16	-	-	-	2	3	-
17	3	4	2	-	-	4
18	3	3	3	3	-	-
19	-	-	3	3	-	-
20	2	missing?	-	-	-	3
21	4	missing?	-	4	4	4
22	-	3	-	2	-	-
23	4	4	4	1	-	-
24	1	1	-	1	-	-
25	-	-	1	-	1	1
26	-	-	-	-	4	4
27	4	-	3	-	4	4
28	-	-	4	-	-	-
29	-	-	-	1	1	-
30	1	-	1	1	-	1
31	-	-	1	1	1	1
32 gaz lib sec	-	-	-	-	SS	1

TABLE TWO a

	Milan Inc.422bis SESR	London 163.b.1 SESR	Brussels Inc C 208 SETR	London G.8173 SETR	London Crouch 12890 SETR	Turin XV.I.41 SETR
1 frontispiece	-	4	-	-	-	4
2 in quale libro	-	-	4	4	4	-
3 liber primus	4	-	-	-	-	-
4	4	-	2	4	3	4
5	2	-	2	-	-	-
6	-	4	-	-	2	4
7	-	-	4	3	4	-
8	4	4	-	-	-	4
9	4	-	4	4	-	-
10	-	3	-	3	3	3
11	-	3	-	-	-	-
12	-	4	4	4	4	4
13	-	-	3	2	-	2
14	-	2	-	3	-	2
15 liber secundus	2	-	3	-	2	3
16	3	3	2	4	-	-
17	-	-	-	-	3	3
18	-	4	-	3	-	-
19	3	-	3	-	3	-
20	3	3	-	-	3	-
21	-	-	-	-	4	4
22	-	-	-	-	-	2
23	-	4	-	-	1	4
24	-	-	1	-	-	1
25	1	1	-	1	1	-
26	4	-	1	4	-	-
27	4	3	4	3	4	-
28	4	4	4	4	-	-
29	1	1	1	1	1	-
30	1	1	1	1	-	-
31	-	-	-	-	1	1
32 gaz lib sec	-	-	-	-	-	4

TABLE TWO a

	Milan AM.XV.36 SETR	London CA15F-001 SETR	Milan Inc.422 SETR	Florence Palat D.7.1.5 SETR	Vatican City Stamp.Barb. AAA.IV.15 SETR
1 frontispiece	4	1	1	4	4
2 in quale libro	-	-	-	-	-
3 liber primus	-	4	4	4	4
4	-	4	2	2	-
5	-	2	2	-	2
6	4	-	4	-	-
7	-	-	-	-	-
8	4	4	4	4	4
9	-	4	-	4	4
10	2	-	-	3	-
11	3	-	-	-	4
12	4	-	-	-	-
13	3	-	2	-	-
14	-	2	2	-	-
15 liber secundus	4	2	3	2	4
16	4	-	-	4	-
17	-	3	3	-	2
18	-	-	-	-	-
19	3	-	-	3	3
20	-	3	-	2	3
21	4	-	4	-	-
22	-	-	4	-	2
23	4	-	1	1	-
24	-	-	-	-	-
25	1	1	1	1	1
26	-	4	-	-	4
27	4	3	-	3	-
28	-	4	-	4	4
29	-	-	1	1	1
30	1	-	1	1	-
31	-	1	-	-	-
32 gaz lib sec	1	-	1	CE	1

TABLE TWO a

		Florence Inc.I.5 FEFR	Turin XV.I.42 FEFR	Rome Inc.541 FEFR	Rome 70.1.G.5 FEFR	Amsterdam Meo 376 FEFR	Florence Magl. Inc. N_20 FEFR
33 gaz lib sec		-	1	-	-	-	-
34 gaz lib sec		-	-	1	-	1	1
35 gaz lib sec		-	1	-	-	-	1
36 interleaf 1		1	-	-	-	1	-
37 liber tertius		-	-	-	-	-	1
38		1	-	1	-	1	-
39		-	1	-	1	1	1
40		1	-	1	-	-	-
41		-	1	-	1	-	1
42		1	1	1	1	1	-
43		1	-	-	1	1	1
44		-	-	-	1	1	-
45		-	1	-	-	4	1
46		1	1	1	1	-	1
47		-	-	-	-	1	-
48		1	-	4	1	-	-
49		1	1	1	-	-	1
50		-	1	1	-	-	-
51		1	-	1	1	-	-
52		1	1	1	1	1	-
53		1	-	1	-	-	-
54		-	-	1	1	-	1
55		1	1	-	-	1	-
56		-	1	-	1	1	1
57		-	-	-	-	-	1
58		-	1	-	-	1	1
59		1	-	1	-	-	1
60		-	1	-	1	1	1
61		1	1	1	1	-	-
62		-	-	-	-	1	1
63 gaz lib tert		1	-	1	-	-	-
64 gaz lib tert		-	1	-	1	1	-

TABLE TWO a

		London PBD 7690 FEFR	Siena O.II.35 FE?	Florence R.A.788 FESR?	Vatican City Stamp.Ferr. S.37 FESR	Rome Vol.Inc.1110 FESR	Florence SEDE.Ed. R.624 FESR
33 gaz lib sec		1	1	-	SS	1	1
34 gaz lib sec		1	-	1	-	-	-
35 gaz lib sec		1	1	1	-	-	-
36 interleaf 1		missing	missing	-	6	1	1
37 liber tertius		1	1	-	1	1	1
38		-	1	1	-	1	-
39		1	-	-	-	missing?	1
40		1	-	1	1	-	-
41		1	-	-	1	-	1
42		-	-	1	-	-	-
43		1	1	-	-	1	1
44		1	1	1	-	1	-
45		-	-	1	-	-	1
46		-	-	-	-	1	-
47		1	1	1	1	-	1
48		1	1	-	4	4	-
49		-	-	-	1	-	1
50		-	-	1	1	-	-
51		1	-	-	1	-	1
52		1	1	1	-	1	1
53		1	-	-	-	1	-
54		1	1	-	1	-	-
55		-	-	1	-	-	1
56		-	1	1	1	missing?	1
57		-	-	-	1	missing?	-
58		-	1	1	-	1	-
59		-	-	1	1	-	1
60		1	1	-	-	-	1
61		-	1	1	-	1	-
62		1	-	-	1	-	1
63 gaz lib tert		-	-	1	1	1	-
64 gaz lib tert		1	1	-	-	1	-

TABLE TWO a

		Lucca Inc.214 FESR	Venice Inc.0037 FESR	Venice Inc.D.013 FESR	Florence D.III.56 FESR	Vatican City Inc.S.120 FESR	London C.1.d.1 FESR
33 gaz lib sec		1	-	SS	-	SS	-
34 gaz lib sec		-	1	-	-	1	1
35 gaz lib sec		1	1	1	-	1	1
36 interleaf 1		1	-	missing	1	-	missing
37 liber tertius		1	1	-	1	1	1
38		1	1	1	1	1	1
39		-	1	-	1	-	1
40		1	-	1	-	1	-
41		-	-	1	-	-	-
42		-	-	1	-	-	-
43		1	1	1	1	1	-
44		-	-	1	1	-	1
45		-	-	1	4	-	-
46		1	1	-	1	1	1
47		-	-	1	-	-	-
48		1	4	-	-	1	1
49		1	1	-	-	1	-
50		-	-	1	-	-	1
51		1	1	1	1	1	1
52		1	1	-	1	-	1
53		-	1	1	1	-	-
54		1	-	-	1	1	1
55		-	1	1	-	-	-
56		1	-	-	-	1	1
57		-	-	1	-	1	-
58		-	-	-	-	-	-
59		-	1	-	1	1	-
60		-	1	1	1	1	-
61		-	-	-	1	1	1
62		1	1	1	-	-	-
63 gaz lib tert		1	-	-	-	-	1
64 gaz lib tert		1	-	1	-	-	1

TABLE TWO a

		Milan AK.XVI.12 SEFR	Rome 70.1.G.7 SEFR	Rome 70.1.G.10 SEFR	Vatican City Stamp.Ross. 301 SESR	Rome 51.G.1 SESR	London C.3.d.10 SESR
33 gaz lib sec		1	1	1	1	-	-
34 gaz lib sec		1	1	-	-	-	-
35 gaz lib sec		-	1	-	-	1	-
36 interleaf 1		missing	missing	1	-	-	missing
37 liber tertius		1	1	-	1	1	-
38		1	1	1	1	-	-
39		-	1	-	-	1	1
40		1	-	1	1	-	-
41		-	-	-	-	1	1
42		-	-	1	-	-	1
43		-	1	1	1	1	1
44		1	-	1	-	-	1
45		1	-	-	-	1	4
46		1	-	1	-	-	-
47		-	1	-	1	1	1
48		-	4	1	4	-	-
49		-	1	-	1	1	-
50		1	-	-	-	-	-
51		-	-	1	1	1	1
52		4	1	1	-	-	1
53		-	-	1	1	1	-
54		-	-	-	1	1	1
55		1	1	1	-	-	-
56		1	1	-	-	-	1
57		-	-	-	1	1	-
58		1	1	-	-	-	-
59		-	1	1	1	-	-
60		-	1	1	1	1	-
61		1	1	1	-	1	1
62		-	-	-	1	-	-
63 gaz lib tert		1	-	-	-	-	1
64 gaz lib tert		1	-	-	-	1	1

TABLE TWO a

		Milan Inc.422bis SESR	London 163.b.1 SESR	Brussels Inc C 208 SETR	London G.8173 SETR	London Crouch 12890 SETR	Turin XV.I.41 SETR
33 gaz lib sec		CE	1	1	1	1	-
34 gaz lib sec		1	1	1	1	-	-
35 gaz lib sec		-	-	-	-	1	1
36 interleaf 1		missing	-	-	missing	missing	missing
37 liber tertius		1	-	-	1	1	1
38		1	1	-	1	1	1
39		1	1	-	-	1	-
40		-	-	1	1	-	1
41		-	-	1	-	-	-
42		-	1	1	-	-	-
43		-	1	1	1	1	-
44		-	-	-	-	1	-
45		-	-	1	1	1	4
46		1	-	1	1	1	-
47		-	1	-	-	-	1
48		1	4	-	-	-	-
49		1	1	1	1	-	1
50		1	-	-	-	-	1
51		-	1	1	-	1	1
52		-	-	1	-	1	1
53		-	-	-	-	1	1
54		1	1	1	-	-	-
55		-	-	-	1	1	1
56		1	1	1	1	-	-
57		1	1	-	1	-	-
58		1	-	-	1	-	-
59		-	-	-	1	-	1
60		1	-	1	1	-	-
61		1	-	1	1	1	1
62		-	1	-	-	-	-
63 gaz lib tert		-	1	-	-	1	1
64 gaz lib tert		1	1	1	-	1	-

TABLE TWO a

		Milan AM.XV.36 SETR	London CA15F-001 SETR	Milan Inc.422 SETR	Florence Palat D.7.1.5 SETR	Vatican City Stamp.Barb. AAA.IV.15 SETR
33 gaz lib sec		-	1	-	-	-
34 gaz lib sec		1	-	1	1	1
35 gaz lib sec		-	1	-	-	1
36 interleaf 1		1	missing	missing	-	-
37 liber tertius		1	-	1	-	1
38		1	1	-	1	1
39		-	1	-	1	-
40		1	-	1	-	1
41		-	-	1	-	-
42		-	1	-	1	-
43		-	-	-	-	1
44		-	-	-	-	1
45		4	-	-	-	-
46		-	1	1	-	-
47		1	-	-	1	1
48		-	1	4	4	4
49		1	1	1	1	-
50		1	1	1	1	-
51		-	1	-	1	1
52		1	-	4	1	-
53		1	1	1	1	-
54		-	1	1	1	1
55		1	-	-	-	-
56		-	-	-	-	1
57		-	1	-	-	1
58		1	-	1	-	-
59		-	-	-	-	-
60		1	-	1	1	-
61		1	-	-	1	-
62		-	1	1	-	1
63 gaz lib tert		-	1	-	-	1
64 gaz lib tert		1	1	1	1	1

TABLE TWO a

	Florence Inc.I.5 FEFR	Turin XV.I.42 FEFR	Rome Inc.541 FEFR	Rome 70.1.G.5 FEFR	Amsterdam Meo 376 FEFR	Florence Magl. Inc. N_20 FEFR
65 gaz lib tert	-	1	-	-	-	1
66 gaz lib tert	1	-	1	-	-	1
67 gaz lib tert	-	1	-	1	1	-
68 interleaf 2	1	-	1	1	1	-
69 liber quartus	2	4	-	3	-	4
70	4	-	-	3	-	4
71	-	-	-	3	-	-
72	2	2	3	-	3	2
73	-	2	4	-	4	-
74	-	-	4	-	4	-
75	-	2	2	-	-	2
76	4	-	-	-	2	4
77	3	-	3	2	-	2
78	2	3	-	3	2	3
79	-	-	2	-	-	-
80	-	2	-	-	3	-
81 gaz lib quart	-	2	4	3	-	-
82 gaz lib quart	-	4	4	-	-	-
83 gaz lib quart	4	-	-	4	4	1
84 liber quintus	3	-	-	3	3	-
85	2	2	-	2	-	-
86	3	3	2	-	-	2
87	2	-	3	2	2	2
88	-	-	-	-	2	3
89	3	2	2	3	-	-
90	-	2	-	-	-	-
91	-	-	-	2	3	-
92	-	-	2	-	3	2
93	2	-	2	2	2	3
94	2	-	-	-	-	-
95	-	-	2	3	2	-
96	-	-	2	2	-	-

TABLE TWO a

	London PBD 7690 FEFR	Siena O.II.35 FE?	Florence R.A.788 FESR?	Vatican City Stamp.Ferr. S.37 FESR	Rome Vol.Inc.1110 FESR	Florence SEDE.Ed. R.624 FESR
65 gaz lib tert	-	1	1	-	-	1
66 gaz lib tert	1	1	-	-	1	1
67 gaz lib tert	-	-	1	1	-	-
68 interleaf 2	missing	-	-	-	missing	missing
69 liber quartus	-	4	3	-	missing?	3
70	-	4	-	4	-	-
71	2	2	3	-	-	3
72	-	-	-	3	3	-
73	4	-	4	-	-	4
74	3	-	-	2	4	-
75	3	-	-	-	-	3
76	2	4	4	-	3	-
77	2	-	3	3	3	-
78	-	2	3	-	-	2
79	2	-	-	3	3	-
80	-	3	-	-	-	3
81 gaz lib quart	-	-	-	3	-	2
82 gaz lib quart	-	-	4	1	-	-
83 gaz lib quart	1	4	-	-	4	1
84 liber quintus	-	3	2	3	3	-
85	3	-	-	3	3	-
86	3	2	-	-	2	-
87	-	2	2	2	2	-
88	2	-	2	-	-	-
89	-	3	-	3	2	3
90	2	-	-	-	-	3
91	-	-	2	3	-	3
92	-	2	3	-	-	2
93	2	2	2	-	-	-
94	-	2	2	2	missing?	-
95	2	-	-	3	2	-
96	-	-	2	3	2	-

TABLE TWO a

	Lucca Inc.214 FESR	Venice Inc.0037 FESR	Venice Inc.D.013 FESR	Florence D.III.56 FESR	Vatican City Inc.S.120 FESR	London C.1.d.1 FESR
65 gaz lib tert	-	-	-	-	1	-
66 gaz lib tert	-	1	-	1	1	-
67 gaz lib tert	1	-	1	-	-	1
68 interleaf 2	1	1	missing	1	-	missing
69 liber quartus	-	-	4	-	2	2
70	-	-	4	-	-	4
71	-	4	3	2	-	-
72	3	-	-	-	3	2
73	3	3	-	4	4	-
74	4	4	-	4	-	-
75	-	-	-	-	2	2
76	4	4	4	2	4	-
77	2	2	-	3	-	3
78	-	2	3	2	-	3
79	3	-	-	-	2	-
80	-	-	3	-	3	-
81 gaz lib quart	-	-	-	-	-	-
82 gaz lib quart	-	-	-	1	1	-
83 gaz lib quart	1	1	4	-	-	1
84 liber quintus	2	3	4	3	-	-
85	-	-	3	-	3	-
86	-	2	-	2	2	2
87	-	2	3	-	-	-
88	2	2	2	2	-	2
89	-	-	-	-	2	-
90	2	-	-	2	3	3
91	3	-	3	-	-	-
92	3	2	-	2	-	3
93	-	-	2	3	2	-
94	-	3	3	-	3	2
95	-	-	-	3	3	3
96	2	2	2	2	2	2

TABLE TWO a

	Milan AK.XVI.12 SEFR	Rome 70.1.G.7 SEFR	Rome 70.1.G.10 SEFR	Vatican City Stamp.Ross. 301 SESR	Rome 51.G.1 SESR	London C.3.d.10 SESR
65 gaz lib tert	1	1	-	1	-	1
66 gaz lib tert	-	1	1	-	-	1
67 gaz lib tert	1	-	-	1	1	-
68 interleaf 2	-	missing	1	missing	?	missing
69 liber quartus	-	-	4	-	-	4
70	4	3	-	-	4	-
71	-	-	-	-	-	-
72	4	3	4	3	3	3
73	-	-	3	2	-	4
74	3	4	-	4	3	-
75	-	-	2	2	-	2
76	4	4	4	4	4	4
77	3	2	3	3	3	-
78	2	-	-	-	3	-
79	-	3	2	3	-	2
80	-	-	-	-	-	2
81 gaz lib quart	-	-	-	-	-	-
82 gaz lib quart	-	-	-	-	4	4
83 gaz lib quart	1	1	1	4	-	-
84 liber quintus	3	3	-	-	4	-
85	-	3	2	-	1	2
86	2	-	2	-	-	2
87	2	-	-	-	-	-
88	2	2	-	-	2	-
89	-	-	3	3	-	3
90	-	2	3	3	3	3
91	-	2	-	2	3	-
92	3	-	-	3	-	-
93	-	2	-	2	2	2
94	-	2	3	-	2	-
95	-	3	-	-	2	-
96	-	-	-	2	2	-

TABLE TWO a

	Milan Inc.422bis SESR	London 163.b.1 SESR	Brussels Inc C 208 SETR	London G.8173 SETR	London Crouch 12890 SETR	Turin XV.I.41 SETR
65 gaz lib tert	1	1	-	-	-	-
66 gaz lib tert	1	-	-	1	-	1
67 gaz lib tert	-	1	1	-	1	-
68 interleaf 2	missing	-	1	missing	missing	missing
69 liber quartus	2	-	3	-	2	3
70	-	3	2	-	-	-
71	-	-	4	2	3	-
72	2	3	-	-	-	2
73	4	-	-	4	4	3
74	-	4	-	3	-	-
75	2	-	-	-	-	-
76	4	4	4	-	-	-
77	-	-	2	-	3	-
78	3	-	-	-	-	3
79	-	2	2	2	2	-
80	2	2	-	2	-	2
81 gaz lib quart	-	-	-	3	2	3
82 gaz lib quart	-	1	-	-	-	1
83 gaz lib quart	1	-	4	1	-	-
84 liber quintus	-	3	2	3	4	2
85	3	3	-	-	2	-
86	-	3	-	2	-	2
87	-	3	3	-	3	2
88	2	-	-	3	3	-
89	-	2	3	-	-	2
90	3	-	-	3	3	-
91	3	-	3	-	-	-
92	-	-	3	3	-	3
93	2	2	2	-	3	-
94	2	-	2	3	2	3
95	2	2	2	-	-	-
96	-	-	-	-	-	-

TABLE TWO a

	Milan AM.XV.36 SETR	London CA15F-001 SETR	Milan Inc.422 SETR	Florence Palat D.7.1.5 SETR	Vatican City Stamp.Barb. AAA.IV.15 SETR
65 gaz lib tert	1	-	-	1	1
66 gaz lib tert	-	1	1	1	1
67 gaz lib tert	1	-	-	-	-
68 interleaf 2	-	missing	missing	missing	1
69 liber quartus	4	-	2	-	4
70	3	-	-	-	-
71	2	2	-	-	-
72	-	-	3	2	3
73	-	3	4?	2	4
74	-	4	-	4	-
75	-	-	3	-	2
76	-	2	2	4	-
77	-	3	-	-	2
78	-	3	-	-	2
79	3	-	3	2	-
80	2	-	3	3	-
81 gaz lib quart	3	-	-	-	4
82 gaz lib quart	-	-	1	4	-
83 gaz lib quart	4	4	-	-	1
84 liber quintus	3	2	-	3	-
85	3	3	-	2	2
86	-	2	-	3	-
87	3	3	3	3	-
88	-	2	2	-	2
89	3	-	-	3	-
90	-	-	-	-	3
91	3	-	3	-	3
92	-	-	2	-	-
93	-	2	2?	2	-
94	2	-	-	-	-
95	-	-	-	-	2
96	3	3	2	3	-

TABLE TWO a

		Florence Inc.I.5 FEFR	Turin XV.I.42 FEFR	Rome Inc.541 FEFR	Rome 70.1.G.5 FEFR	Amsterdam Meo 376 FEFR	Florence Magl. Inc. N_20 FEFR
97		2	1	-	-	3	3
98		2	3	-	-	-	3
99		-	3	2	3	3	2
100		-	3	-	-	-	-
101 gaz lib quint		-	1	1	4	-	-
102 gaz lib quint		4	1	1	4	4	-
103 gaz lib quint		-	-	-	-	-	4
104 gaz lib quint		1	-	-	-	4	1
105 liber sextus		-	4	-	-	4	4
106		-	2	4	-	-	3
107		-	-	-	-	-	3
108		-	2	2	1	-	3
109		3	-	-	-	1d3	-
110		0	3	2	2	2	-
111		4	-	-	4	4	-
112		4	-	4	2	-	-
113 gaz lib sext		-	1	1	-	1	-
114 gaz lib sext		4	4	4	1	-	-
115 gaz lib sext		-	-	-	-	4	1
116 interleaf 3		1	-	-	1	-	1
117 liber septimus		4	-	4	4	-	4
118		3	0	-	-	0	3
119		-	-	2	3	-	2
120		-	-	-	-	-	2
121		-	-	-	3	4	4
122		2	4	4	-	-	-
123		3	2	3	3	2	-
124 gaz lib sept		4	3	-	-	3	-
125 gaz lib sept		-	-	2	0	-	-
126 interleaf 4		-	4	-	-	missing	missing
127 register		not present	not present	not present	not present	not present	not present

TABLE TWO a

		London PBD 7690 FEFR	Siena O.II.35 FE?	Florence R.A.788 FESR?	Vatican City Stamp.Ferr. S.37 FESR	Rome Vol.Inc.1110 FESR	Florence SEDE.Ed. R.624 FESR
97		3	3	-	-	-	3
98		-	3	3	-	-	2
99		3	-	-	-	3	2
100		-	-	-	2	missing	3
101 gaz lib quint		-	-	1	-	1	-
102 gaz lib quint		-	-	-	-	1	4
103 gaz lib quint		4	-	4	4	-	-
104 gaz lib quint		1	1	-	1	-	1
105 liber sextus		4	4	-	-	-	-
106		2	4	2	-	4	4
107		3	2	3	2	2	-
108		-	2	3	1	1d3	3
109		3	-	-	-	-	-
110		-	-	-	-	-	3
111		-	-	-	3	-	-
112		-	-	3	4	4	3
113 gaz lib sext		-	1	4	-	-	-
114 gaz lib sext		1	-	1	4	4	-
115 gaz lib sext		-	1	-	-	-	4
116 interleaf 3		missing	missing	-	6	1	1
117 liber septimus		-	2	-	4	4	-
118		O	3	2	4	O	-
119		-	-	-	4	2	-
120		-	2	2	-	-	2
121		4	-	-	-	-	-
122		-	4	4	2	4	3
123		4	-	-	4	3	-
124 gaz lib sept		4	-	4	-	-	3
125 gaz lib sept		-	missing	-	-	-	O
126 interleaf 4		missing	missing	4	-	-	-
127 register		added 4	not present	not present	not present	facsimile	not present

TABLE TWO a

		Lucca Inc.214 FESR	Venice Inc.0037 FESR	Venice Inc.D.013 FESR	Florence D.III.56 FESR	Vatican City Inc.S.120 FESR	London C.1.d.1 FESR
97		-	-	-	-	-	-
98		2	2	3	-	-	-
99		3	-	-	3	-	-
100		3	2	-	-	-	3
101 gaz lib quint		1	-	1	-	1	1
102 gaz lib quint		-	4	4	-	-	-
103 gaz lib quint		4	-	-	4	4	1
104 gaz lib quint		-	1	-	1	-	-
105 liber sextus		-	4	-	4	-	-
106		4	-	4	4	-	2
107		2	0	-	2	-	-
108		-	-	2	3	-	2
109		3	3	-	-	3	-
110		-	-	3	-	3	3
111		-	3	-	-	3	-
112		4	-	4	-	4	4
113 gaz lib sext		1	1	1	1	1	1
114 gaz lib sext		-	4	-	-	4	4
115 gaz lib sext		1	-	4	1	-	-
116 interleaf 3		missing	-	-	-	-	missing
117 liber septimus		4	-	3	4	3	-
118		0	0	-	-	-	-
119		-	4	-	4	-	2
120		4	2	2	-	-	4
121		4	-	-	-	-	4
122		-	2	3	4	4	-
123		-	-	-	3	4	-
124 gaz lib sept		3	-	3	-	4	-
125 gaz lib sept		-	-	2	3	0	-
126 interleaf 4		-	2	missing	missing	-	missing
127 register		not present	not present	not present	not present	added	not present

TABLE TWO a

		Milan AK.XVI.12 SEFR	Rome 70.1.G.7 SEFR	Rome 70.1.G.10 SEFR	Vatican City Stamp.Ross. 301 SESR	Rome 51.G.1 SESR	London C.3.d.10 SESR
97		3	2	3	-	-	3
98		3	-	3	3	-	3
99		3	-	-	3	-	3
100		3	-	3	-	-	-
101 gaz lib quint		-	-	1	-	-	-
102 gaz lib quint		-	4	-	4	4	4
103 gaz lib quint		1	-	1	-	-	-
104 gaz lib quint		1	1	-	1	1	1
105 liber sextus		4	4	4	-	4	-
106		-	-	4	4	2	4
107		3	3	3	3	3	3
108		2	-	2	1	2	-
109		-	3	-	-	-	1d3
110		-	-	-	-	-	-
111		4	4	-	-	-	-
112		-	-	-	4	-	4
113 gaz lib sext		1	1	-	-	-	1
114 gaz lib sext		-	-	4	4	-	4
115 gaz lib sext		4	1	-	-	4	-
116 interleaf 3		missing	missing	missing	1	1	missing
117 liber septimus		-	-	4	3	-	4
118		3	-	-	2	-	-
119		2	2	-	-	4	4
120		2	2	4	3	4	2
121		-	-	2	-	-	4
122		3	4	-	4	4	-
123		-	-	-	-	-	-
124 gaz lib sept		-	-	4	4	-	-
125 gaz lib sept		-	2	2	-	2	2
126 interleaf 4		missing	missing	-	missing	missing	missing
127 register		4	4	-	-	4	-

TABLE TWO a

		Milan Inc.422bis SESR	London 163.b.1 SESR	Brussels Inc C 208 SETR	London G.8173 SETR	London Crouch 12890 SETR	Turin XV.I.41 SETR
97		2	3	3	2	3	3
98		-	-	-	2	2	2
99		-	3	-	-	-	-
100		-	-	-	2	3	3
101 gaz lib quint		-	-	1	1	-	-
102 gaz lib quint		4	-	-	4	-	4
103 gaz lib quint		-	1	4	-	4	-
104 gaz lib quint		1	1	-	-	1	1
105 liber sextus		-	4	-	-	4	4
106		4	-	-	2	-	3
107		0	3	-	-	-	3
108		-	1	3	2	2	2
109		3	-	-	-	-	-
110		-	-	3	2	3	-
111		-	4	3	-	4	-
112		4	-	4	4	-	-
113 gaz lib sext		1	-	-	-	1	-
114 gaz lib sext		-	-	4	4	-	-
115 gaz lib sext		4	4	-	-	4	4
116 interleaf 3		missing	1	CE	missing	missing	1
117 liber septimus		-	4	-	4	-	-
118		2	-	-	-	3	0
119		-	-	-	-	4	-
120		3	-	2	-	2	-
121		4	-	-	4	4	4
122		-	4	4	-	-	-
123		-	2	-	3	-	4
124 gaz lib sept		3	3	3	4	-	4
125 gaz lib sept		-	3	0	3	-	-
126 interleaf 4		missing	missing	missing	missing	missing	missing
127 register		facsimile	-	4	-	4	3d

TABLE TWO a

		Milan AM.XV.36 SETR	London CA15F-001 SETR	Milan Inc.422 SETR	Florence Palat D.7.1.5 SETR	Vatican City Stamp.Barb. AAA.IV.15 SETR
97		-	-	-	-	3
98		3	3	2	2	-
99		-	3	3	3	3
100		3	-	-	-	2
101 gaz lib quint		1	1	-	-	1
102 gaz lib quint		4	-	-	1	4
103 gaz lib quint		-	4	4	-	-
104 gaz lib quint		-	-	4	1	-
105 liber sextus		-	-	4	4	4
106		-	-	-	2	4
107		-	2	3	-	2
108		3	2	-	-	-
109		-	-	3	3	2
110		0	-	-	3	-
111		4	3	4	-	-
112		3	4	-	-	-
113 gaz lib sext		-	-	-	1	-
114 gaz lib sext		4	-	-	-	4
115 gaz lib sext		-	4	4	4	-
116 interleaf 3		1	missing	missing	missing	1
117 liber septimus		4	4	4	4	-
118		-	2	2	-	2
119		4	-	4	2	3
120		-	-	-	-	-
121		-	-	4	-	2
122		4	2	-	4	-
123		4	3	4	3	3
124 gaz lib sept		-	0	-	-	-
125 gaz lib sept		0	-	-	2	-
126 interleaf 4		missing	missing	missing	missing	missing
127 register		-	?	-	-	4

TABLE TWO b

	Vatican City Inc.S.120 page order	Vatican City Inc.S.120 printing order			Vatican City Inc.S.120 page order	Vatican City Inc.S.120 printing order	
1 frontispiece	4	2	liber quart 69	33 gaz lib sec	SS	-	107
2 in quale libro	-	-	70	34 gaz lib sec	1	-	108
3 liber primus	-	-	71	35 gaz lib sec	1	3	109
4	-	3	72	37 liber tert	1	3	110
5	2	4	73	38	1	3	111
6	4	-	74	39	-	4	112
7	-	2	75	40	1	3	liber sept 117
8	4	4	76	41	-	-	118
9	-	-	77	42	-	-	119
10	-	-	78	43	1	-	120
11	4	2	79	44	-	-	121
12	3	3	80	45	-	4	122
13	-	-	gaz lib quart 81	46	1	4	123
14	-	-	liber quint 84	47	-	4	gaz lib sept 124
15 liber sec	-	3	85	48	1	O	gaz lib sept 125
16	2	2	86	49	1	-	liber primus 4
17	-	-	87	50	-	2	5
18	3	-	88	51	1	4	6
19	2	2	89	52	-	-	7
20	3	3	90	53	-	4	8
21	4	-	91	54	1	-	9
22	-	-	92	55	-	-	10
23	-	2	93	56	1	4	11
24	-	3	94	57	1	3	12
25	1	3	95	58	-	-	13
26	4	2	96	59	1	-	14
27	3	-	97	60	1	-	liber sec 15
28	-	-	98	61	1	2	16
29	1	-	99	62	-	-	17
30	-	-	100	63 gaz lib tert	-	3	18
31	-	-	liber sextus 105	64 gaz lib tert	-	2	19
32 gaz lib sec	-	-	106	65 gaz lib tert	1	3	20

Page 81, the first page of the gazetteer of LIBER QVARTVS, is mentioned twice in the fourth column, the rightmost one, because this is the only page in the *Geography* that is printed twice, the first time with the regular text, the second time with the text of the gazetteer.

TABLE TWO b

	Vatican City Inc.S.120 page order	Vatican City Inc.S.120 printing order			Vatican City Inc.S.120 page order	Vatican City Inc.S.120 printing order	
66 gaz lib tert	1	4	21	99	-	-	58
67 gaz lib tert	-	-	22	100	-	1	59
69 liber quart	2	-	23	101 gaz lib quint	1	1	60
70	-	-	24	102 gaz lib quint	-	1	61
71	-	1	25	103 gaz lib quint	4	-	62
72	3	4	26	104 gaz lib quint	-	-	gaz lib sec 32
73	4	3	27	105 liber sext	-	SS	gaz lib sec 33
74	-	-	28	106	-	1	gaz lib sec 34
75	2	1	29	107	-	1	gaz lib sec 35
76	4	-	30	108	-	-	gaz lib tert 63
77	-	-	31	109	3	-	gaz lib tert 64
78	-	1	liber tertius 37	110	3	1	gaz lib tert 65
79	2	1	38	111	3	1	gaz lib tert 66
80	3	-	39	112	4	-	gaz lib tert 67
81 gaz lib quart	-	1	40	113 gaz lib sext	1	-	gaz lib quart 81
82 gaz lib quart	1	-	41	114 gaz lib sext	4	1	gaz lib quart 82
83 gaz lib quart	-	-	42	115 gaz lib sext	-	-	gaz lib quart 83
84 liber quint	-	1	43	117 liber sept	3	1	gaz lib quint 101
85	3	-	44	118	-	-	gaz lib quint 102
86	2	-	45	119	-	4	gaz lib quint 103
87	-	1	46	120	-	-	gaz lib quint 104
88	-	-	47	121	-	1	gaz lib sext 113
89	2	1	48	122	4	4	gaz lib sext 114
90	3	1	49	123	4	-	gaz lib sext 115
91	-	-	50	124 gaz lib sept	4	4	frontispiece 1
92	-	1	51	125 gaz lib sept	O	-	in quale libro 2
93	2	-	52	127 register	added -	-	liber primus 3
94	3	-	53	36 interleaf 1	-	added -	register 127
95	3	1	54	68 interleaf 2	-	-	interleaf 1 36
96	2	-	55	116 interleaf 3	-	-	interleaf 2 68
97	-	1	56	126 interleaf 4	-	-	interleaf 3 116
98	-	1	57			-	interleaf 4 126

Page 81, the first page of the gazetteer of LIBER QVARTVS, is mentioned twice in the fourth column, the rightmost one, because this is the only page in the *Geography* that is printed twice, the first time with the regular text, the second time with the text of the gazetteer.

TABLE THREE

	INTERLEAF 36	INTERLEAF 68	INTERLEAF 116	INTERLEAF 126	PRECEDING Asia 8	PRECEDING Asia 9
Florence Inc.I.5 FEFR	CH 1a	CH 1d	CH 1b	-	CROC	-
Turin XV.I.42 FEFR	-	-	-	CH 4a	LIC 1	LIC 1
Rome Inc.541 FEFR	-	CH 1d	-	-	LIC 1	-
Rome 70.1.G.5 FEFR	-	CH 1c	CH 1a	-	-	COM
Amsterdam Me 0376 FEFR	CH 1b	CH 1d	-	missing	CROWC	LIC 2
Florence Magl. Inc. N_20 FEFR	-	-	CH 1a	missing		
Siena O.II.35 FE?	missing	-	missing	missing		
Florence R.A.788 FESR?	-	-	-	CH 4a		
Vatican City Stamp. Ferr.S.37 FESR	CH 6	-	CH 6	-		
Rome Vol.Inc.1110 FESR	CH 1b	missing	CH 1a	-		
Florence SEDE. Ed.R.624 FESR	CH 1a	missing	CH 1c	-		
Lucca Inc.214 FESR	CH 1a	CH 1c	missing	-		
Venice Inc.0037 FESR	-	CH 1c	-	CH2a	-	-
Venice Inc.D.013 FESR	missing	missing	-	missing		
Florence D III 56 FESR	CH 1	CH 1c	-	missing		
Vatican City Inc.S.120 FESR	-	-	-	-		
Milan AK.XVI.12 SEFR	missing	-	missing	missing		
Rome 70.1.G.10 SEFR	CH 1a	CH 1c	missing	-		
Vatican City Stamp. Ross.301 SESR	-	missing	CH 1d	missing		
Rome 51.G.1 SESR	-	CH	CH	missing		
London 163.b.1 SESR	-	-	CH 1a	missing		
Brussels Inc C 208 SETR	-	1	CE	missing		
Turin XV.I.41 SETR	missing	missing	CH 1d	missing		
Milan AM.XV.36 SETR	CH 1a	-	CH 1a	missing		
Florence Palat D.7.1.5 SETR	-	missing	missing	missing		
Vatican City Stamp. Barb. AAA.IV.15 SETR	-	CH 1d	CH 1d	missing		

TABLE FOUR

	Florence Inc.I.5 FEFR			Turin XV.I.42 FEFR			Rome Inc.541 FEFR			Rome 70.1.G.5 FEFR		
	backing	map	state	backing	map	state	backing	map	state	backing	map	state
World L		CH 1c	1	S	SS	1		CH	1			1
World R	CH 1c						S			CH 1c	CH	
Eur 1 L			1			1		CH	1	CH 1d	CH 1c	1
Eur 1 R	CH 1d			S			LIC 1c					
Eur 2 L	CH 1c		1	S		1		CH	1	CH 1c		1
Eur 2 R					CH 1		SS				CH 1d	
Eur 2 N L		SS	1	S		1	S		1			1
Eur 2 N R	CH 1c							CH		CH	CH 1c	
Eur 3 L			1	S	CH 1c	1			1		CH 1c	1
Eur 3 R	CH 1c	SS					S	CH		CH 1c		
Eur 3 N L			1		CH 1c	1		CH	1	CH 1c	CH 1d	2
Eur 3 N R	CH 1d	CH 1d		S			S					
Eur 4 L			1	S	CH 1d	1	SS		1	CH 1c		1
Eur 4 R	CH 1c	CH 1c						SS			CH 1d	
Eur 5 L	CH 1c	SS	2	S		1	S	CH 5	1			1
Eur 5 R										CH 5?	CH 1d	
Eur 6 L	CH 1c		1	S		1	S		1	CH 1d		1
Eur 6 R							S	CH			CH 1c	
Eur 6 N L	CH 1d		1			1		SS	1	CH 1c	CH	1
Eur 6 N R				S			S					
Eur 7 L	CH 1d		2			2			2			2
Eur 7 R					CH		S	SS		CH 1d	CH 1c	
Eur 8 L	CH 1c		1			1			1			1
Eur 8 R				S	CH 1c		S	CH 5		CRERC	CH 1c	
Eur 9 L	missing	missing				1	SS	SS	1	CH 1c	CH 1c	2
Eur 9 R	missing	missing		S	CH 1c							
Eur 10 L	missing	missing		S		1		CH	1	CH 1c	CH	1
Eur 10 R	missing	missing					S					
Afr 1 L			1	S	CH	1	S		1	CH 1d	CH 1c	1
Afr 1 R	CH 1d			CH	CH		S	CH 5				

TABLE FOUR

[illegible]

TABLE FOUR

	Florence Inc. 34 FEFR			Amsterdam Me 0376 FEFR			Naples S.Q.X.K.15 FEFR			Florence Magl.Inc.N_20 FEFR		
	backing	map	state	backing	map	state	backing	map	state	backing	map	state
World L			1	LIC 2		1	S	CH				2
World R							LIC 1	according		CE		
Eur 1 L			1			1	CRERC	library		MCC		2
Eur 1 R				LIC 2			on			AC		
Eur 2 L			1	LIC 2c	CH	1	images		1	AC		2
Eur 2 R							received					
Eur 2 N L			?		CH	1			?	CE		1
Eur 2 N R				LIC 2b							CH	
Eur 3 L			1			1			1	SS		1
Eur 3 R				SI						CE		
Eur 3 N L			1		CH 5	1						2
Eur 3 N R				SI 1a						CE	CH 1d	
Eur 4 L			1	SI		1			1			1
Eur 4 R					CH 5						CH	
Eur 5 L			1	SI 1b	CH	1			1	CH 1c		1
Eur 5 R										CE		
Eur 6 L			1	SI		1						1
Eur 6 R											CH	
Eur 6 N L			1	SI		1						2
Eur 6 N R					CH					AC		
Eur 7 L			2			2				AC		2
Eur 7 R				SI								
Eur 8 L			1	SI	CH	1				CE 2		2
Eur 8 R												
Eur 9 L	LIC 1		1			2						2
Eur 9 R				SI						CE	CH 1c	
Eur 10 L			1		CH	1				CE		2
Eur 10 R				SI								
Afr 1 L			1	SI		1				CE	CH	1
Afr 1 R					CH							

TABLE FOUR

	Florence Inc. 34 FEFR			Amsterdam Me 0376 FEFR			Naples S.Q.X.K.15 FEFR			Florence Magl.Inc.N_20 FEFR		
	backing	map	state	backing	map	state	backing	map	state	backing	map	state
Afr 2 L	LIC 1		2	CH		3			3	CH		3
Afr 2 R				SI						CE		
Afr 3 L			1	SI		1				CE		1
Afr 3 R										CH		
Afr 4 L			1	CH		1				CE	CH	1
Afr 4 R				SI								
Asi 1 L			1	SI		1						1
Asi 1 R				CH								
Asi 2 L			1	SI		1						1
Asi 2 R	LIC 1			CH 5						CE	CH 1c	
Asi 3 L	LIC 1		1	SI		1			2			1
Asi 3 R										CE	CH 1c	
Asi 4 L			1	CH 5		1				CE		1
Asi 4 R				CROWC						CH 1c		
Asi 4 N L			1			1						1
Asi 4 N R				CROWC						CE		
Asi 5 L			1	CH 5		1						1
Asi 5 R				CROWC						CE		
Asi 6 L	LIC 1		1	CROWC 1a		1				CE		1
Asi 6 R				CH 5								
Asi 7 L			1	CROWC	CH	1			1			1
Asi 7 R	CH 1d									CE		
Asi 8			1	CROWC	CH 5	1				CE	CH 1d	1
Asi 9			1			1						1
Asi 10 L			1	CH		1				AC		2
Asi 10 R				CROWC								
Asi 11 L	LIC 1		1	CROWC 1b		1				CE		1
Asi 11 R										CH 1d		
Asi 12 L			2	CH		2						2
Asi 12 R				LIC 2						CE	CH	

TABLE FOUR

	London PBD 7690 FEFR			Florence R.A.788 FESR?			Vatican City Stamp.Ferr.S.37 FESR			Rome Vol.Inc.1110 FESR		
	backing	map	state	backing	map	state	backing	map	state	backing	map	state
World L		CH 1d	2			2	X	missing		X	P	2
World R				ACS 1			X	missing		X	P	
Eur 1 L		CROC 1	2	ACS 1	CH	2	X		2	X	P	2
Eur 1 R							X	MCC		X	P	
Eur 2 L	COL	CH 1d	1	ACS 1		2	X		2	X	P	2
Eur 2 R							X	P		X	MCC	
Eur 2 N L		SS	1	ACS 1		2	X		2	X	P	2
Eur 2 N R							X	CH 6a		X	P	
Eur 3 L	X	B 1a	2		MCC	2	X	P	2	X	P	2
Eur 3 R	X			ACS 1	MCC		X			X	P	
Eur 3 N L	COL		P	ACS 1	MCC	2	X	CH 6b	2	X	CH 1c	2
Eur 3 N R		SS			MCC		X			X		
Eur 4 L		CH 1d	1	GCC		1	X	P	2	X	P	2
Eur 4 R	COL				CH 1c		X	MCC		X	P	
Eur 5 L	COL		2		SS	2	X	P	3	X	MCC	3
Eur 5 R		SS					X	P		X	P	
Eur 6 L			P			2	X	missing		X	P	2
Eur 6 R		SS		ACS 1			X	missing		X	P	
Eur 6 N L	X	ACS 3	2			2	X		2	X		2
Eur 6 N R	X			ACS 1			X	CH 6c		X	P	
Eur 7 L			1			2	X		1	X	P	2
Eur 7 R		SS			LI		X	SS		X	MCC	
Eur 8 L	COL	CH 1c	2	ACS 1		1	X	P	2	X	P	2
Eur 8 R					CH 1d		X	P		X	P	
Eur 9 L		CH 1d	3	ACS 1		3	X	P	3	X	P	3
Eur 9 R					P		X	P		X	P	
Eur 10 L		CH 1d	2			2	X	P	2	X	CH 7a	2
Eur 10 R							X	P		X	CH 7b1	
Afr 1 L		SS	1	ACS 1		2	X	MCC	2	X	P	2
Afr 1 R							X	MCC		X	P	

TABLE FOUR

	London PBD 7690 FEFR			Florence R.A.788 FESR?			Vatican City Stamp.Ferr.S.37 FESR			Rome Vol.Inc.1110 FESR		
	backing	map	state	backing	map	state	backing	map	state	backing	map	state
Afr 2 L			1	ACS 1		3	X	P	3	X	P	3
Afr 2 R	COL	SS					X	P		X	P	
Afr 3 L	COL		1			2	X	P	2	X		2
Afr 3 R		CH		ACS 1			X	P		X	P	
Afr 4 L		SS	P	ACS 1	CH 7b2	2	X	P	2	X	MCC	2
Afr 4 R					CH 7c		X	MCC		X	P	
Asi 1 L		CH	1	ACS 1		2	X	P	2	X	P	2
Asi 1 R		CH					X	P		X	P	
Asi 2 L	CRE		2	missing	missing		X		2	X		2
Asi 2 R		CH 1d		missing	missing		X	P		X	P	
Asi 3 L	CH 1c	CH	3		P	3	X	MCC	3	X	P	3
Asi 3 R				ACS 1	P		X			X	P	
Asi 4 L			2			2	X	CROC	2	X	P	2
Asi 4 R	CH 6j	CH		ACS 1	MCC		X			X	P	
Asi 4 N L	X	CRECC 1d	1			1	X		1	X	P	1
Asi 4 N R	X			ACS 1	P		X	CH 6d		X	P	
Asi 5 L	X	CRECC 1a	2		P	2	X		2	X		2
Asi 5 R	X			ACS 1			X	P		X	CH 1c	
Asi 6 L			2			2	X	P	2	X	P	2
Asi 6 R		CH 1d		ACS 1			X	P		X	P	
Asi 7 L		CROC	2	ACS 1	MCC	2	X		2?	X	P	2
Asi 7 R	COL				MCC		X	MCC		X	P	
Asi 8		CH 1c	2	ACS 1	P	2	X	LA in ?	2	X	P	2
Asi 9	COL		2			2	X	NOW	2	X	P	2
Asi 10 L			2	ACS 1		2	X	P	2	X	P	2
Asi 10 R	COL	SS					X	MCC		X	P	
Asi 11 L	X	ACS 3	1			1	X	P	1	X	P	1
Ais 11 R	X			ACS 1			X	P		X	P	
Asi 12 L	X		3		CH 8	3	X	P	3	X	P	3
Asi 12 R	X	CRECC 1a					X	P		X	P	

TABLE FOUR

	Florence SEDE.Ed.R.624 FESR			Lucca Inc.214 FESR			Venice Inc.0037 FESR			Venice Inc.D.013 FESR		
	backing	map	state	backing	map	state	backing	map	state	backing	map	state
World L	CH 6	MCC	2			2		P	2	CRE		2
World R		MCC		CKCC				P			MCC	
Eur 1 L		MCC	2	CKCC		2			2	CRE		2
Eur 1 R	CH 6	MCC			P						P	
Eur 2 L	CH 6i		2			2		CH7?	2			2
Eur 2 R		MCC		CKCC							P	
Eur 2 N L	CH 6i	MCC	2			2		P	2	CRE		2
Eur 2 N R		MCC		CKC	P			CH7?				
Eur 3 L		MCC	2	CKCC		2		P	2		P	2
Eur 3 R	CH 6g	MCC						P		CRE		
Eur 3 N L	CH 6e	MCC	2	CKCC		2	CH		2		MCC	2?
Eur 3 N R		MCC									P	
Eur 4 L		MCC	2		MCC	2		P	2		P	2
Eur 4 R	CH 6g			CKCC	MCC					CRE	P	
Eur 5 L		MCC	3		MCC	3	CH		3	CRE		3
Eur 5 R	CH 6	MCC		CKC								
Eur 6 L	CH 6	MCC	2	CRE		2			2		P	2
Eur 6 R		MCC					CH	P		CRE		
Eur 6 N L	CH 6h	MCC	2			2			2			2
Eur 6 N R		MCC		CKC				P			P	
Eur 7 L		MCC	2	CKC	P	2		P	2		MCC	2
Eur 7 R	CH 6	MCC						P		CRE	MCC	
Eur 8 L		MCC	2		MCC	2		MCC	2		CH7?	2
Eur 8 R	CH 6i	MCC		CKCC				P		CRE		
Eur 9 L	CH 6j	MCC	3	CRE	P	3		P	3	CRE		3
Eur 9 R		MCC					CH	MCC			P	
Eur 10 L	CH 6e		2		P	2			2	LASS		2
Eur 10 R		MCC		CKCC				P				
Afr 1 L	CH 6g	P	2			2		P	2	CRE	P	2
Afr 1 R		P		CKCC			CH	P				

TABLE FOUR

	Florence SEDE.Ed.R.624 FESR			Lucca Inc.214 FESR			Venice Inc.0037 FESR			Venice Inc.D.013 FESR		
	backing	map	state	backing	map	state	backing	map	state	backing	map	state
Afr 2 L		MCC	3	CKCC	P	3		P	3	CH6		3
Afr 2 R	CH 6k	MCC						P			P	
Afr 3 L		MCC	2	CKCC		2		P	2	CRE	P	2
Afr 3 R	CH 6k	MCC										
Afr 4 L			2			2			2		P	2
Afr 4 R	CH 6			CKCC	P					CRE		
Asi 1 L	CH 6j	MCC	2			2	CH		2			2
Asi 1 R				CKCC				P		CRE	P	
Asi 2 L	CH 6j	MCC	2		P	2		P	2	CRE	P	2
Asi 2 R		MCC		CKCC	P			P			P	
Asi 3 L		MCC	3			3	CH		3	CH6	P	3
Asi 3 R	CH 6l	MCC		CKCC				P			P	
Asi 4 L		MCC	2	CKCC	P	2			2	missing	missing	
Asi 4 R	CH 6k	MCC						P		missing	missing	
Asi 4 N L	CH 6i	MCC	1		MCC	1		P	1	missing	missing	
Asi 4 N R		MCC		CKCC				P		missing	missing	
Asi 5 L	CH 6g	MCC	2			2			2		P	2
Asi 5 R		MCC		CKCC	P		CH	P		CRE	MCC	
Asi 6 L		MCC	2		P	2	CH		2	CRE	MCC	2
Asi 6 R	CH 6e	MCC		CKCC	P			CH7?			P	
Asi 7 L		MCC	2			2		P	3			2
Asi 7 R	CH 6e	MCC		CKCC				P		CRE		
Asi 8		MCC	2	CKCC	P	2	CH	P	2		CH7	2
Asi 9	CH 6l	MCC	2			2	CH	P	2	CH6		2
Asi 10 L	CH 6g	MCC	2		P	2		MCC	2	CRE	MCC	2
Asi 10 R		MCC		CKCC				P				
Asi 11 L	CH 6h	MCC	1			1			1	CRE		1
Asi 11 R		MCC		CKCC				P			P	
Asi 12 L		MCC	3	missing	missing				3		P	3
Asi 12 R	CH 6k	MCC		missing	missing			P		CRE		

TABLE FOUR

	Florence D III 56 FESR			Vatican City Inc.S.120 FESR			London C.1.d.1 FESR			Milan AK.XVI.13 FESR		
	backing	map	state	backing	map	state	backing	map	state	backing	map	state
World L	missing	missing		MCC		2	X	P	2	missing	missing	
World R	missing	missing					X	P		missing	missing	
Eur 1 L	missing	missing				2	X	P	2			2
Eur 1 R	missing	missing					X	P		SS	CH	
Eur 2 L		MCC	2			2	X	P	2	SS	P	2
Eur 2 R	T			SS			X	P			P	
Eur 2 N L	missing	missing				2	X	CH 7b	2		P	2
Eur 2 N R	missing	missing					X	CH 7c		SS	P	
Eur 3 L		P	2			2	X	CH 7b1	2		P	2
Eur 3 R	T	P			P		X	CH 7c		SS	P	
Eur 3 N L	T	P	2	SS		2	X	CH 1d	2	SS	P	2
Eur 3 N R		CROC 2					X				P	
Eur 4 L		MCC	2			2	X	P	2	SS		2
Eur 4 R	T	MCC			P		X	P				
Eur 5 L	missing	missing				3	X		3			3
Eur 5 R	missing	missing					X	P			P	
Eur 6 L	missing	missing				2	X	MCC	2	CH	P	2
Eur 6 R	missing	missing					X	P			P	
Eur 6 N L	missing	missing				2	X		2	CH		2
Eur 6 N R	missing	missing		SS			X	ACS 3a				
Eur 7 L			2			2	X		2			2
Eur 7 R	T			CH 1			X	CAS 1b		CH		
Eur 8 L	missing	missing				2	X		2		P	2
Eur 8 R	missing	missing					X	P				
Eur 9 L	missing	missing				3	X	P	3	CH	P	3
Eur 9 R	missing	missing					X	P			P	
Eur 10 L	missing	missing				2	X	CH 7b1	2	CH		2
Eur 10 R	missing	missing					X	CH 7c				
Afr 1 L	missing	missing				2	X	P	2	missing	missing	
Afr 1 R	missing	missing		CH 1			X	P		missing	missing	

TABLE FOUR

	Florence D III 56 FESR			Vatican City Inc.S.120 FESR			London C.1.d.1 FESR			Milan AK.XVI.13 FESR		
	backing	map	state	backing	map	state	backing	map	state	backing	map	state
Afr 2 L	missing	missing				3	X	P	3		MCC	3
Afr 2 R	missing	missing					X	P		LA 1b	MCC	
Afr 3 L	T		2			1	X	P	2		P	2
Afr 3 R							X	P		LA 1a	P	
Afr 4 L	missing	missing		SS		2	X	P	2	LA		2
Afr 4 R	missing	missing					X	P			MCC	
Asi 1 L	T		2			2	X	P	2	missing	missing	
Asi 1 R		P					X	P		missing	missing	
Asi 2 L	missing	missing		CE		2?	X	P	2	CH	MCC	2
Asi 2 R	missing	missing					X	P			MCC	
Asi 3 L		MCC	3			3	X	P	3		MCC	3
Asi 3 R	T						X	P		CH	MCC	
Asi 4 L	missing	missing				2	X	P	2		P	2
Asi 4 R	missing	missing					X	P			P	
Asi 4 N L	missing	missing		SS		1	X		1	CH 9	MCC	1
Asi 4 N R	missing	missing					X	LACS			MCC	
Asi 5 L	missing	missing				2	X	CH 1d	1	CH 9	P	2
Asi 5 R	missing	missing					X				P	
Asi 6 L	missing	missing				2	X	P	2	CH 9	P	2
Asi 6 R	missing	missing		SS			X	MCC				
Asi 7 L	missing	missing			P	L 2 R 3	X	MCC	2	CH 9		2
Asi 7 R	missing	missing		CE	P		X	P			P	
Asi 8	missing	missing		CH		2	X	P	2		MCC	2
Asi 9	missing	missing				2	X	P	2	CE 3	P	2
Asi 10 L	missing	missing		CE	P	2	X	P	2	missing	missing	
Asi 10 R	missing	missing					X	P		missing	missing	
Asi 11 L	missing	missing				1	X	MCC	1	missing	missing	
Ais 11 R	missing	missing		CE			X	SS		missing	missing	
Asi 12 L	missing	missing				3	X	CAS 1a	3	missing	missing	
Asi 12 R	missing	missing					X			missing	missing	

TABLE FOUR

	Milan AK.XVI.12 SEFR			Rome 70.1.G.7 SEFR			Rome 70.1.G.10 SEFR			Vatican City Stamp.Ross.301 SESR		
	backing	map	state	backing	map	state	backing	map	state	backing	map	state
World L	X	HS 1a	2	X	HS 1b	2	X		2	missing	missing	
World R	X	HS 1a		X	HS 1a		X	HS 1		missing	missing	
Eur 1 L	X	ACS 2	2	X		2	X		2	X	CRECC	2
Eur 1 R	X			X	ACS 2a		X	ACS 2b		X		
Eur 2 L	X		2	missing	missing		X		2	X		2
Eur 2 R	X	ACS 2		missing	missing		X	ACS 2		X	CRECC	
Eur 2 N L	X		2	missing	missing		X		2	X		2
Eur 2 N R	X	ACS 2b		missing	missing		X	ACS 2		X	CRECC	
Eur 3 L	X		2	X	ACS 2a	2	X		2	X	CRECC	2
Eur 3 R	X	ACS 2a		X			X	ACS 2a		X		
Eur 3 N L	X	ACS 2b	2	X		2	X	ACS 2a	2	X		2
Eur 3 N R	X			X	ACS 2b		X			X	CRECC	
Eur 4 L	X	ACS 2b	2	X	ACS 2a	2	X		2	X		2
Eur 4 R	X			X			X	ACS 2b		X	CRECC	
Eur 5 L	X		3	X		3	X		3	X		3
Eur 5 R	X	ACS 2b		X	ACS 2		X	ACS 2b		X	CRECC	
Eur 6 L	X	ACS 2b	2	X		2	X	ACS 2	2	X		2
Eur 6 R	X			X	CRECC 1c		X			X	CRECC	
Eur 6 N L	X	ACS 2	2	X	ACS 2	2	X	ACS 2	2	X	CRECC	2
Eur 6 N R	X			X			X			X		
Eur 7 L	X		2	X		2	X		2	X		2
Eur 7 R	X	ACS 2a		X	ACS 2a		X	ACS 2b		X	CRECC	
Eur 8 L	X	ACS 2b	2	X	ACS 2a	2	X		2	X		2
Eur 8 R	X			X			X	ACS 2a		X	CRECC	
Eur 9 L	X	ACS 2b	3	X		3	X		3	X		3
Eur 9 R	X			X	ACS 2		X	ACS 2a		X	CRECC	
Eur 10 L	X	ACS 2	2	X		2	X		2	X	CRECC	2
Eur 10 R	X			X	ACS 2		X	ACS 2		X		
Afr 1 L	X		2	X	ACS 2a	2	X	ACS 2a	2	X	CRECC	2
Afr 1 R	X	ACS 2b		X			X			X		

TABLE FOUR

	Milan AK.XVI.12 SEFR			Rome 70.1.G.7 SEFR			Rome 70.1.G.10 SEFR			Vatican City Stamp.Ross.301 SESR		
	backing	map	state	backing	map	state	backing	map	state	backing	map	state
Afr 2 L	X	ACS 2b	3	X		3	X		3	X		3
Afr 2 R	X			X	ACS 2a		X	ACS 2a		X	CRECC	
Afr 3 L	X	ACS 2a	2	X		2	X		2	X		2
Afr 3 R	X			X	ACS 2		X	ACS 2		X	CRECC	
Afr 4 L	X		2	X	ACS 2a	2	X	ACS 2a	2	X		2
Afr 4 R	X	ACS 2		X			X			X	CRECC	
Asi 1 L	X		2	X		2	X		2	X		2
Asi 1 R	X	ACS 2		X	ACS 2		X	ACS 2b		X	CRECC	
Asi 2 L	X		2	X	ACS 2	2	X		2	X		2?
Asi 2 R	X	ACS 2a		X			X	ACS 2a		X	CRECC	
Asi 3 L	X	ACS 2b	3	X	ACS 2a	3	X	ACS 2a	3	X	CRECC	3
Asi 3 R	X			X			X			X		
Asi 4 L	X	ACS 2	2	X	ACS 2	2	X	ACS 2	2	X		2
Asi 4 R	X			X			X			X	CRECC	
Asi 4 N L	X	ACS 2b	1	X	ACS 2	1	X	ACS 2a	1	X	CRECC	1
Asi 4 N R	X			X			X			X		
Asi 5 L	X		2	X	ACS 2b	2	X		2	X	CRECC	2
Asi 5 R	X	ACS 2a		X			X	ACS 2a		X		
Asi 6 L	X	ACS 2a	2	X		2	X	ACS 2b	2	X		2
Asi 6 R	X			X	ACS 2b		X			X	CRECC	
Asi 7 L	X	ACS 2b	3	X		3	X		3	X	CRECC	3
Asi 7 R	X			X	ACS 2a		X	ACS 2a		X		
Asi 8	X	HS 1b	2	X	HS 1b	2	X	HS 1a	2	X	NOW	2
Asi 9	X	HS 1b	2	X	HS 1b	2	X	HS 1b	2	X	CRECC	2
Asi 10 L	X		2	X		2	X		2	X		2
Asi 10 R	X	ACS 2a		X	ACS 2b		X	ACS 2b		X	ACS 3	
Asi 11 L	X		1	X	ACS 2	1	X	ACS 2b	1	X	CRECC	1
Ais 11 R	X	ACS 2b		X			X			X		
Asi 12 L	X	NOW	3	X		3	X		3	X	CRECC	3
Asi 12 R	X			X	ACS 2a		X	ACS 2b		X		

TABLE FOUR

	London CA15F-002 SESR			Rome 51.G.1 SESR			London C.3.d.10 SESR			Milan Inc.422bis SESR		
	backing	map	state	backing	map	state	backing	map	state	backing	map	state
World L	missing	missing		LACS?		2	X	CRECC	2	X	CREC	2
World R	missing	missing					X			X		
Eur 1 L	X		2			2	X	CRECC 1a	2	X		2
Eur 1 R	X				CREC		X			X	CRECC	
Eur 2 L	X		2			2	X		2	X		2
Eur 2 R	X	CREC					X	CRECC		X	CREC	
Eur 2 N L	missing	missing				2	X	CRECC 1b	2	X		2
Eur 2 N R	missing	missing			CRECC		X			X	CRECC	
Eur 3 L	X	CREC	2		CREC	2	X	CRECC 1b	2	X		2
Eur 3 R	X						X			X	CRECC	
Eur 3 N L	missing	missing				2	X	CRECC 1b	2	X		2
Eur 3 N R	missing	missing			CRECC		X			X	CRECC	
Eur 4 L	X	CREC	2		CRECC	2	X	CRECC 1b	2	X	CREC	2
Eur 4 R	X						X			X		
Eur 5 L	missing	missing				3	X	CRECC 1c	3	X	CRECC	3
Eur 5 R	missing	missing			CRECC		X			X		
Eur 6 L	X	CREC	2		CRECC	2	X	CRECC 1a	2	X	ACS	2
Eur 6 R	missing	missing					X			X		
Eur 6 N L	X	CRECC	2			2	X	CRECC	2	X		2
Eur 6 N R	X				CRECC		X			X	CRECC	
Eur 7 L	missing	missing	2			2	X		2	X		2
Eur 7 R	X	CRECC			CRECC		X	CRECC 1d		X	ACS?	
Eur 8 L	X	CRECC	2			2	X		2	X	CRECC	2
Eur 8 R	X				CREC		X	CRECC 1c		X		
Eur 9 L	X		3			3	X	CRECC 1d	3	X	CREC	3
Eur 9 R	X	CRECC			CREC		X			X		
Eur 10 L	X	CRECC	2			2	X	CRECC	2	X	CRECC	2
Eur 10 R	X			LACS?	CREC		X			X		
Afr 1 L	X	CRECC	2			2	X		2	X		2
Afr 1 R	X				CRECC		X	CRECC		X	CRECC	

TABLE FOUR

	London CA15F-002 SESR			Rome 51.G.1 SESR			London C.3.d.10 SESR			Milan Inc.422bis SESR		
	backing	map	state	backing	map	state	backing	map	state	backing	map	state
Afr 2 L	X		3			3	X	CRECC	3	X	CRECC	3
Afr 2 R	X	CRECC					X			X		
Afr 3 L	X		2			2	X		2	X	CRECC	2
Afr 3 R	X	CRECC			CREC		X	CRECC		X		
Afr 4 L	X	CRECC	2			2	X		2	X		2
Afr 4 R	X						X	CRECC		X	CRECC	
Asi 1 L	X		2	LACS?	CREC	2	X		2	X	CREC	2
Asi 1 R	X	CRECC					X	CRECC		X		
Asi 2 L	X		2?			2 or 3?	X	CRECC	2 or 3	X		3?
Asi 2 R	X	CRECC			CRECC		X			X	CRECC	
Asi 3 L	X		3			3	X	CRECC 1d	3	X		3
Asi 3 R	X	CRECC			CRECC		X			X	CRECC	
Asi 4 L	X	CREC	2			2	X	CRECC 1a	2	X	CRECC	2
Asi 4 R	X						X			X		
Asi 4 N L	missing	missing				1	X		1	X		1
Asi 4 N R	missing	missing			CREC		X	CRECC 1b		X	CRECC	
Asi 5 L	X	CRECC	2	LACS?		2	X	CRECC 1a	2	X		2
Asi 5 R	X						X			X	CRECC	
Asi 6 L	X		2			2	X		2	X	CREC	2
Asi 6 R	X	CRECC 1b					X	CRECC 1b		X		
Asi 7 L	X		3			3	X		3	X	CRECC	3
Asi 7 R	X	CRECC					X	CRECC		X		
Asi 8	X	NOW	2			2	X	CRECC	2	X	NOW	2
Asi 9	X	CREC	2		NOW	2	X	NOW	2	X	CREC	2
Asi 10 L	missing	missing				2	X		2	X	CRECC	2
Asi 10 R	missing	missing			CREC		X	CRECC 1b		X		
Asi 11 L	missing	missing				1	X	CRECC	1	X		1
Ais 11 R	missing	missing			CREC		X			X	CREC	
Asi 12 L	missing	missing				3	missing	missing		X		3
Asi 12 R	missing	missing		LACS?	CREC		missing	missing		X	CRECC	

TABLE FOUR

	London 163.b.1 SESR			Brussels Inc C 208 SETR			London G.8173 SETR			London Crouch 12890 SETR		
	backing	map	state	backing	map	state	backing	map	state	backing	map	state
World L	X	CRECC 1b	2	X	B	2	X	CREC	2	X	B	2
World R	X			X			X			X		
Eur 1 L	X	CRECC 1b	2	X		2	X	CAS	2	X	CAS	2
Eur 1 R	X			X	B		X			X		
Eur 2 L	X	CRECC 1c	2	X	B	2	X		2	X	ACS	2
Eur 2 R	X			X			X	CRECC		X		
Eur 2 N L	X	CREC	2	X	P	2	X		2	X		2
Eur 2 N R	X			X			X	LASS 1c		X	AHC	
Eur 3 L	X	CRECC 1b	2	X	B 1a	2	X	CREC	2	X		2
Eur 3 R	X			X			X			X	CAS	
Eur 3 N L	X	CREC	2	X		2	X		2	X	ACS	2
Eur 3 N R	X			X	CREC		X	CRECC 1b		X		
Eur 4 L	X	CREC	2	X		2	X	CREC	2	X		2
Eur 4 R	X			X	ACS 3b		X			X	ACS 3b	
Eur 5 L	X		3	X		3	X		3	X		3
Eur 5 R	X	CRECC 1b		X	P		X	CRECC 1b		X	ACS 3a	
Eur 6 L	X		2	X		2	X		2	X		2
Eur 6 R	X	CREC		X	CAS		X	CRECC 1b		X	CACS	
Eur 6 N L	X	CREC	2	X		2	X	CRECC	2	X	ACS	2
Eur 6 N R	X			X	CAS 1c		X			X		
Eur 7 L	X		2	X	CAS 1b	2	X		2	X		2
Eur 7 R	X	CRECC 1d		X			X	CRECC 1d		X	ACS 3b	
Eur 8 L	X	CRECC 1c	2	X	CREC	2	X		2	X	CROCL 1a	2
Eur 8 R	X			X			X	ACS 3a		X		
Eur 9 L	X	CREC	3	X		3	X		3	X	CAS	3
Eur 9 R	X			X	B		X	CAS 1c		X		
Eur 10 L	X		2	X		2	X		2	X	ACS	2
Eur 10 R	X	CREC		X	P		X	CAS 1b		X		
Afr 1 L	X	CRECC 1b	2	X		2	X	CAS 1c	2	X		2
Afr 1 R	X			X	B		X			X	CAS	

TABLE FOUR

	London 163.b.1 SESR			Brussels Inc C 208 SETR			London G.8173 SETR			London Crouch 12890 SETR		
	backing	map	state	backing	map	state	backing	map	state	backing	map	state
Afr 2 L	X		3	X	ACS 3a	3	X	CROCL 1b	3	X	ACS	3
Afr 2 R	X	CRECC		X			X			X		
Afr 3 L	X		2	X		2	X		2	X		2
Afr 3 R	X	CRECC		X	CRECC		X	CRECC 1a		X	CROCL 1a	
Afr 4 L	X		2	X	ACS 3a	2	X		2	X	ACS	2
Afr 4 R	X	CRECC		X			X	ACS		X		
Asi 1 L	X		2	X		2	X		2	X	CROCL	2
Asi 1 R	X	CRECC 1b		X	CROCL 1c		X	CAS		X		
Asi 2 L	X	CRECC 1b	3	X	CROCL 1c	3	X		3	X	ACS 3a	3
Asi 2 R	X			X			X	CRECC 1a		X		
Asi 3 L	X		3	X	ACS 2a	3	X	CROCL 1c	3	X		3
Asi 3 R	X	CRECC 1b		X			X			X	ACS	
Asi 4 L	X		2	X	CROCL 1a	2	X		2	X	CAS	2
Asi 4 R	X	CRECC 1b		X			X	CREC		X		
Asi 4 N L	X		1	X	CAS 1c	1	X		1	X	ACS	1
Asi 4 N R	X	CRECC 1b		X			X	ACS 3a		X		
Asi 5 L	X	CRECC 1a	2	X	LASS 1b	2	X	CROCL 1a	2	X		2
Asi 5 R	X			X			X			X	CAS	
Asi 6 L	X		2	X	AHC 1d	2	X	CH 1d	2	X	B	2
Asi 6 R	X	CRECC 1b		X			X			X		
Asi 7 L	X		3	X		3	X		3	X		3
Asi 7 R	X	ACS 2b		X	ACS 3b		X	CROCL 1a		X	CROCL 1c	
Asi 8	X	NOW	2	X	B 1a	2	X	NOW	2	X	B	2
Asi 9	X	CREC	2	X	NOW	2	X	CRECC 1b	2	X	NOW	2
Asi 10 L	X	CRECC 1b	2	X		2	X	CRECC 1a	2	X	ACS	2
Asi 10 R	X			X	ACS 3a		X			X		
Asi 11 L	X	CREC	1	X		1	CH	CH 1c	1	X		1
Asi 11 R	X			X	ACS 3b					X	ACS 3a	
Asi 12 L	X		3	X	CAS 1a	3	?	CH 7c	3	X	CAS	3
Asi 12 R	X	CREC		X			?			X		

TABLE FOUR

	Turin XV.I.41 SETR			Milan AM.XV.36 SETR			London CA15F-001 SETR			Milan Inc.422 SETR		
	backing	map	state	backing	map	state	backing	map	state	backing	map	state
World L	X	AHC 1a	2	X		2	?		1	X	CAS	2
World R	X			X	B		?	CH		X		
Eur 1 L	X	AHC 1a	2	X		2	X		2	X		2
Eur 1 R	X			X	CAS 1c		X	AHC		X	B	
Eur 2 L	X		2	X	CAS 1c	2	X		2	X	AHC	2
Eur 2 R	X	AHC		X			X	LASS 1d		X		
Eur 2 N L	X		2	X	ACS 3b	2	X	AHC	2	X	LACS	2
Eur 2 N R	X	AHC 1b		X			X			X		
Eur 3 L	X	CACS	2	X		2	X		2	X		2
Eur 3 R	X			X	B 1a		X	CRECC		X	CRECC	
Eur 3 N L	X		2	X	ACS 3b	2	X		2	X	LASS	2
Eur 3 N R	X	AHC 1b		X			X	AHC		X		
Eur 4 L	X	AHC 1a	2	X		2	X		2	X	LACS	2
Eur 4 R	X			X	ACS 3b		X	AHC		X		
Eur 5 L	X		3	X		3	X	CACS	3	X		3
Eur 5 R	X	CRECC		X	B		X			X	CAS	
Eur 6 L	X	CRECC 1d	2	X	CAS 1a	2	CH 1d	CH	1	X	CAS	2
Eur 6 R	X			X						X		
Eur 6 N L	X		2	X		2	X		2	X	CAS	2
Eur 6 N R	X	AHC 1b		X	ACS 3a		X	AHC 1b		X		
Eur 7 L	X	CACS	2	X	B 1a	2	X	EC	2	X	B	2
Eur 7 R	X			X			X			X		
Eur 8 L	X		2	X	ACS 3a	2	X	AHC	2	X	LACS	2
Eur 8 R	X	CACS		X			X			X		
Eur 9 L	X		3	X		3	X		3	X	CAS	3
Eur 9 R	X	AHC 1a		X	CAS 1c		X	AHC		X		
Eur 10 L	X		2	X	CAS 1a	2	X		2	X	AHC	2
Eur 10 R	X	AHC 1b		X			X	AHC		X		
Afr 1 L	X	CACS	2	X	CAS 1c	2	X	CRECC	2	X		2
Afr 1 R	X			X			X			X	CAS	

TABLE FOUR

	Turin XV.I.41 SETR			Milan AM.XV.36 SETR			London CA15F-001 SETR			Milan Inc.422 SETR		
	backing	map	state	backing	map	state	backing	map	state	backing	map	state
Afr 2 L	X	CRECC 1c	3	X		3	X		3	X	LACS	3
Afr 2 R	X			X	ACS 3b		X	CRECC		X		
Afr 3 L	X		2	X	ACS 3b	2	X		2	X		2
Afr 3 R	X	CACS		X			X	CACS		X	LASS	
Afr 4 L	X		2	X	ACS 3b	2	X		2	X		2
Afr 4 R	X	AHC		X			X	AHC		X	LACS	
Asi 1 L	X	AHC	2	X		2	X		2	X		2
Asi 1 R	X			X	B		X	AHC		X	B	
Asi 2 L	X	AHC 1b	3	X	ACS 3a	3	X	AHC	3	X	LASS	3
Asi 2 R	X			X			X			X		
Asi 3 L	X	CACS	3	X	ACS 3a	3	X	CACS	3	X		3
Asi 3 R	X			X			X			X	LASS	
Asi 4 L	X	AHC 1a	2	X	CAS 1a	2	X		2	X	CAS	2
Asi 4 R	X			X			X	AHC		X		
Asi 4 N L	X		1	X	ACS 3b	1	X	AHC	1	X		1
Asi 4 N R	X	AHC 1b		X			X			X	CRECC	
Asi 5 L	X		2	X	CAS 1c	2	X	LASS	2	X		2
Asi 5 R	X	ACS		X			X			X	B	
Asi 6 L	X		2	X		2	X	B	2	X	B	2
Asi 6 R	X	AHC		X	B		X			X		
Asi 7 L	X	CRECC 1d	3	X		3	X		3	X	LACS	3
Asi 7 R	X			X	ACS 3b		X	CRECC		X		
Asi 8	X	NOW	2	X	LASS 1b	2	X	CRECC	2	X	NOW	2
Asi 9	X	AHC 1a	2	X	NOW	2	X	NOW	2	X	LASS	2
Asi 10 L	X	AHC	2	X		2	?	?	2	X	ACS	2
Asi 10 R	X			X	ACS 3a		?	?		X		
Asi 11 L	X		1	X	ACS 3b	1	?	?	1	X		1
Ais 11 R	X	CACS		X			?	?		X	ACS	
Asi 12 L	X		3	X	B 1b	3	?	?	3	X		3
Asi 12 R	X	CRECC 1c		X			?	?		X	CAS	

TABLE FOUR

	Florence Palat D.7.1.5 SETR			Vatican City Stamp.Barb.AAA.IV.15 SETR		
	backing	map	state	backing	map	state
World L	X		2	missing	missing	
World R	X	CAS		missing	missing	
Eur 1 L	X	B	2	X	B	2
Eur 1 R	X			X		
Eur 2 L	X		2	X		2
Eur 2 R	X	AHC 1a		X	LASS	
Eur 2 N L	X	LACS	2	X	LACS	2
Eur 2 N R	X			X		
Eur 3 L	X		2	X		2
Eur 3 R	X	B		X	B	
Eur 3 N L	X	LACS	2	X		2
Eur 3 N R	X			X	LASS	
Eur 4 L	X		2	X	LACS	2
Eur 4 R	X	LACS		X		
Eur 5 L	X		3	X	B	3
Eur 5 R	X	EC		X		
Eur 6 L	X	CROC	2	X		2
Eur 6 R	X			X	LACS	
Eur 6 N L	X		2	X	CAS	2
Eur 6 N R	X	LACS		X		
Eur 7 L	X	CACS	2	X		2
Eur 7 R	X			X	B	
Eur 8 L	X		2	X	LACS	2
Eur 8 R	X	LACS		X		
Eur 9 L	X		3	X		3
Eur 9 R	X	CAS		X	B	
Eur 10 L	X	CAS	2	X		2
Eur 10 R	X			X	CAS	
Afr 1 L	X		2	X	LASS	2
Afr 1 R	X	AHC 1c		X		

TABLE FOUR

	Florence Palat D.7.1.5 SETR			Vatican City Stamp.Barb.AAA.IV.15 SETR		
	backing	map	state	backing	map	state
Afr 2 L	X		3	X		3
Afr 2 R	X	LACS		X	LACS	
Afr 3 L	X		2	?	?	2
Afr 3 R	X	LASS 1a		?		
Afr 4 L	X		2	X		2
Afr 4 R	X	LACS		X	LACS	
Asi 1 L	X		2	X		2
Asi 1 R	X	AHC		X	B	
Asi 2 L	X		3	X		3?
Asi 2 R	X	LACS		X	LACS	
Asi 3 L	X	CRECC	3	X		3
Asi 3 R	X			X	LASS	
Asi 4 L	X	LASS 1d	2	X		2
Asi 4 R	X			X	LASS	
Asi 4 N L	X	LASS	1	missing	missing	
Asi 4 N R	X			missing	missing	
Asi 5 L	X		2	X	CAS	2
Asi 5 R	X	CRECC		X		
Asi 6 L	X		2	X	B	2
Asi 6 R	X	AHC		X		
Asi 7 L	X	ACS 2b	3	X	LACS	3
Asi 7 R	X			X		
Asi 8	X	NOW	2	X	NOW	2
Asi 9	X	AHC	2	X	LASS	2
Asi 10 L	X		2	X	LASS	2
Asi 10 R	X	AHC		X		
Asi 11 L	X	AHC	1	X	LACS	1
Asi 11 R	X			X		
Asi 12 L	X		3	X	B	3
Asi 12 R	X	CACS		X		

TABLE FIVE

	Barcelona Inc. 47-Fol FEFR?	Florence R.A.788 FESR?	Florence SEDE.Ed.R.624 FESR	Lucca Inc.214 FESR	Venice Inc.0037 FESR	Venice Inc.D.013 FESR	Florence D III 56 FESR	Vatican City Inc.S.120 FESR	Milan AK.XVI.13 FESR
shearer scissors		●						●	●
scissors	●								
crescent with rays and a cross on top	●								
cardinal's hat 1		●						●	
cardinal's hat 5									
cardinal's hat 6			●			●			
cardinal's hat 8		●							
cardinal's hat 9									●
cardinal's hat 10									
lily		●							
lily in a circle 1									
lily in a circle 2									
crown in a circle									
siren									
column									
crossbow in a circle									
crowned eagle								●	●
anchor in a circle									
anchor in a circle with a star on top		●							
crescent				●		●			
crossed keys in a circle				●					
crossed keys in a circle with a cross on top				●					
Greek cross in a circle		●							
ladder									●
tulip							●		
cardinal's hat type?					●				
three mountains in a circle with a cross on top		●	●	●	●	●	●	●	●
P		●	●	●	●	●	●	●	●
cardinal's hat 7		●			●?	●?			

TABLE SIX

	Florence Inc.I.5 FEFR		Turin XV.I.42 FEFR		Rome Inc.541 FEFR		Rome 70.1.G.5 FEFR		Florence Inc. 34 FEFR	
World	CH	1	SS	1	CH	1	CH	1		1
Europe 1		1		1	CH	1	CH	1		1
Europe 2		1	CH	1	CH	1	CH	1		1
Europe 2 N	SS	1		1	CH	1	CH	1		?
Europe 3	SS	1	CH	1	CH	1	CH	1		1
Europe 3 N	CH	1	CH	1	CH	1	CH	2		1
Europe 4	CH	1	CH	1	SS	1	CH	1		1
Europe 5	SS	2		1	CH	1	CH	1		1
Europe 6		1		1	CH	1	CH	1		1
Europe 6 N		1		1	SS	1	CH	1		1
Europe 7		2	CH	2	SS	2	CH	2		2
Europe 8		1	CH	1	CH	1	CH	1		1
Europe 9			CH	1	SS	1	CH	2		1
Europe 10				1	CH	1	CH	1		1
Africa 1		1	CH	1	CH	1	CH	1		1
Africa 2		3	SS	2	SS	2	LIC	3		2
Africa 3	SS CH	1	CH	1	CH	1	CH	1		1
Africa 4		1	CH	1	SS	1	CH	1		1
Asia 1			CH	1	SS	1	CH	1		1
Asia 2		1		1	SS	1	CH	1		1
Asia 3		1	CH	1	CH	1	CH	1		1
Asia 4			CH	1	SS	1	CH	1		1
Asia 5			CH	1	SS	1	CH	1		1
Asia 6				1	CH	1	CH	1		1
Asia 7			CH	1	CH	1	CH	1		1
Asia 8		1		1		1	CH	1		1
Asia 9	CH	1	CH	1	SS	1		1		1
Asia 10			CH	1	CH	1	CH	1		1
Asia 12	SS	1	CH	2	CH	2	CH	2		2

TABLE SIX

	Amsterdam Me 0376 FEFR		Naples S.Q.X.K.15 FEFR	London PBD 7690 FEFR		Rome Vol.Inc.1110 FESR		Giunti
World		1		CH	2	P	2	
Europe 1		1		CROC	2	P	2	
Europe 2	CH	1	1	CH	1	P + MCC	2	
Europe 2 N	CH	1		SS	1	P	2	
Europe 3		1	1			P	2	
Europe 3 N	CH	1		SS	P	CH	2	
Europe 4	CH	1	1	CH	1	P	2	
Europe 5	CH	1	1	SS	2	MCC + P	3	
Europe 6		1		SS	P	P	2	
Europe 6 N	CH	1				P	2	
Europe 7		2		SS	1	P + MCC	2	
Europe 8	CH	1		CH	2	P	2	
Europe 9		2		CH	3	P	3	
Europe 10	CH	1		CH	2	CH 7 2x	2	
Africa 1	CH	1		SS	1	P	2	
Africa 2	CH	3	3	SS	1	P	3	
Africa 3		1		CH	1	P	2	
Africa 4	CH	1		SS	P	MCC + P	2	
Asia 1	CH	1		CH	1	P	2	
Asia 2	CH	1		CH	2	P	2	2 or 3
Asia 3		1	2	CH	3	P	3	
Asia 4	CH	1		CH	2	P	2	
Asia 5	CH	1				CH	2	
Asia 6	CH	1		CH	2	P	2	
Asia 7	CH	1	1	CROC	2	P	2	3
Asia 8	CH	1		CH	2	P	2	
Asia 9		1			2	P	2	
Asia 10	CH	1		SS	2	P	2	
Asia 12	CH	2				P	3	

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- Fig. 714 register and colophon in facsimile, Berlinghieri's *Geography*, © Biblioteca Casanatense, Roma, MiC, shelfmark Vol.Inc.1110

- Fig. 715 original register and colophon, Berlinghieri's *Geography*, © De Koninklijke Bibliotheek van België, shelfmark Inc C 208
- Fig. 716 Berlinghieri's letter to Cem on parchment, Berlinghieri's *Geography*, [Florence, Nicolaus Laurentii, Alamanus, not after 10 Sept. 1482], © Biblioteca Nazionale Universitaria di Torino, shelfmark XV.I.42
- Fig. 717 dedication to Cem on parchment, Berlinghieri's *Geography*, [Florence, Nicolaus Laurentii, Alamanus, not after 10 Sept. 1482], © Biblioteca Nazionale Universitaria di Torino, shelfmark XV.I.42
- Fig. 718 TABVLA VNDECIMA DE ASIA with two watermarks belonging to different printing phases in the left and right half of the map, Berlinghieri's *Geography*, © The British Library Board, shelfmark C.1.d.1
- Fig. 719 frontispiece with motto DA GLORIAM DEO, Berlinghieri's *Geography*, © Biblioteca Universitaria Alessandrina, shelfmark Inc.541
- Fig. 720 colouring and illumination of the world map, CAELESTEM HIC TERRAM INSPICIAS TERRESTRE OB CAELVM, Berlinghieri's *Geography*, © Biblioteca Universitaria Alessandrina, shelfmark Inc.541
- Fig. 721 frontispiece of Cem's copy, Berlinghieri's *Geography*, [Florence, Nicolaus Laurentii, Alamanus, not after 10 Sept. 1482], © Biblioteca Nazionale Universitaria di Torino, shelfmark XV.I.42
- Fig. 722 colouring, illumination and gold heightening of the world map of Cem's copy, CAELESTEM HIC TERRAM INSPICIAS TERRESTRE OB CAELVM, Berlinghieri's *Geography*, [Florence, Nicolaus Laurentii, Alamanus, not after 10 Sept. 1482], © Biblioteca Nazionale Universitaria di Torino, shelfmark XV.I.42
- Fig. 723 handwriting applied in the gazetteer belonging to the map TABVLA DECIMA D ASIA of the Braidense manuscript, Berlinghieri's *Geographia*, © Pinacoteca di Brera - Biblioteca Nazionale Braidense, Milan, shelfmark AC.XIV.44
- Fig. 724 frontispiece of the Braidense manuscript, Berlinghieri's *Geographia*, © Pinacoteca di Brera - Biblioteca Nazionale Braidense, Milan, shelfmark AC.XIV.44
- Fig. 725 traces applied by the copyist, a reminder of where he had paused, the Braidense manuscript, Berlinghieri's *Geographia*, © Pinacoteca di Brera - Biblioteca Nazionale Braidense, Milan, shelfmark AC.XIV.44
- Fig. 726 traces applied by the copyist, a reminder of where he had paused, the Braidense manuscript, Berlinghieri's *Geographia*, © Pinacoteca di Brera - Biblioteca Nazionale Braidense, Milan, shelfmark AC.XIV.44
- Fig. 727 fries with floral motif, first page of Liber Secundus, the Braidense manuscript, Berlinghieri's *Geographia*, © Pinacoteca di Brera - Biblioteca Nazionale Braidense, Milan, shelfmark AC.XIV.44
- Fig. 728 fries with *candelabra*, first page of Liber Septimus, the Braidense manuscript, Berlinghieri's *Geographia*, © Pinacoteca di Brera - Biblioteca Nazionale Braidense, Milan, shelfmark AC.XIV.44
- Fig. 729 the map GALLIA NOVELLA, the Braidense manuscript, Berlinghieri's *Geographia*, © Pinacoteca di Brera - Biblioteca Nazionale Braidense, Milan, shelfmark AC.XIV.44
- Fig. 730 frontispiece of a printed copy, Berlinghieri's *Geography*, © Florence, The Biblioteca Medicea Laurenziana, shelfmark Inc.I.5
- Fig. 731 frontispiece of a printed copy, Berlinghieri's *Geography*, © Biblioteca Nazionale Centrale di Roma, shelfmark 70.1.G.5
- Fig. 732 the map TABVLA SEXTA D EVROPA in a printed copy, Berlinghieri's *Geography*, © Biblioteca Nazionale Centrale di Roma, shelfmark 70.1.G.5
- Fig. 733 the wrongly applied word ERVPA in the title of the map TABVLA QVINTA DE ERVPA in the Braidense manuscript, Berlinghieri's *Geographia*, © Pinacoteca di Brera - Biblioteca Nazionale Braidense, Milan, shelfmark AC.XIV.44
- Fig. 734 world map, CAELESTEM HIC TERRAM INSPICIAS TERRESTRE OB CAELVM, of the Braidense manuscript, Berlinghieri's *Geographia*, © Pinacoteca di Brera - Biblioteca Nazionale Braidense, Milan, shelfmark AC.XIV.44
- Fig. 735 superposition of the printed world map, CAELESTEM HIC TERRAM INSPICIAS TERRESTRE OB CAELVM, and the corresponding one in the Braidense manuscript, Berlinghieri's *Geographia*, © Pinacoteca di Brera - Biblioteca Nazionale Braidense, Milan, shelfmark AC.XIV.44
- Fig. 736 superposition of the printed map TABVLA OCTAVA DE EVROPA and the corresponding one in the Braidense manuscript, Berlinghieri's *Geographia*, © Pinacoteca di Brera - Biblioteca Nazionale Braidense, Milan, shelfmark AC.XIV.44
- Fig. 737 superposition of the printed map TABVLA SECONDA DE ASIA and the corresponding one in the Braidense manuscript, Berlinghieri's *Geographia*, © Pinacoteca di Brera - Biblioteca Nazionale Braidense, Milan, shelfmark AC.XIV.44
- Fig. 738 superposition of the printed map TABVLA TERTIA D ASIA and the corresponding one in the Braidense manuscript, Berlinghieri's *Geographia*, © Pinacoteca di Brera - Biblioteca Nazionale Braidense, Milan, shelfmark AC.XIV.44

- Fig. 739 superposition of the printed map TABVLA QVINTA DE ASIA and the corresponding one in the Braidense manuscript, Berlinghieri's *Geographia*, © Pinacoteca di Brera - Biblioteca Nazionale Braidense, Milan, shelfmark AC.XIV.44
- Fig. 740 superposition of the printed map TABVLA SEPTIMA DE ASIA and the corresponding one in the Braidense manuscript, Berlinghieri's *Geographia*, © Pinacoteca di Brera - Biblioteca Nazionale Braidense, Milan, shelfmark AC.XIV.44
- Fig. 741 superposition of the printed map TABVLA OCTAVA D ASIA and the corresponding one in the Braidense manuscript, Berlinghieri's *Geographia*, © Pinacoteca di Brera - Biblioteca Nazionale Braidense, Milan, shelfmark AC.XIV.44
- Fig. 742 incorrect implementation of rivers from the work template on the map TABVLA DECIMA D ASIA of the Braidense manuscript, Berlinghieri's *Geographia*, © Pinacoteca di Brera - Biblioteca Nazionale Braidense, Milan, shelfmark AC.XIV.44
- Fig. 743 detail of the map TABVLA SEPTIMA DE ASIA of the Braidense manuscript, Berlinghieri's *Geographia*, © Pinacoteca di Brera - Biblioteca Nazionale Braidense, Milan, shelfmark AC.XIV.44
- Fig. 744 detail of the map TABVLA SEPTIMA DE ASIA Berlinghieri's *Geography*, © private collection

ATTACHMENTS

1 Watermarks in printed editions of the *Cosmography* prior to 1500

The following articles, books and websites were consulted to find watermark references.

Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907).

Giancarlo Castagnari, *L'opera dei fratelli Zonghi*, (Cartiere Miliani Fabriano 2003).

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Arthur M. Hind, *Early Italian engraving* (London 1938).

Nikolaj P. Likachev, *Lickachev's watermarks*, (Amsterdam 1994).

Vladimir Mošin, *Anchor Watermarks*, (Hilversum, 1973).

Gerhard Piccard, *Die Wasserzeichenkartei*, vol. I-XVII (Stuttgart 1961-1997).

<https://ccf.fondazionefedrigoni.it/>

<https://www.gravell.org/>

https://manuscripta.at/_scripts/php/wies.php

https://www.memoryofpaper.eu/BernsteinPortal/appl_start.disp

<https://www.wasserzeichen-online.de/wzis/>

<https://www.wzma.at/>

The 1475 *Vicenza Cosmography* edition

bird

Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 3, p. 611, no. 12130. 1475

five-leaf flower

Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 2, p. 366, no. 6365. 1476

simple form of a mountain with three peaks

Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 3, p. 590, no. 11659. 1467-1474

WZMA, reference number AT8500-12449_1 1470-1480

WZMA, reference number AT8500-12449_2 1470-1480

The 1477 *Bologna Cosmography* edition

crown

www.wasserzeichen-online.de, reference number DE5580-2Incca2591_a11491

Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 2, p. 292, no. 4790. 1493

five-leaf flower

www.wasserzeichen-online.de, reference number DE5580-2Incca1178a_XX 1482

Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 2, p. 369, no. 6463. 1484

grapes

Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 4, p. 650, no. 13049. 1465

lily with a crown on top

Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 2, p. 397, no. 7224. 1479

n in a circle

www.wasserzeichen-online.de, reference number DE5580-Rar124_a2 1477

www.wasserzeichen-online.de, reference number DE5580-Rar124_A8 1477

simple form of a mountain with three peaks and a cross on top

www.wasserzeichen-online.de, reference number IT7005-PO-150558 1484

The 1478 Rome *Cosmography* edition

crossbow in a circle

Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 1, p. 52, no. 746. 1469

evangelist Marcus

Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 3, p. 539, no. 10474. 1482

The 1482 Ulm *Cosmography* edition

seven-leaf flower

WZIS, reference number DE8100-IncFol8476_999g 1482

WZIS, reference number DE8100-IncFol13539_999 1482

WZIS, reference number DE8100-IncFol13539_999a 1482

WZIS, reference number DE8100-IncFol13539_999b 1482

The 1482 Florence *Geography*

The watermarks in the text pages

cardinal's hat

CH

type 1a no reference found

type 1b

Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 1, p. 224, no. 3393. 1503-1507

type 1c

Bernstein, reference number CCI icpl.cci.XIV.o68.a 1401-1500

WZIS, reference number DE4860-Ms1206_132 1451-1500

WZIS, reference number DE8100-PO-31975 1465

WZIS, reference number DE8100-PO-31972 1471

type 1d

WZIS, reference number DE4860-Ms1206_112 1451-1500

Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 1, p. 224, no. 3387. 1464-1476

type 2

Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 1, p. 224, no. 3388. 1475-1480

type 3 no reference found

type 4

Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 1, p. 224, no. 3390. 1487-1490

crowned eagle

CE

type 1a

Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 1, p. 24, no. 92. 1472-1509

Corpus Chartarum Fabriano, reference number Z01231

1483

Corpus Chartarum Fabriano, reference number Z01232

1483

Corpus Chartarum Fabriano, reference number Z01251

1486

ox

O

WZIS, reference number DE5580-Codgraec258_136

1500-1550

shearer scissors

SS

WZIS, reference number DE5580-Codgraec71_VIII

about 1480

Corpus Chartarum Fabriano, reference number Z01234

1483

Corpus Chartarum Fabriano, reference number Z01235

1483

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cardinal's hat

CH

type 3 no reference found

type 4

Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 1, p. 224, no. 3390. 1487-1490

The watermarks in the fly leaves

cardinal's hat

CH

type 6

WZIS, reference number IT5235-PO-32312

1491

Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 1, p. 224, no. 3391. 1491-1502

shearer scissors

SS

WZIS, reference number DE5580-Codgraec71_VIII

about 1480

Corpus Chartarum Fabriano, reference number Z01234

1483

Corpus Chartarum Fabriano, reference number Z01235

1483

The watermarks in the interleaves placed by Tedesco

cardinal's hat

CH

type 1a no reference found

type 1b

Charles M. Briquet, *Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600*, 4 vols. (Paris 1907), vol. 1, p. 224, no. 3393. 1503-1507

type 1c

Bernstein, reference number CCI icpl.cci.XIV.068.a

1401-1500

WZIS, reference number DE4860-Ms1206_132	1451-1500
WZIS, reference number DE8100-PO-31975	1465
WZIS, reference number DE8100-PO-31972	1471
type 1d	
WZIS, reference number DE4860-Ms1206_112	1451-1500
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 1, p. 224, no. 3387.	1464-1476
type 2	
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 1, p. 224, no. 3388.	1475-1480
type 4	
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 1, p. 224, no. 3390.	1487-1490
type 6	
WZIS, reference number IT5235-PO-32312	1491
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 1, p. 224, no. 3391.	1491-1502
crowned eagle	CE
type 1b	
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 1, p. 24, no. 92.	1472-1509
Corpus Chartarum Fabriano, reference number Z01231	1483
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comet	COM
no reference found	
crossbow in a circle	CROC
type 3	
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 1, p. 52, no. 746.	1469-1503
WZIS, reference number DE8100-PO-123836 Piccard online.	1471
WZIS, reference number DE8100-PO-123837 Piccard online.	1471
Bernstein, CCI, reference number icpl.cci.XXVII.021.a	1468
Gerhard Piccard, <i>Wasserzeichen Werkzeug und Waffen</i> (Stuttgart 1980), no. 2234.	1468
Armbrust 22.	1471-1472
crown in a circle	CROWC
Corpus Chartarum Fabriano, reference number Z01131	1472
Nikolai Petrovich Likhachev, <i>Likhachev's Watermarks</i> (Amsterdam 1994), nr. 401.	1476
Corpus Chartarum Fabriano, reference number Z01166	1477
Corpus Chartarum Fabriano, reference number Z01167	1477
Corpus Chartarum Fabriano, reference number Z01278	1487
lily in a circle	LIC
type 1 and 2	
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 2, p. 400, no. 7312.	1479-1482
Corpus Chartarum Fabriano, reference number Z01290	1488
Gerhard Piccard, <i>Wasserzeichen Lilie</i> (Stuttgart 1983), no. 945.	1489
Corpus Chartarum Fabriano, reference number Z01315	1490

Gerhard Piccard, <i>Wasserzeichen Lilie</i> (Stuttgart 1983), no. 946.	1492
WZIS, reference number IT1650-PO-128715	1494
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First printing phase	
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type 1c	
WZIS, reference number DE4860-Ms1206_132	1451-1500
WZIS, reference number DE8100-PO-31975	1465
WZIS, reference number DE8100-PO-31972	1471
type 1d	
WZIS, reference number DE4860-Ms1206_112	1451-1500
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 1, p. 224, no. 3387.	1464-1476
type 5 no reference found	
type 6	
WZIS, reference number IT5235-PO-32312	1491
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 1, p. 224, no. 3391.	1491-1502
type 8 no reference found	
crossbow in a circle	CROC
type 1, 2	
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 1, p. 52, no. 746.	1469-1503
WZIS, reference number DE8100-PO-123836 Piccard online.	1471
WZIS, reference number DE8100-PO-123837 Piccard online.	1471
Bernstein, CCI, reference number icpl.cci.XXVII.021.a	1468
Gerhard Piccard, <i>Wasserzeichen Werkzeug und Waffen</i> (Stuttgart 1980), no. 2234.	1468
Dieter Harlfinger, Johanna Harlfinger, <i>Wasserzeichen aus Griechischen Handschriften</i> (Berlin 1974), Armbrust 22.	1471-1472
lily	LI
Bernstein, reference number 17387, WZMA, reference number AT4000-220_15	1460-1480
lily in a circle	LIC
type 1	
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 2, p. 400, no. 7312.	1479-1482
Corpus Chartarum Fabriano, reference number Z01290	1488
Gerhard Piccard, <i>Wasserzeichen Lilie</i> (Stuttgart 1983), no. 945.	1489
Corpus Chartarum Fabriano, reference number Z01315	1490
no. 946.	1492
WZIS, reference number IT1650-PO-128715	1494
shearer scissors	SS
WZIS, reference number DE5580-Codgraec71_VIII	about 1480
Corpus Chartarum Fabriano, reference number Z01234	1483
Corpus Chartarum Fabriano, reference number Z01235	1483
The watermarks in the second type of maps printed by Tedescho	

Second printing phase

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type 7	
WZIS, reference number DE0960-Mtlf550_33	1451-1500
WZIS, reference number IT5235-PO-31970	1460
Bernstein, reference number CCI 58_3	1475
WZIS, reference number IT1650-PO-31969	1482
P	P
WZIS, reference number IT2670-PO-106411 Piccard online.	1475
Bernstein, reference number ES-VLC-BH_INC.120_315_bis	1491
three mountains in a circle with a cross on top	MCC
WZIS, reference number IT5235-PO-153390, Gerhard Piccard, <i>Wasserzeichen Dreiberg</i> (Stuttgart 1996), no. 1259.	1488
The watermarks in the third type of maps printed by Giunti	
anchor in a circle with a star on top	ACS
type 2a	
Bernstein, reference number 14922, WZMA AT5000-GB56_1_398	1501-1525
type 2b	
Bernstein, reference number 14921, WZMA AT5000-GB56_1_391	1501-1525
type 3	
no reference found	
anvil with a hammer in a circle	AHC
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 2, p. 347, no. 5963.	1514-1535
WZIS, reference number DE5580-Codgraec91_322	around 1520
boat	B
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 3, p. 601, no. 11963.	1541-1543
crescent with a cross on top	CREC
no reference found	
crescent in a circle with a cross on top	CRECC
no reference found	
crossbow in a circle	CROC
no reference found	
crossbow in a circle with a lily on top	CROCL
WZIS, reference number DE5580-Musm1503aAltus_2	1501-1550
WZIS, reference number DE5580-Musms65_2	1510-1530
crossed arrows in a circle with a star on top	CACS
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 2, p. 362, no. 6305.	1524-1530

crossed arrows with a star on top	CAS
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 2, p. 362, no. 6292.	1509-1510
WZIS, reference number DE5580-Codgraec243_48	1509-1540
WZIS, reference number DE5580-Musms7_22	1511-1533
eagle in a circle	EC
no reference found	
hand with a star on top	HS
no reference found	
ladder in a circle with a star on top	LACS
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 2, p. 345, no. 5922.	1495-1524
ladder in a shield with a star on top	LASS
WZIS, reference number DE8100-HBII2_999	1525-1533
WZIS, reference number DE4620-PO-122767	1531
WZIS, reference number AT8100-PO-122766	1533
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 2, p. 345, no. 5926.	1524-1571
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 2, p. 345, no. 5927.	1525-1559
The watermarks in the backing paper of the maps	
anchor in a circle	AC
no reference found	
anchor in a circle with a star on top	ACS
type 1 no reference found	
cardinal's hat	CH
type 1c	
WZIS, reference number DE4860-Ms1206_132	1451-1500
WZIS, reference number DE8100-PO-31975	1465
WZIS, reference number DE8100-PO-31972	1471
type 1d	
WZIS, reference number DE4860-Ms1206_112	1451-1500
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 1, p. 224, no. 3387.	1464-1476
type 5 no reference found	
type 6	
WZIS, reference number IT5235-PO-32312	1491
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 1, p. 224, no. 3391.	1491-1502
type 8 no reference found	
type 9 no reference found	
type 10 no reference found	
column	COL
Corpus Chartarum Fabriano, reference number Z01096	1469
Corpus Chartarum Fabriano, reference number Z01098	1469

WZIS, reference number DE8100-PO-100191, Gerhard Piccard, <i>Die Turmwasserzeichen</i> (Stuttgart 1970), no. 245.	1471
Dieter Harlfinger, Johanna Harlfinger, <i>Wasserzeichen aus Griechischen Handschriften</i> (Berlin 1974), Säule 21.	1471
crescent	CRE
WZIS, reference number DE8100-PO-41373 Piccard online.	1483
WZIS, reference number DE8100-PO-41374 Piccard online.	1483
crescent with rays and a cross on top	CRERC
WZIS, reference number DE5580-2Incca609_X	1477
crossed keys in a circle	CKC
no reference found	
crossed keys in a circle with a cross on top	CKCC
no reference found	
crowned eagle	CE
type 2 and 3	
Corpus Chartarum Fabriano, reference number Z01148	1475
Corpus Chartarum Fabriano, reference number Z01241	1484
Corpus Chartarum Fabriano, reference number Z01245	1485
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 1, p. 24, no. 82.	1479
WIES, reference number IBE 2527.06	1482
Gravell, reference number 4555	1487-1509
Dieter Harlfinger, Johanna Harlfinger, <i>Wasserzeichen aus Griechischen Handschriften</i> (Berlin 1974), Adler 21.	1495
crown in a circle	CROWC
Corpus Chartarum Fabriano, reference number Z01131	1472
Nikolai Petrovich Likhachev, <i>Likhachev's Watermarks</i> (Amsterdam 1994), nr. 401.	1476
Corpus Chartarum Fabriano, reference number Z01166	1477
Corpus Chartarum Fabriano, reference number Z01167	1477
Corpus Chartarum Fabriano, reference number Z01278	1487
Greek cross in a circle	GCC
WZIS, reference number IT6780-PO-125776, Gerhard Piccard, <i>Wasserzeichen Kreuz</i> (Stuttgart 1981), no. 986.	1483
ladder	LA
Corpus Chartarum Fabriano, reference number Z01236	1483
Corpus Chartarum Fabriano, reference number Z01237	1483
lily	LI
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 2, p. 385, no. 6882.	1473
lily in a circle	LIC
type 1 and 2	
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 2, p. 400, no. 7312.	1479-1482

Corpus Chartarum Fabriano, reference number Z01290	1488
Gerhard Piccard, <i>Wasserzeichen Lilie</i> (Stuttgart 1983), no. 945.	1489
Corpus Chartarum Fabriano, reference number Z01315	1490
Gerhard Piccard, <i>Wasserzeichen Lilie</i> (Stuttgart 1983), no. 946.	1492
WZIS, reference number IT1650-PO-128715	1494
scissors	S
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 2, p. 237, no. 3677.	1477-1498
WZIS, reference number DE8100-PO-122406, Gerhard Piccard, <i>Werkzeug und Waffen</i> (Stuttgart 1980), no. 1314.	1471
Corpus Chartarum Fabriano, reference number Z01217	1481
shearer scissors	SS
WZIS, reference number DE5580-Codgraec71_VIII	about 1480
Corpus Chartarum Fabriano, reference number Z01234	1483
Corpus Chartarum Fabriano, reference number Z01235	1483
siren	SI
no reference found	
tulip	T
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 2, p. 377, no. 6657.	1483

The 1486 Ulm Cosmography edition

eight-leaf flower	
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 2, p. 374, no. 6601.	1480
Gerhard Piccard, <i>Wasserzeichen Blatt, Blume, Baum</i> (Stuttgart 1982), no. 824.	1484
ox head with a crown on top	
WZIS, reference number DE8100-PO-70651	1478
simple form of a mountain with three peaks with a large cross on top encircled by a snake	
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 3, p. 596, no. 11832.	1483

The 1490 Rome Cosmography edition

cardinal's hat	
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 1, p. 224, no. 3391.	1491
www.wasserzeichen-online.de reference number, IT5235-PO-32312	1491
crossed arrows	
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 2, p. 362, no. 6280.	1506
crown in a circle	
Corpus Chartarum Fabriano reference number Z01131	1472
Nikolai Petrovich Likhachev, <i>Likhachev's Watermarks</i> (Amsterdam 1994), nr. 401.	1476

Corpus Chartarum Fabriano, reference number Z01166	1477
Corpus Chartarum Fabriano, reference number Z01167	1477
Corpus Chartarum Fabriano, reference number Z01278	1487
five-leaf flower	
no reference found	
ladder in a circle with a star on top	
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 2, p. 345, no. 5920.	1491
lily in a circle	
Gerhard Piccard, <i>Wasserzeichen Lilie</i> (Stuttgart 1983), no. 945.	1489
tau cross in a circle with a cross on top	
Gerhard Piccard, <i>Wasserzeichen Kreuz</i> (Stuttgart 1981), no. 99.	1492
scissors	
Charles M. Briquet, <i>Les Filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600</i> , 4 vols. (Paris 1907), vol. 2, p. 237, no. 3677.	1482-1498
Gerhard Piccard, <i>Wasserzeichen Werkzeug und Waffen</i> (Stuttgart 1980), no. 881.	1490

2 Overview of all the studied works

The titles are applied as found in the Gesamtkatalog der Wiegendrucke:
<https://www.gesamtkatalogderwiegendrucke.de/>

Works printed by Nicolo Tedescho

Monte santo di Dio, Antonio da Siena, September 10, 1477, GW 2204, 28,4 x 20 cm
 Milan, Biblioteca Nazionale Braidense Milano, shelfmark AN.XIII.4
 Milan, Biblioteca Trivulziana, shelfmark Triv.Inc.B1
 Rome, Biblioteca dell'Accademia Nazionale dei Lincei e Corsiniana, shelfmark 51.C.15

Disputationes Camaldulenses, Christoforo Landino not after September 12, 1481, GW M16839,
 26,5 x 18,5 cm
 Florence, Biblioteca Riccardiana, shelfmark Ed.R.410

La commedia, Dante Alighieri, Marsilio Ficino, August 30, 1481, GW 07966, 41,5 x 28,2 cm
 Florence, Biblioteca Riccardiana, shelfmark Ed.R.626
 Milan, Biblioteca Nazionale Braidense Milano, shelfmark AK.XV.18-19
 Rome, Biblioteca dell'Accademia Nazionale dei Lincei e Corsiniana, shelfmark 51.G.3-4

Orazione alla Signoria Fiorentina quando presento il suo commento di Dante, Christoforo Landino,
 after August 30, 1481, GW M16899, 20 x 13 cm
 Florence, Biblioteca Nazionale Centrale di Firenze, shelfmark Pal.E.6.4.23

Geographia, Francesco Berlinghieri, before September 10, 1482, GW 03870 42,5 x 28,5 cm
 Amsterdam, Scheepvaartmuseum, shelfmark Me 0376
 Barcelona, Biblioteca de Catalunya, shelfmark Inc. 47-Fol.
 Brussels, De Koninklijke Bibliotheek van België, shelfmark Inc C 208
 Chicago, Newberry Library, shelfmark Ayer 6.P9 B5 1480a
 Chicago, Newberry Library, shelfmark Ayer 6.P9 B5 1480b
 Florence, Biblioteca dell'Accademia della Crusca, shelfmark Inc. 34
 Florence, Biblioteca Nazionale Centrale di Firenze, shelfmark Magl. Inc. N_20
 Florence, Biblioteca Nazionale Centrale di Firenze, shelfmark Palat D.7.1.5
 Florence, Biblioteca Medicea Laurenziana, shelfmark Inc.I.5
 Florence, Biblioteca Marucelliana, shelfmark R.A.788
 Florence, Biblioteca Riccardiana, shelfmark SEDE.Ed.R.624
 Florence, Biblioteca del Seminario arcivescovile maggiore, shelfmark D III 56
 Historic Map Works, item number OL5386
 London, British Library, shelfmark C.1.d.1
 London, British Library, shelfmark C.3.d.10
 London, British Library, shelfmark G.8173
 London, The British Museum, shelfmark 163.b.1
 London, National Maritime Museum, shelfmark PBD 7690
 London, Royal Geographical Society, shelfmark CA15F-001
 London, Royal Geographical Society, shelfmark CA15F-002
 London, Specialist Dealer Daniel Crouch Rare Books and Maps, stock number Reference 12890
 Lucca, Biblioteca Statale di Lucca, shelfmark Inc.214
 Milan, Biblioteca Nazionale Braidense Milano, shelfmark AK.XVI.12
 Milan, Biblioteca Nazionale Braidense Milano, shelfmark AK.XVI.13
 Milan, Biblioteca Nazionale Braidense Milano, shelfmark AM.XV.36
 Milan, Biblioteca Nazionale Braidense Milano, shelfmark AC.XIV.44

Milan, Biblioteca Ambrosiana, shelfmark Inc.422
 Milan, Biblioteca Ambrosiana, shelfmark Inc.422bis
 Naples, Biblioteca Nazionale Vittorio Emanuele III, shelfmark S.Q.X.K.15
 Paris, Bibliothèque nationale de France, shelfmark C 2035 9
 Rome, Biblioteca Universitaria Alessandrina, shelfmark Inc.541
 Rome, Biblioteca Nazionale Centrale di Roma, shelfmark 70.1.G.5
 Rome, Biblioteca Nazionale Centrale di Roma, shelfmark 70.1.G.7
 Rome, Biblioteca Nazionale Centrale di Roma, shelfmark 70.1.G.10
 Rome, Biblioteca Casanatense, shelfmark Vol.Inc.1110
 Rome, Biblioteca dell'Accademia Nazionale dei Lincei e Corsiniana, shelfmark 51.G.1
 Siena, Biblioteca Comunale degli Intronati, shelfmark O.II.35
 Turin, Biblioteca Nazionale Universitaria di Torino, shelfmark XV.I.41
 Turin, Biblioteca Nazionale Universitaria di Torino, shelfmark XV.I.42
 Vatican City, Biblioteca Apostolica Vaticana, shelfmark Stamp.Ferr.S.37
 Vatican City, Biblioteca Apostolica Vaticana, shelfmark Inc.S.120
 Vatican City, Biblioteca Apostolica Vaticana, shelfmark Stamp.Ross.301
 Vatican City, Biblioteca Apostolica Vaticana, shelfmark Stamp.Barb.AAA.IV.15
 Vatican City, Biblioteca Apostolica Vaticana, shelfmark Urb.lat.273
 Venice, Biblioteca del Museo Correr, shelfmark Inc. D.013
 Venice, Biblioteca Nazionale Marciana, shelfmark Inc. 0037

Regole della vita spirituale e matrimoniale, second edition by Tedesco, Cherubino da Siena, October 22, 1482, GW 6598, 20,8 x 13,7 cm

Florence, Biblioteca Nazionale Centrale di Firenze, shelfmark Magl.A.6.68(b)
 Milan, Biblioteca Nazionale Braidense Milano, shelfmark AM.X.56
 Milan, Biblioteca Trivulziana, shelfmark Triv.Inc.D116

In funere Jordani Ursini oratio, Christoforo Landino, after March 13, 1483, GW M16898, 22 x 14,5 cm
 Florence, Biblioteca Riccardiana, shelfmark Ed.R. 537⁴

Rudimenta grammatices, Nicolaus Perottus, April 16, 1483, GW M3115310, 21 cm
 Budapest, Hungarian Academy of Sciences, shelfmark Inc.379

Horae ad usum Romanum, Unknown author, July 5, 1483, GW 13331, 13 x 9,5 cm
 Florence, Biblioteca Riccardiana, shelfmark Ed.R.726

Regole della vita spirituale e matrimoniale, third edition by Tedesco, Cherubino da Siena, July 31, 1483, GW 6599, 20,7 x 14 cm
 Florence, Biblioteca Nazionale Centrale di Firenze, shelfmark Magl.M.6.17

Moralia in Job, Gregorius I Pont. Max., June 15, 1486, paper ordered at the end of 1483 and in the beginning of 1484, GW 11438, 33 x 23 cm
 Florence, Biblioteca Riccardiana, shelfmark Ed.R.60-61
 Milan, Biblioteca Nazionale Braidense Milano, shelfmark AK.XII.14-15
 Milan, Biblioteca Trivulziana, shelfmark Triv.Inc.A19

La Sfera, Gregorio Dati, about 1485, GW 8025, 20,8 x 14 cm
 Milan, Biblioteca Trivulziana, shelfmark Triv.Inc.C 189/2

Sermones super Cantica canticorum, Gilbertus de Hoylandia, May 16, 1485, GW 10921, 28 x 20 cm
 Florence, Biblioteca Nazionale Centrale di Firenze, shelfmark Magl.H.2.6
 Milan, Biblioteca Trivulziana, shelfmark Triv.Inc.B.29
 Milan, Biblioteca Trivulziana, shelfmark Triv.Inc.194/1

De re aedificatoria, Leone Battista Alberti, December 29, 1485, GW 00579, 28 x 21 cm
 Den Haag, Koninklijke Bibliotheek Den Haag, shelfmark 170.D.18
 Florence, Biblioteca Riccardiana, shelfmark Ed.R.426
 Milan, Biblioteca Nazionale Braidense Milano, shelfmark AN.XIV.17
 Milan, Biblioteca Trivulziana, shelfmark Triv.Inc.B.198

Book printed by Francesco di Dino

Confessionale, Florentinus Antoninus, July 10, 1481, GW 02078, 20,8 x 13,7 cm
 Florence, Biblioteca Nazionale Centrale di Firenze, shelfmark Magl.A.6.68(b)

Book printed in the printing office of San Jacopo di Ripoli

Plato, Marsilio Ficino, May 1484, April 1485, GW M33912, 26,4 x 19,2 cm
 Milan, Biblioteca Nazionale Braidense Milano, shelfmark AO.XVI.3-5
 Rome, Biblioteca Nazionale Centrale di Roma, shelfmark 70.4.C.10

Book printed by Bartolomeo de Libri

Orationes, Bartholomaeus Fontius, after November 11, 1487, GW 10171, 22 x 14,5 cm
 Florence, Biblioteca Riccardiana, shelfmark Ed.R. 537⁴

3 Watermarks in books and oratio's printed in Florence

Works printed by Nicolo Tedescho

Monte santo di Dio, Antonio da Siena, September 10, 1477
 cardinal's hat type 2, type 3 and several undetermined variants
 crossbow in a circle
 crossed arrows two variants
 crowned eagle four variants
 ox seven variants
 R in a circle with a cross on top

Disputationes Camaldulenses, Christoforo Landino, not after September 12, 1481
 cardinal's hat type 2
 crossbow in a circle two variants
 ladder two variants
 R in a circle with a cross on top

La commedia, Dante Alighieri, Marsilio Ficino, August 30, 1481
 cardinal's hat type 1a, 1b, 1c, 1d, 3, 4a, 4c, 4d, and five variants

Orazione alla Signoria Fiorentina quando presento il suo commento di Dante, Christoforo Landino,
 after August 30, 1481
 cardinal's hat type 1c

Regole della vita spirituale e matrimoniale second edition by Tedescho, Cherubino da Siena,
 October 22, 1482
 dragon two variants
 Greek cross in a circle

In funere Jordani Ursini oratio, Christoforo Landino, after March 13, 1483
 Greek cross in a double circle

Rudimenta grammatices, Nicolaus Perottus, April 16, 1483
 five-leaf flower
 lily

Horae ad usum Romanum, Unknown author, July 5, 1483
 cardinal's hat type 7 several variants

Regole della vita spirituale e matrimoniale, third edition by Tedescho, Cherubino da Siena, July 31, 1483
 Greek cross in a circle two variants

Moralia in Job, Gregorius I Pont. Max., June 15, 1486, paper ordered at the end of 1483 and in the
 beginning of 1484
 cardinal's hat five variants
 cardinal's hat type 7 five variants
 five-leaf flower with a cross on top two variants
 ox five variants
 shearer scissors type 1 or 2

La Sfera, Gregorio Dati, about 1485
crossed hammers in a circle
Greek cross in a double circle

Sermones super Cantica canticorum, Gilbertus de Hoylandia, May 16, 1485
Greek cross in a double circle two variants
lily two variants
tulip

De re aedificatoria, Leone Battista Alberti, December 29, 1485
crossed hammers in a circle two variants
crown two variants
Greek cross in a circle two variants
Greek cross in a double circle two variants
lily two variants
lion
m
m with a cross on top two variants
simple form of a mountain with three peaks and a cross on top two variants
star in a circle
tulip two variants

Book printed by Francesco di Dino

Confessionale, Florentinus Antoninus, July 10, 1481
dragon two variants
five-leaf flower
hand

Book printed in the printing office of San Jacopo di Ripoli

Plato, Marsilio Ficino, May 1484, April 1485
boat with a cross on top two variants
cardinal's hat type 7 six variants
crossed hammers in a circle
Greek cross in a circle two variants
Greek cross in a double circle
lily with a cross on top two variants
m
star in a circle with a cross on top two variants
tulip two variants

Book printed by Bartolomeo de Libri

Orationes, Bartholomaeus Fontius, after November 11, 1487
crossed hammers in a circle
lily
m

4 Titles of maps on the maps and in the gazetteers

	MAPS	GAZETTEERS
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5 State differences on three proof prints

London, National Maritime Museum, shelfmark PBD 7690

The map GALLIA NOVELLA

General remarks

There is no general title yet in the upper blank space of the map.

No liber indication could be detected.

Left side of the map, before the addition in the first and second state

Near the the lower part of England, just under a peninsula, before the addition of the toponym *purlano c.*

In the Northern part of France, below *PICCARDIA* and *doay*, before the addition of *aras*.

In France, more to the centre, above *noyon* and *nanc* before the addition of *verma*.

In France near *copiegne*, before the addition of *soisons*.

In France near a mountain just lower of *Laon*, before the addition of *Lanse?* (Could not be verified with certainty)

In France, just above Paris, before the river indication *FI S. EQVANA*.

In France near the fold, next to *BITVRIA*, before the addition of the letter *e* above *lacher fi*.

In France, to the right of *LIMOGINO*, just below *nostra dona*, before the addition of *amador*, including the roundel.

In France, just above Bordeaux next the river *gironde*, before the addition of the river indication *e garvnnna*.

In France, in the lower part, just left of *LIMOGINO* and *potiers*, before the addition of the river indication *othion fi* and *litvey fi*.

In France, above and to the left of the last described feature, before the addition of the river indications *lera e ligeri fi*.

In France to the right of the last described feature, in the area between *angers*, *tors*, *loys Ambrose* and *lisac*, before the addition of the names *beamot*, *s. agnei* and roundel, *villafranca*, *vierro*, *metav*, *selles* and *vione fi*. and before the addition of the roundel near *bloys*.

In France, just below the capital indication *NORMADIA*, before the addition of *sanmalo*.

In France, left of *nante* before the addition of the toponyms *anbon*, *tamarei*, *birana*, *carade*, and *s. lazar*.

In France, just below of the last described feature, before the addition of *PITTAVIA* and *SANTONGES*.

In France, left of the indication *BRETTANIA*, before the addition of *clandor* and *dierna* including its roundel.

Left side of the map, before the changing in the first and second state

In the lower part of England completely to the right, before the changing of *remaneo* into *romaneo*.

In France, near the centre *limioges*. This changes into *linioges*.

To the left and above the word *FRANCIA*, the indication *alanco*. This changes into *alancon*.

Right side of the map, before the addition in the first and second state

In the low Countries above left of *olanda*, before the addition of the letter *A*.

In Germany above left, before the addition of *BESTVALIA* just above the mountain range and just below it, before the addition *BERCHLANT* and *MAGNA GERMANIA*.

In Germany, to the extreme right, before the addition of *BOEMIA*.

In Germany, just below and left of centre of the forest indication, before the addition of *oys*.

In Germany, near the Ardennes region, before the indication *BESTERBALT* and below this the river indication *reno fi*.

In Germany, to the right of the last feature, before the addition of *Franconia*.

In Germany, below *BAVERIA*, before the addition of the vertically placed *ALPE MONTI* in the large mountain range.

In France, to the left and centre of the page, before the addition of *cana*, *RROES* and just above *calos* the addition of *ANIA*.

In France, just below the last described feature, before the addition of *el*, just above the river indication *graver Fi*.

In Italy, to the right of *SAVOIA*, before the addition of *MOTE DI S. BERNARDO*.

In Italy, just below the last described feature, before the addition of *era* below *ferio* and the addition of a second *susa* with a triangle to the right of the earlier feature.

In Italy, just below the last described feature, before the addition of *VESVLO MO*.

In Italy, below the last described feature, before the addition of the river indication *dvretia fi*.

In France, vertically below *DALFINATO*, before the river indication *bodano fi*.

In France, in the lower part, below *bagni*, before the addition of *valetinois* and below *Orange*, before the addition of *carpetras* and *veretv*.

In France, just below the last described feature, before the addition of *bargna*, before the indication of a bridge across the river to the right of *bargna*, just below this feature, to the right of *nimis*, before the addition of *villanova* and *belcaire*.

In France, just below and to the left of the last described feature, before the addition of the rivers and indications *aravrio fi*, *orobio fi* and *atago fi*.

In France, more up and to the left, before the addition of *ARVERNII ET CEMENI MONTI*.

In France, at the lower coastline, below *PROVETIA*, before the addition of *bedormi* and *tolon*.

Right side of the map, before the changing in the first and second state

In France, near the Ardenne region, the indication *verdvm*. This changes into *verdvm*. The indication *lvceborg* has one accent indication. This changes into two accents.

In France, below the last described feature, between the two mountain ranges, *natesi* has a horizontal line through the letter E. This line is removed.

In France, in the lower part, above *LINGVADOCHO*, the indication *DALFINATO*. The A is later covered by an E.

In Italy, in the Northern part, above *niza*, the river indication *varo fi*. This is crossed out and moved somewhat to the left of its original position.

In Switzerland, near *SAVOIA*, four lakes are covered by wave indications. The top and lowest lake are later covered with a crosshatching of small dots.

The map TABVLA SEXTA D EVROPA

General remarks

In the general title ASIA is engraved instead of EVROPA.

No liber indication could be detected.

Left side of the map, before the addition in the first and second state

In Switzerland, near the upper border of the image, in the mountain range, below *CENTRONI*, before the addition of *GLEE ALPE*.

In Switzerland, below the last described feature, below *LEPOTINI*, before the addition of *verban*.

In Switzerland, on the right side of the last described feature, below *axima*, before the addition of *lago* with a roundel.

In Italy, below the last described feature, near the river, before the addition of *pado fi*.

In Italy, to the right of the last described feature, near the border of the mountain range, just above *vavnia*, before the addition of *lario lago*.

In Italy, below and to the right of the last described feature, above *bergomo*, before the addition of *benaco*.

In Italy, below the last described feature, above *VENETIA*, before the addition of *tridento*.

In Italy, below the last described feature, below *VENETIA*, before the addition of *lago*.

In Italy, to the right of the last described feature, in the Adriatic Sea, before the addition of *venetia*.

- In Italy, to the right of the last described feature, below *tergesto*, before the addition of *pvcino*.
- In Italy, to the right of last described feature, near the fold, before the addition of *alvo* and *pola* with a roundel.
- In Italy, to the centre, below *forodivguto*, before the addition of *CENOMANNI*.
- In Italy, to the right of the last described feature, below Verona, before the addition of *BVTRIO*, before the removal of *bvtrio* and *trideto* left of *GALIBOII*. Traces of these removed indications remain visible.
- In Italy, to the right of the last described feature. Below *ravenna*, on the Adriatic coast, before the addition of *GALLI*.
- In Italy, to the left of *LIBYCI*, below *agusto*, before the addition of *dertona*.
- In Italy, below and to the right of the last described feature, before the addition of a roundel below and to the left of *phidetia*.
- In Italy, more to the left of the map, above *tavcroici*, before the addition of *vercelle* and *doria fi*.
- In Italy, to the left of the last described feature, in the Alps Mountain range, below *brigatio*, before the addition of *penino lago* and the enlargement of the roundel into a lake.
- In France, almost to the left border of the image, below the mountain range, before the addition of *nicea*.
- In Italy, to the right of the last described feature, below *LIGVRIA*, before the addition of *albinimino*.
- In Italy, in the mountain range, before the addition of *APENI*.
- In Italy, below *TVSCI*, before the addition of *ruselle* and *aretio*.
- In Italy, below the last described feature, to the right of *svana*, before the addition of *vetulonio* and *traiano por*.
- On the left side of the island of Corsica, above *TARRABENI* and *viribaillo pmo*, before the addition of *CASALOSENO*.
- To the right of the last described feature, below *venicio* and *opino*, before the addition of *mora*.
- Left side of the map, before the changing in the first and second state
- In Switzerland, near the upper leftcorner, in the mountain range, before the change of *sagvsio* into *segvsio*.
- In Switzerland, below the last described feature, somewhat to the right, before the change of *ostela* into *oscela*.
- In Italy, below *vavnia*, before the change of *caraoa* into *caraca* with a changed accent mark.
- In Italy, to the right of the last described feature, left above *VENETIA*, before the change of *opitergo* with a vertical line in the last letter o.
- In Italy, above *CENOMANNI*, before the change of *rrixia* into *brixia*. The removed letter r is still visible inside the replaced letter b.
- In Italy, to the left of *LIBYCI*, before the addition of the letter u above *agusto*.
- In Italy, to the right of the last described feature, below *isvio*, before the change of the roundel with the addition of a vertical line.
- On the island of Corsica, in the centre, before the change of *cinesto* into *cenesto*.
- Right side of the map, before the addition in the first and second state
- In the Adriatic Sea, above *diomedee isole*, before the filling in with dots of the letter O of *RIATICO*.
- In Italy, to the left near the fold, below *ancona*, before the addition of the river indication *sio fi*.
- In Italy, in the Appenine mountain range, before the addition of *NIMONTI*.
- In Italy, below the last described feature and below the mountain range, below *VILVMBRI* and above *anagnina*, before the addition of *almeria*.
- In Italy, to the right of the last described feature, before the addition of *EQVICVLI*.
- In Italy, to the right of the last described feature, before the completion of the river. It ends in completed form in *cliterno*.
- In Italy, to the right of the last described feature, in the mountain range, before the addition of *aex*.
- In Italy, to the left of *CAMPANI*, before the addition of *setia*.
- In Italy, below the last described feature, below *tarracina*, before the addition of a roundel.
- In Italy, to the right of the last described feature, in the peninsula, before the addition of *caieta*.

In the Mediterranean Sea, below the last described feature, below the most left island, before the addition of *isola* before *padatoria* before removal of *potia* on the topside of the island.

In the Mediterranean Sea, in the island right of the last described feature, before the addition of *pontia isola*.

In Italy, in the curve of the mountain range, right of *aolonia*, before the addition of *cludio*.

Right side of the map, before the changing in the first and second state

In Italy, in the centre of the map, above the Appenine mountain range, below *PELIGNI*, before the change and replacement of the indication *anxano*. The remnants of the old indication remain faintly visible.

The map TABVLA QVARTA DI LIBYA

General remarks

No liber indication could be detected.

The coastlines display a lot of burr and print very black.

Left side of the map, before the addition in the first and second state

In Spain, in the upper left corner, before the addition of *hispania* and just below and to the right, before the addition of *iberico mare*.

To the extreme left next to the border of the image, before the addition of the vertically placed *OCCIDENTALE OCEANO*.

To the right of the last described feature, before the addition of the vertically place *ATLANTICO MARE*.

Below the last described feature, before the addition of *fortunate isole* in the islands.

Below the last described feature, before the addition of *HESPERIO SENO*.

In Africa, next to the island *isola digvinone*, below *AVTOLALE*, before the addition of *sirange*.

Just below the upper border of the image, before the addition of *SARDOO*, *sardinia*, *TYRENE*, *sicilia* and *ADRIATICO*.

Below the last described feature, before the addition of *APHRICANO PELAGO*.

In Africa, below and to the left of the small circular mountain range *SARGALA*, before the addition of *NIGRITE ETHIOPI*.

In Africa, more to the left of the last described feature, below *PHARVSII* and *segapola mons*, before the addition of *SALTHII*, *DAPINITE*, *ZAMACCE* and *AROCCE* and to the right just above *tucaba*, before the addition of *CETMANI*.

In Africa, below the last described feature, to the left of *MACHVREBI*, before the addition of *MADORI*, *DARADI* and *SOPHOCEI*.

Left side of the map, before the changing in the first and second state

In Africa, below the mountain range *SARGALA*, before the change of the letter *O* in *SVBVRPORE*.

In Africa, to the right of the last described feature, before the change of the roundel below *girempli* into a square.

In Africa, vertically below the island *isola digvinone*, before the change of *MAVSO* into *MAVSOLI*.

In Africa, to the left of the mountain range *RYSADIO MOTE*, before the change of *clonia* into *clonania*.

In Africa, just below the last described feature, before the change of *catharop* into *catharopa*.

In Africa, above *ETHIOPIA INF.*, before the change of *CADIDA* into *CADIDIA* with a line through the last letter *a*.

Right side of the map, before the addition in the first and second state

In upper left corner, before the addition of *LAGO GRETICO*.

In Greece, near the upper border of the image, before the addition of *peloponeso*, *creta* and *rodo*.

Below the last described feature, above the African coast, before the addition of *LYBICO MARE*, *EGYPTIACO PELAGO* and *SYRIACO*.

To the right of the last described feature, before the addition of the island and indication *cyprio*.

In the Arabian gulf, to the centre, above *cnesoneso fi*, before the addition of *prienoto*.

In the Arabian Gulf, at the lower part, before the addition of *dei side* in the island.

- In Africa, in the centre, above *ELEPHAPHAGI*, before the addition of *to* above this indication.
- In Africa, to the right of the mountain range *MASTA*, before the addition of *essima* and *buono empirio*.
- Right side of the map, before the changing in the first and second state
- In Africa, in the Egypt region, before the change of *CYRENAIC* into *CYRENAICA* with the letter *a* placed inside the letter *c* and the changing of *TYTTO* into *TVTTO*.
- In Africa, below the last described feature, in the vertical central mountain range, before the change of *MONTI ETHIOPI* into *MONTI ETHIOPICI*.
- In Africa, below the last described feature, in the circular river, before the change of *maroe* into *meroe* and next to this feature, before the change of *sabatha* into *sabathaci*.
- In Africa, to the left of the vertical mountain range, inside the circular mountain range, before the change of *garamatica vale* into *garamatica valle* and the addition of an exclamation sign above *atica*.
- In Africa, above *TROGLODITICA REGIONE*, before the change of *avdilia* into *aydylia*.
- In Africa, between the mountain range *ELEPHANTI MOTE* and the right border of the image, before the change of *aromatae* into *aromataer*.
- In Africa, to the right of *ERIORE*, above the lake, before the change of *GNAMOPHORA REG* into *GINAMOPHORA REG*.
- In Africa, below the last described feature, next to the right border of the image, before the replacement of the island and indication *damico*. In the later state *damico* is placed in the border work. Remains of the first placement of *damico* are still visible inside the island.
- In Africa, to the right of the last described feature, left of the mountain range *GARBATA*, before the change of *nxv* into *nxbe*.
- In the lower right corner, next to the border of the image, before the change of *manvthia* into *menvthia*.
- In Africa, near the lower border of the image, before the change of *REGIONE DELI ETHIOPI* into *REGIONE DELLI ETHIOPI* with an added accent.

6 Manuscripts viewed, studied on or downloaded from the internet

Cambrai, Bibliothèque municipale de Cambrai

<https://bvmm.irht.cnrs.fr/consult/consult.php?reproductionId=10497>

shelfmark Lat 926 copy of Pierre d'Ailly, 1411-1420

Florence, Biblioteca Medicea Laurenziana

<http://mss.bmlonline.it/?&search=plut.30.1>

shelfmark Plut.30.1, about 1480

<http://mss.bmlonline.it/?&search=plut.30.2>

shelfmark Plut.30.2, about 1455-1462

<http://mss.bmlonline.it/?&search=plut.30.3>

shelfmark Plut.30.3, about 1466-1468

<http://mss.bmlonline.it/?&search=plut.30.4>

shelfmark Plut.30.4, about 1468-1471

<http://mss.bmlonline.it/?&search=plut.28.49>

shelfmark Plut.28.49, mid fourteenth century

London, British Library

http://www.bl.uk/manuscripts/FullDisplay.aspx?ref=Add_MS_19391

shelfmark Ms19391

shelfmark Burn.111

Milan, Biblioteca Nazionale Braidense Milano

Shelfmark AC.XIV.44

Nancy, Bibliothèque-médiathèque de Nancy

https://upload.wikimedia.org/wikipedia/commons/5/5c/La_Cosmographie_de_Claude_Ptolem%C3%A9e.pdf

<http://bm-n-renaissance.nancy.fr/items/show/1236>

shelfmark ms. 354 copy of Cardinal Fillastre, 1427

New York, New York Public Library

<https://digitalcollections.nypl.org/items/510d47db-1479-a3d9-e040-e00a18064a99>

shelfmark MssCol 2557, 1460

Paris, Bibliothèque nationale de France

<https://gallica.bnf.fr/services/engine/search/sru?operation=searchRetrieve&version=1.2&query=%28gallica%20all%20%22COSMOGRAPHY%22%29&lang=fr&suggest=0>

https://catalogue.bnf.fr/changerPage.do?motRecherche=&index=TOUS3&numNotice=11920750&listeAffinages=FacSujGeoEtendu_15238497;AUT3_11920750&nbResultParPage=100&afficheRegroup=false&pageEnCours=1&trouveDansFiltre=NoticePUB&trouverDansActif=false&triResultParPage=2&criterRecherche=&typeNotice=&pageRech=rsi

shelfmarks

Lat.8834 copy of Matthias Corvinus King of Hungary, 1476-1480

Latin 4801, 1450-1471

<https://gallica.bnf.fr/ark:/12148/btv1b55002486w>

Latin 4802 with maps by Hugo de Comminellis di Mezieres and Pietro del Massaio, copy of Alphonso King of Naples, about 1456?

<https://gallica.bnf.fr/ark:/12148/btv1b8454687p>

<https://archivesetmanuscrits.bnf.fr/ark:/12148/cc63677b>

Latin 4804, 1485

Latin 10764, 1490

<http://gallica.bnf.fr/ark:/12148/btv1b9066841h/f1.planchecontact>

Grec 1401, text end of fifteenth century, maps early sixteenth century

<http://gallica.bnf.fr/ark:/12148/btv1b10538030z>

Grec 1402, second half fifteenth century

<http://gallica.bnf.fr/ark:/12148/btv1b6000512m>

HL 1, 1466-1500

<https://gallica.bnf.fr/ark:/12148/btv1b550071690/f1.planchecontact>

Valencia, Universitat de Valencia

https://weblioteca.uv.es/cgi/view.pl?source=uv_ms_0693

shelfmark ms. 0693

Vatican City, Biblioteca Apostolica Vaticana

<http://www.mss.vatlib.it/guii/scan/link1.jsp?fond=Urb.lat>

shelf marks

Urb.Lat.273 copy of Federico d'Urbino, 1482

Urb.Lat.274, fifteenth century

Urb.Lat.275, fifteenth century

Urb.Lat.277 with maps by Hugo de Comminellis di Mezieres and Pietro del Massaio, copy of Federico d'Urbino, 1472

<http://www.mss.vatlib.it/gui/scan/link1.jsp?fond=Vat.lat>

shelfmarks

Vat.Lat.3811, fifteenth century

Vat.Lat.5699 with maps by Hugo de Comminellis di Mezieres and Pietro del Massaio, 1469

Vat.Lat.7289, fifteenth century

<http://www.mss.vatlib.it/gui/scan/link1.jsp?fond=Urb.gr>

shelfmarks

Urbinas Graecus 82 copy of Chrysoloras, drawn up by the Patriarch of Aleandria, Athanasius the Younger, for Emperor Andronicus II Palaeologus, 1282-1328

Urbinas Graecus 83

7 Differences in the text between the manuscripts and the printed edition

PARIS C 2035 9 PRINTED EDITION PAGE: GEOGRAPHIA DI FRANCESCO Berlinghieri, Considerando	VATICAN Urb.lat.273 MANUSCRIPT PAGE: GEOGRAPHIA DI FRANCESCO BERLINGHIERI, CONSIDERANDO
inuincibile Federigo ognhuomo innanzi glocchi adduxe disire con quel extende contiene latino apprende anchora et regularly applied gente non cerhando poco acquista immortale eltexuto giuxta in tanto vigilata mondo non color insu labri incontro fuggie il seguate elueder chosi	invictiss. F. ogni huomo inanzi gliocchi addusse desire coquel extendo cotiene illatino apprehende anchor & regularly applied gete no cercando poco acquista immortale iltexuto iuxta in tato vigilante modo no coloro insulabbri incotro fugge el seguate ilueder cosi

PARIS C 2035 9 PRINTED EDITION PAGE: IN QVALE LIBRO	VATICAN Urb.lat.273 MANUSCRIPT PAGE: In quale libro
arachosia armenia mino asia propria baccriana bethica hispania bithynia ethiopia sotto egipto Euboia et altre Iazyge metanaste Illyride Lybia interiore Lycia lugdunense marmarica libya mysia superior panonia superior sarmatia in asia scythia etra imao tarraconense	aracosia armenia minor asia ppa bactriana betica hispania bithinia ethiopia sotto egypto euboia & altre iazige metanaste illiride Libia interiore licia lugdunese marmarica lybia mysia superiore panonia supior sarmatia i asia scithia etro ima tarraconese

PARIS C 2035 9 PRINTED EDITION APOLOGIA: Marsilii ficini florentini Apologus ad Federicum	VATICAN Urb.lat.273 MANUSCRIPT APOLOGIA: Apologus Marsily phicini floretini in librum Geographie
iuppiter omnipotes imperiu quem mercuriusque tanto et numinu poetica ducesque iterum twice atque clauam plerique duci interim quam Subicit	iupiter omnipotens imperium que mercuriusq tato & numinum terrena ducesq uterum twice atq claua pleriq duii interum q subiicit

<p>MILAN AC.XIV.44 MANUSCRIPT PAGE: GIA LAURIGA DI TITANO</p>	<p>PARIS C 2035 9 PRINTED EDITION PAGE: GEOGRAPHIA DI FRANCESCO Berlinghieri, Gia lauriga di Titano</p>	<p>VATICAN Urb.lat.273 MANUSCRIPT PAGE: GEOGRAPHIA DI FRANCESCO BERLINGIERI, GIA LAURIGA dititano</p>
<p>Missing addorno sagictario charreggiando el anchor peoteva et/& missing chollo despura quella angelica p le mia andracontar chose prese marauigliar ciaschuna che il canto cosa troppa lohuom reduiuyendo ueghiando dome cura di se stesso allo uniuerso p che chol suo p adnumerare lisimacho cambyse duole cartaginesi el meandro ilcaistro de piu</p>	<p>PRIMUS FELICITER INCIPIT adorno sagiptario careggiando il anchor percoteva et collo despira quella angelica per le mie ad raccontar chose presente marauigliar ciaschuna chel canto chosa troppo lhuom rendeuiuedo ueghiando dorme di se stesso cura all uniuerso perche col suo per adnumerare lysimaco cambyse dole cartaginesi el meandro il caystro de piu</p>	<p>FELICEMENTE INCOMINCIA addorno sagictario carreggiado el ancora percoteva & collo despira quelangelica perlemia a raccontar cose presente marauigliar ciascuna chel canto cosa troppo lhuom rendeuiuyendo ueghiando dorme cura disestesso allo uniuerso perche col suo per annumerare lisimacho cambise dole carthaginesi il meandro elcaistro di piu</p>

<p>MILAN AC.XIV.44 MANUSCRIPT FIRST PAGE LIBER SECVNDVS: Claudio ptholomeo ildi secondo</p>	<p>PARIS C 2035 9 PRINTED EDITION FIRST PAGE LIBER SECVNDVS: Claudio tholomeo ildi secondo</p>	<p>VATICAN Urb.lat.273 MANUSCRIPT FIRST PAGE LIBER SECVNDVS: CLAUDIO PTOLOMeo il di secondo</p>
<p>ptholomeo & Albione modo & Lusitania betica lasupna & Illyri & Liburnia pma presuppongha & far couegna diuiso & disegni & monstra aqualunque adaptar egeg citta diciotto & qual p terra libia quattro & & citta piu tra laltre in citta p diligentia ciascun pagrorno & intelligentia p contemplationi haute giudicar repetere p epilogo p quale ciaschun & porre & ciaschun sotto & tutti & e parallelli & sendo monstro</p>	<p>tholomeo & Albione mondo & Lusitania Bethyca lasuperna Illyri & Liburnia prima presupponga & far conuegna diuiso & disegni & monstra aqualunque adaptare engegna cicta diciocto & qual per terra libya quattro & & cicta piu tra laltre in citta per diligentia ciascun peragrorno & intelligentia per contemplationi hauute giudicare repeter per epilogo per quale ciascun & porre & ciaschun socto & tutti & e parallelli & sendo monstro</p>	<p>ptolomeo et Albione mondo et Lusitania Bethica lasuperna Illiri & Liburnia prima presupponga et far conuegna dunso et disegni & monstra aqualunche adaptare engegna cicta diciocto et qual per terra lybia quatro et et cicta tra llaltre piu in cicta per diligentia ciaschun peragrorno et intelligentia per contemplationi haute giudicare repeter per epilogo per quale ciaschun et porre et ciaschun sotto et tutti & parallelli et sendo monstro</p>

*8a Applied toponyms in the gazetteers and on the map TABVLA
SEPTIMA DE EVROPA in both manuscripts and the printed edition*

MILAN AC.XIV.44 MANUSCRIPT GAZETTEER	MILAN AC.XIV.44 MANUSCRIPT MAP	PARIS C 2035 9 PRINTED EDITION GAZETTEER	PARIS C 2035 9 PRINTED EDITION MAP	VATICAN Urb.lat.273 MANUSCRIPT GAZETTEER	VATICAN Urb.lat.273 MANUSCRIPT MAP
Abacena	Abacena	Abacena	Abaciena	Abacena.	Abacena
Acithio infoce	achitio	Acithio in foce	Acithio	Acithio infoce.	Acithio
Acree	Acree	Acree	Acree	Acree.	Acree
Agathyrio	Agathyrio	Agathyrio	Agathyrio	Agathyrio.	Agathyrio
Acragantio	Acragatio	Acragantio	Acragatio	Acragantio.	Acragatio
Acraga	Acraga	Acraga	Acraga	Acraga.	Acraga
Agurio	Agurio	Agurio	Agurio	Agurio.	Agurio
Alabo infoce	Alabo fl	Alabo in foce	Alabo fi	Alabo in foce.	Alabo fiume
Alcta	Alcta	Alcta	Alcta	Alcta.	Alcta
Alesa	Alesa	Alesa	Alesa	Alesa.	Alesa
Alontio	Alotio	Alontio	Alotio	Alontio.	Alontio
Ancrina	Ancrina	Ancrina	Ancrina	Ancrina.	Ancrina
Aque hysitane	Aqqe hypsitane	Aque hysitane	Aqqe hypsitane	Aque lysitane.	Aqqe hypsitane
Aque lesitane	Aqqe lesitane	Aque lesitane	Aqqe lesitane	Aque lesitane.	Aqqe lesitane
Aque neapolitane	Aqqe neapolitane	Aque neapolitane	Aqq neapolitane	Aque neapolitane.	Aqqe neapolitane
Argeno. pro.	Argen por	Argeno.pro.	Argeno prom	Argeno pro.	Argeno prom
Arcto. pro.	Arcto por	Arcto.pro.	Arcto pr	Arcto pro.	Arcto pmy?
Assero	Assero	Assero	Assero	Assero.	Assero
Bathio infoce	Batheo fl	Bathio in foce	Batheo fi	Bathio in foce.	Batheo flu
Boeia	Biea por?	Boeia	Biea por	Boeia.	Biea porto
Bosa	Boja	Bosa	Bosa	Bosa.	Bosa
Bucra	Bucra p	Bucra	Bucra por	Bucra.	Bucra pmy?
Cacyro	Cacyro	Cacyro	Cacyro	Cacyro.	Cacyro
Calacta		Calacta	Calacsta	Calacta.	Calacta
Camarina		Camarina	Camarina	Camarina.	Camarina
Capitio	Capitio	Capitio	Capatio an i through the a	Capytio.	Capytio.
Caralli	Carali	Caralli	Caralli p et ci	Caralli.	Caralli pmo & ci
Caralitenio	Caraliano golfo	Caralitenio	Caralliano gol	Caralitenio.	Caralliano seno
Catana	Catana golf	Catana	Catana col	Catana.	Catana col
Caucana porto	Caucana por	Caucana porto	Caucana por	Caucana porta.	Caucana porto
Cedro in foce	Cedrio fl	Cedro in foce	Cedrio fi	Cedro in foce.	Cedrio flu
Cephalede	Cephalede	Cephalede	Cephalede	Cephalede.	Cephalede
Centuripe	Ceturipe	Centuripe	Ceturipe	Centuripe.	Ceturipe
Cetaria	Cetaria	Cetaria	Cetaria	Cetaria.	Cetaria
	Chesoneso logo po		Chesoneso logo p		Chesonei longo pm
Chersoneso	Chersoneso	Chersoneso	Chersoneso	Chersoneso.	Chersoneso
Chyda infoce	Chyda fl	Chydia in foce	Chyda fi	Chyda in foce.	Chyda fiue
Columbario: pro:	Columbario por	Columbario:pro	Colubario piir	Columbario pro.	Colubaria pmoy?
				Coracensio.	
Coracode porto	Coniccode porto	Coracode porto	Coracode por	Coracode porto.	Coracode porto
Corno	Corno	Corno	Corno	Corno.	Corno
Cotyrga	Cotyrga	Cotyrga	Coryrga	Cotyrga.	Cotyrga
Crato monte	Crata mote	Crato monte	Crata mo	Crato monte.	Crata monte

MILAN AC.XIV.44 MANUSCRIPT GAZETTEER	MILAN AC.XIV.44 MANUSCRIPT MAP	PARIS C 2035 9 PRINTED EDITION GAZETTEER	PARIS C 2035 9 PRINTED EDITION MAP	VATICAN Urb.lat.273 MANUSCRIPT GAZETTEER	VATICAN Urb.lat.273 MANUSCRIPT MAP
Cuniocario	Cuniocherio	Chuniochario		Cuniochario.	Cuniocharo pmoy?
Curuli	Guruli vechia	Curuli	Guruli vecchia	Caruli. a u above the a	Guruli vecchia
	Guruli nova		Gurulinova		Guruli nova
Curili		Curili		Curili.	
Diabasta	Diabasta isol	Diabasta	Diabasta isola	Diabasta.	Diabasta
Didyma	Didima	Didyma	Didyma	Didyma.	Didyma
Dymetho	Dimetho	Dymetho	Dymetho	Dimetho.	Dymetho
Drepano	Drepano	Drepano	Drepano	Drepano.	Drepano
Egitarso pro:	Eguthaso p	Egitharso.pro.	Egitharso pro	Egitharso pro.	Egitharso prmony?
	Egusa		Egusa		Egusa
Eleuthero infoce	Eleuthero fl	Eleuthero iu foce	Eleuthero fi	Eleuthero infoce.	Eleuthero flu
Elcethio	Elcethio	Elcethio	Elcethio	Elcethio.	Elcethio
Helicon infoce	Helicon fl	Helicon in foce		Elicon in foce. h added in front of	Elico fiue
				Elicon	
Eloro	Eloro	Eloro	Eloro	Eloro.	Eloro
				Emicara.	
Emporiorio	Emporio	Emerio	Emporio.	Emporio
Engio	Engio	Engio	Engyo	Engio.	Engyo
Enna	Enna	Enna	Enna	Enna.	Enna
Entella	Etella	Entella	Entella	Entella.	Entella
Eolo isola	Isola de reo	Eolo isola	Isola Deeolo	Eolo isola. de added in front of	Isola eolo
				Eolo	
Eraclea	Heraclea	Eraclea	Heraclea	Eraclea. h added in front of	Heraclea
				Eraclea	
Erbesso	Erbesso	Erbesso	Erbesso	Erbesso.	Erbesso
Erbita	Ebrita	Erbita	Erbita	Erbita.	Erbita
De hercole isola corrected E in D	Isola de hercole	De hercole isola	Isola de hercole	Eercole isola. h added in front of	Isola de hercole
				Eercole	
Herculeo porto	Hercul poto and Hercule porto	Herculeo porto	Hercul po	Herculeo porto.	Hecole port
Erebantio	Erebatio por	Erebantio	Errebatio pr	Erebantio.	Errebatio pmy?
Ereo	Hereo	Ereo	Hereo	Ereo.	Ereo
Ermea isola	Hermea isola	Ermea isola	Hermea isola	Ermea isola.	Hermea
Ermeo pro.	Hermeo p	Ermeo.pro.	Hermeo pmi	Ermeo pro.	Hermeo promy?
Ericino	Ericino	Erycino	Ericyno	Erycino.	Ericyno
Ericode	Ericode	Ericode	Ericode	Ericode.	Ericode
Etna monte	Etna mote	Etna monte	Etna mote	Ethna monte.	Etna monte
Etnie	Etne	Etnie	Etne	Ethne.	Etne
Euonimo	Euonymo	Euonymo	Euonymo	Euonymo.	Euonymo
				Falacrio pro.	
Gela	Gela	Gela	Gela	Gela	Gela
Gorditano	Gorditano p	Gorditano	Gorditano pmi	Gorditano	Gorditano pmy?
	Hibla		Hybla	Hybla.	Ibla
Idia	Idia	Idia	Idia	Idia.	Idia
	Icesia isola		Icesia isola	Icesia isola.	Icesia
Hieraco	Ieraco isola	Hieraco	Hieraco isola	Hieraco.	Hieraco
Ilua isola	Ilua isola	Ilua isola	Ilua isola	Ilua isola.	Ilua

MILAN AC.XIV.44 MANUSCRIPT GAZETTEER	MILAN AC.XIV.44 MANUSCRIPT MAP	PARIS C 2035 9 PRINTED EDITION GAZETTEER	PARIS C 2035 9 PRINTED EDITION MAP	VATICAN Urb.lat.273 MANUSCRIPT GAZETTEER	VATICAN Urb.lat.273 MANUSCRIPT MAP
Himera in foce	Himera fl	Himera in foce	Himera fi	Imera in foce. h added in front of Imera	Himera flu
Imicara Ina Hipsa infoce	Imicara Hypsa fl	Imichara Ina Hipsa in foce	Imichara Ina Hypsa fi	Imichara. Ina. Ipsa infoce. h added in front of Ipsa	Imichara Ina Hypsa fiume
Isburo infoce Iuliola .n. Leontio Lego Lesa Lelibeo Lipara Longo pro.	Hisporo fl Isburo fl Iuliola ci Leotio Lego Lesa Lylybeo po Lipari Longo pr	Isburo in foce Iuliola.n. Leontio Lego Lesa Lelybeo Lipara Longo.pro.	Hisporo fi Isburo fi Iuliola ci Leotio Lego Lesa Lilybeo p e ci Lypari Logo pr	Isburo in foce. Iuliola. ci. Leontio. Lego. Lesa. Lilybeo. Lipara. Longo pro. Macarina.	Hisporo flu Isburo flu Iuliola Leontio Lego Lesa Lilybeopmys? Lypari
Macopsisa Mazara Megara Mene Menomeno	Macopsisa Mazaro Megara Mene Menomeno mote	Macopsisa Mazara Megara Mene Menomeno	Macopsisa Macaro fi?? Megara corrected Mene MO MENO MENO	Macopsisa. Mazara. Megara. Mene. Menomeno.	Macopsisa Magara fl? Mene
Messena Mile Molibode isola Monale infoce Moticano infoce	Mesinaci Myle Melibode isola Monalo fl Moticano fl	Messena Myle Molibode isola Monalo in foce Motychano in foce	Mesonaci Myle Molibonde isola Monalo fi Fi montycano	Messena. Myle. Molibode isola. Monalo in foce. Motychano infoce.	Messana Myle Molibode Monalo flu Motyca fl
Motuca Neapoli Necto Nymphea Nympheo porto Nora. ci. Odysiera pro Olbia. ci. Olbiano porto Oluli Orino in foce Oseapoli Osteodi Pachinno. pro. Phalacro Paconia isola Pachia Panormo Pantacho infoce Patioro Peloro pro. Petra Pintia Phitoni isola Phenicode isola Pheronia	Motuca Neapoli Hedto? Nymphea isola Hypheo por Horacitta?? Odysella por Olbian Olbiano poto? Holuli Orino fl Osea ci Osteode isla Pachino por Paconia Pachia p Panormo Pataco fl Pacioro Peloro promoy? Petra Phintone isola Phenicode Pheroni ci	Motuca Neapoli Neeto Nymphea Nympheo porto Nora:ci: Odysiera pro Olbia.ci. Olbiano porto Oluli Orino in foce Oseapoli Osteode Pachinno.pro. Phalacro Paconia isola Pachia Panormo Pantacho in foce Patioro Peloro pro. Petra Pintia Phitoni isola Phenicode isola Pheronia	Motuca Neapoli Necto Nymphea isola Nypheo por Nora ci Obysseia por Olbianaci Olbian po Holuli Fi oreno Osea ci Osteode isola Pachyno p Phalacri ci p Paconia Pachia pmi Panormo Pataco fi Patioro Peloro prom Petra Phintone isola Phinicode Pheroniaci	Motuca. Neapoli. Neeto. Nymphea. Nympheo porto. Nora ci. Odysseia prom. Olbia. ci. Olbiano porto. Oluli. Orino in foce: Oseapoli. Osteode. Pachino prom. Phalachrio. Paconia isola. Pachia. Panormo. Pantacho in foce: Patioro. Peloro prom. Petra. Pintia. Phitoni isola. Phenicode isola. Pheronia.	Motuca Neapoli Necto Nyphea Nypheo porto Nora ci Odysse? Olbian pot Holuli Orino fiume Osea ci Osteode Pachymo Phalacri pmonty? Paconia Pachia promy? Panormo Pantaco fiume Patioro Pelor promy? Petra Phitone Phenicode Pheronia ci

MILAN AC.XIV.44 MANUSCRIPT GAZETTEER	MILAN AC.XIV.44 MANUSCRIPT MAP	PARIS C 2035 9 PRINTED EDITION GAZETTEER	PARIS C 2035 9 PRINTED EDITION MAP	VATICAN Urb.lat.273 MANUSCRIPT GAZETTEER	VATICAN Urb.lat.273 MANUSCRIPT MAP
Pepupulo. ci. Phicaria Phorbantia Preche	Pupulo Phicaria isola Opbatia Lito ul pseche ul pche	Pepulo.ci. Phicaria Phorbantia Preche	Pupulo ci Phicaria isola Phorbatia Lito L pseche L pcie	Pupulo ci. Phicaria. Phorbantia. Preche.	Pupulo ci Phicaria Phobartia Lito pche??
Phthinthia Plumbio. ci. Punico porto	Phthinthia Plubio ci Phenice por	Phthinthia Plumbio.ci. Punico porto	Phthinthia Plubio ci Phenice po	Phthinthia. Plumbio ci. Phenico uel punico porto.	Phthinthia Plubio Phenice
Sacra isola Sacro in foce Saratapi Sardopatoro	Sacra Sacro fl Saratapi Sardopatoro sacro	Sacra isola Sacro in foce Saratapi Sardopatoro	Sacra Sacro fi Saratapi Sardopatoro sacr	Sacra isola. Sacro in foce. Saratapi. Sardopatoro.	Sacra Sacro flu Sardopatoro
Sichera Selenime infoce Senesta Sepro infoce Sergentio Sipicio Syracuse col. Symetho infoce Solesporto	Schera Selenunto fl Segesta twice Sepro fl Sergetio Sypicio poto Siracuse col Symetho fl Solci poto Solci ci	Sichera Selenunte in foce Senesta Sepro in foce Sergentio Sypicio Syracuse col. Symetho in foce Soles porto	Schera Selenunto fi Segesta twice Sepro fi Sergentio Sypicio porto Syracuse col Symetho fi Solci por Solci ci	Schera. Selenunte infoce. Senesta. Sepro in foce. Sergentio. Sypicio. Syracuse col. Simetho infoce. Solei porto.	Schera Selenuto fl Segesta twice Sepro fiume Segetio Sypicio poto Syracuse Symetho fl Solci port Solci ci
Sossio infoce Strongyle isola Susaleo uilla Tarre.ci. Tauromenio Tauro Temo in foce Therme himere Tibula.ci. Tilio ci Thimetho in foce Tyndario Tissa Thyrso infoce Torrebyssone.ci. Triocla Valeria Uselipoli Ustica isola Vulcania isola	Sossio fl Strogile isula Susaleo uilla Tarre.ci Tauromena Tauro po Temo fl Theme himere Tibula ci Tilio ci Tinetho fl Tindario Tissa Thyrso fl Tore di bissoe ci Triocla Valeria Uselipoli ci Ustica isola	Sossio in foce Strongyle isola Susaleo uilla Tarre.ci. Tauromenio Tauro Temo in foce Therme himere Tibula.ci. Tilio.ci: Timetho in foce Tyndario Tissa Thyrso in foce Torrebyssone.ci. Triocla Valeria Uselipoli Ustyca isola Vulcania isola	Sossio fi Strongyle isola Susaleo uil Tarre ci Tauromenio col Tauro p Temo fi Theme himereci Tibulaci Tilio ci Tmetho fi Tyndario Tisa Thyso fi Tore di bissoe ci Trioca Valeria Uselipoli col Isola ustica Vulcano	Sossio in foce. Strongyle isola. Susaleo uilla. Tarre ci. Tauromenio. Tauro. Temo in foce. Theme himere. Tibula ci. Tilio ci. Timetho infoce. Tyndario. Tyssa. Tyrso infoce. Torrebyssone ci. Triocla. Valeria. Uselipoli. Ustyca isola. Vulcania isola.	Sossio flu Strongyle Susaleo uil Torre ci Tauromenio col Tauro pmy? Temo fiume Theme himere Tibula ci Tilio ci Timetho fiue Tissa Thyrso fiume Tore di bissoe Triocla Valeria Uselipoli col Ustica isola Vulcano

8b Applied titles for the larger regions islands and seas on the map

TABVLA SEPTIMA DE EVROPA

in both manuscripts and the printed edition

MILAN AC.XIV.44 MANUSCRIPT MAP	PARIS C 2035 9 PRINTED MAP	VATICAN Urb.lat.273 MANUSCRIPT MAP
PAR DI CORSICA ISOLA CORSY TIBULACY CORACESI COCITANI SALOTANI LUQLONESI ESARONESY CORNESI DECTI ARCHILESI SARDINIA ISOLA RUCESY MISSING CELSITARY SCAPITANI SICULESI NEAPOLITE VALENTY SOLCITANI PARTE DE ITALIA MESSENI ORBITE CATANEI SICILIA ISOLA SYRACUSY SEGESTANI AFRICANO MARE SARDOO PELAGO TUSCO MARE ET TYRRENO ADRIATICO MARE	PAR DI CORSICA ISOLA CORSII TIBULATII CORACESII CUCITANI SALCITANI LUOVIDONENSI ESARONENSII CORNESII DECTI ACHILENSII SARDNIA ISOLA RUCENSII COPICESII CELSITANI ISCAPITANI SICULENSII NEAPOLITE VALETINI SOLCITANI PAR DE ITALIA MESSENA with a I in the A ORBITE CATANEI SICILIA ISOLA SYRACUSII SEGESTANI AFRICANO MARE SARDOO PELAGO TUSCO MARE ET TYRRENO ADRIATICO MARE	PARTE DI CORSICA ISOLA CORSY TIBULATY CORACENSY CUNCITANY SALCITANI LUQDONESY ESARONENSY CORNENSY & ACHILIENSY SARDINIA ISOLA RUCENSY COPICESY CELSITANI SCAPITANI SYCULENSY NEAPOLITE VALENTINI SOLCITANI PARTE DE ITALIA MESSENI ORBITE CATANEI SICILIA ISOLA SYRACUSY SEGESTANI LYBYCO PELAGO SARDOO PELAGO TYRRENO MARE ADRIATICO PELAGO

*9a Applied toponyms in the gazetteers and on the map TABVLA
DVODECIMA D ASIA in both manuscripts and the printed edition*

MILAN AC.XIV.44 MANUSCRIPT GAZETTEER	MILAN AC.XIV.44 MANUSCRIPT MAP	PARIS C 2035 9 PRINTED EDITION GAZETTEER	PARIS C 2035 9 PRINTED EDITION MAP	VATICAN Urb.lat.273 MANUSCRIPT GAZETTEER	VATICAN Urb.lat.273 MANUSCRIPT MAP
Abaratha ci Adisamo Alaba isola Ammina Anarismundo pro. Anubingara. ci.	Adisamo Alaba Ammina Anarismundo prons Anubingara ci and Anubingara Anurogrammo regia Arana Azano. f. Fonte Balaca Baratha ci.pro.	Abaratha.ci. Adisamo Alaba Isola Ammina Anarismundo pro Anubingara cicta	Adisamo Alaba Ammina Anarismundo pmon. Onubigara.ci. and Anubigara Anurogrammo regia Arana Azano Fi Balaca Baratha ci et ex	Abaratha.c. Adisamo Alaba Isola Ammina Anarismundo parte Anubingara.c.	Adisamo Alaba Ammina Anarismudo pmons? Anubingara twice
Anurogrammo Arana Azano. f. Fonte Balaca Baratha ci.pro.	Anurogrammo regia Arana Azano fiume Balaca Baratha ci & ex	Anurogrammo Arana Azano.f. Fonte Balaca Baratha.c.p.	Anurogrammo regia Arana Azano Fi Balaca Baratha ci et ex	Anurogrammo Arana Azano fonte Balaca Baratha.c.parte	Anurogrammo regia Arana Azano fiume Balaca Baratha citta & pms? Baraco fiume
Baraco.f. Fonte Bassa Boreo.pro.	Baraco fiume Bassa Boreo promontorio	Baraco.f. Fonte Bassa Boreo pro.	Baraco Fi Bassa Boreo Prom	Baraco Bassa Boreo parte	Baraco fiume Bassa Boreo pmo
Bocana. ci. Calandadrua Canathra Carco Ceteo. pro.	Bocana citta Caladadrua Canathra Carco Ceteo pms?	Bocana cicta Calandadrua Ganathra Carco Ceteo pro.	Bocana.ci. Caladadrua Canathra Carco Ceteo pmi	Bocana. c. Calandadrua Canathra Carco Ceteo parte o placed above p and arte crossed out	Bocana citta Calandadrua Canathra Carco Ceteo pmons?
Corcobara.ci. Dagana.ci.sa	Cocobara ci Dagana sacra luna	Corcobara.ci. Dagana.ci.sa	Corcobara.ci. Dagana sacraaluna	Corcobara.c. Dagana.c. sacra crossed out and sacra luna added	Corcobara citta Dagana sacra luna
Dionisioo di ba	Citta didionysie	Dionisio o di ba	.Ci.Didionysio	Diomysio ioi diba i i crossed out, co placed above a, echo.c added and crossed out	Citta di Dionysio
Egidion Enancra Galiba extrema Gange.f.qui dr.	Egidio i placed above the o Galiba extrema Gange flu	Egidion Enancra Galiba exrema Gange.f.qui dr	Egidio Galiba extrema Gango Fi E placed above the O	Egidion Enancra Galiba extrema Gange.qui dr.izg	Egidio isot Galiba exma Gange fiume
Fonte		Fonte		Fonte malea	

MILAN AC.XIV.44 MANUSCRIPT GAZETTEER	MILAN AC.XIV.44 MANUSCRIPT MAP	PARIS C 2035 9 PRINTED EDITION GAZETTEER	PARIS C 2035 9 PRINTED EDITION MAP	VATICAN Urb.lat.273 MANUSCRIPT GAZETTEER	VATICAN Urb.lat.273 MANUSCRIPT MAP
Cumara Iogana.ci. Ioue extrema	Gumara Iongana ci Extremira di giove	Gumara Iogana.ci. Ioue extrema	Gana Gumara Iongana.ci. Extremita digiove	Gumara Iogana.c. Ioue extrema	Gumara Iongana citta Extremita di giove
Irona Lito magno Maagrammo	Irena Lito mago Maagrano metpli	Irena Lito magno Maagrammo	Irena Lito Magio Magramo Mepli	Irena Lito magno Maagramo	Irena Lito mago Maagramo metpoli
Margana cicta	Margana citta	Margana cicta	Margana.ci R engraved on top of A	Margana.c.	Margana citta
Mocucto emp. Monaca Mordula pro. Necaduma Nagadiba isola Nagadiba.ci. Nubartha ci Odoca ci Orneon extrema Orneon Oxia pro. Phali.f. Fonte Parisenno Phelico Poduca Prasode seno Priapo porto Procuri cicta	Modetto empors Monacha Mordula portus Necaduma Nagadi??? Nagadiba ci Nubartha ci Hodoca ci Orneo exma Orneo Ox? omi?? Phasi flu Pari seno Phelico Poduca Praso de golfo Porto di priapo Procuri a i prom	Moducto emp. Monaca Mordule pro. Necaduma Nagadiba isola Nagadiba cicta Nubartha cicta Odoca cicta Orneon extrema Orneon Oxia pro. Phafi.f. Fonte Pari seno Phelico Poduca Prasode seno Priapo porto Procuri cicta	Modoto.epori. Monaca Modula potus Necaduma Nagadiba Nagadiba ci. Nubartha.ci. Hodoca.ci. Orneo extrea Orneo Oxia pmi Phasi fi Patiseno Phelico Prasode golfo Porto di priapo Procuri.ci.epm	Modutto.emp. Monacha Mordulc. parte. Necaduma Nagadiba isola Nubartha c. Hodoca c. Orneon extrema Orneon Oxia parte Phafi Patiseno Phieleco Poduca Prasodeseno Pirapo porto Procuri.c.	Modetto emporio Monacha Mordula porto Necaduma Nagadiba Nagadiba Nubartha citta Odoca citta Orneo exma Orne isola Oxia pmt? Phasi fiume Patiseno Phelico Poduca Prasode seno Porto di priapo Procuri citta mprmonts? Rizala poto Sindoca da citta Soana flume Porto del sole Spatare poto Susuara Talacory emporio Uangana Ulispada Zaba Zibala
Rhizala Sindocanda cicta Soana infoce Fonte Sole porto Spatana pro. Susuara Talachori emporio Uaugana Ulispada Zaba Zibala	Rizala porto? Sindocada citta Soana flume Porto del sole Spataro por Susuara Talachori emprs? Uangana Ulispada Zaba Ribala	Rhizala Sindocanda cicta Soana in foce Fonte Soleporto Spatana pro Susuara Talachori emporio Uaugana Ulispada Zaba Zibala	Rizala por Sindocada ci Soana fi Po Delsole Spatarae por. Susuara Talachory Empri Uangana Ulispada Zaba Zibala	Rhizala parte Sindocanda.c. Soana in foce Fonte Soleporto Spatara .parte. Susuara Talachory emp. Uangana Ulispada Zaba Zibala	Rizala poto Sindoca da citta Soana flume Porto del sole Spatare poto Susuara Talachory emporio Uangana Ulispada Zaba Zibala

9b Applied titles for the larger regions islands and seas on the map

TABVLA DVODECIMA D ASIA

in both manuscripts and the printed edition

MILAN AC.XIV.44 MANUSCRIPT MAP	PARIS C 2035 9 PRINTED MAP	VATICAN Urb.lat.273 MANUSCRIPT MAP
PAR DE INDIA DENTRO AL GANGE	PAR DE INDIA DENTRO AL GANGE	PARTE DE INDIA DENTRO AL GANGE
GALIBI	GALIBI	GALIBI
MODUNTI	MODUTI	MODUNTI
ANUROGRAM	ANUROGRAMI	ANUROGRAMMI
NANAGADIBI	NANAGADIBI	HANAGADIBI
SOANI	SOANI	SOANI
MISSING	SENNI	SENNI
GALIBI MONTI	GALIBI MONTI	GALIBI MONTI
SANDOCANE	SADOCANE	SANDOCANE
TAPROBANE ISOLA	TAPROBANE ISOLA	TAPROBANE ISOLA
BUMASANJ	BUMASANI	BUMASANI
TARACHI	TARACHI	TARACHI
BOCANI	BOGANI	BOCANI
MORDULI	MORDULI	MORDULJ
MALEA MONTE	MALEA MONTE	MALEA MONTE
ROGANDONI	RHOGATIDANI TI corrected into N	RHOGANDANI
PASTURA DELLI HELLEPHANTI	PASTURA DELLI HELEPHATI	PASTURIE DE HELEPHANTI
NANIGERI	NANIGERI	NANIGERI
????CO MARE	INDICO MARE	INDICO MARE

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Despite this atlas having been researched by multiple scholars in the past, several hitherto unanswered questions remained. These prompted our research. Over the past five years, we have studied more than 40 extant copies in Europe. In this book we unveil most of the previously unsolved issues, show the paper use in Tedescho's printing office and display the watermarks found in the paper. In addition, we describe new findings such as the existence of proofs, multiple states of almost every map in the atlas, and the method of production of the manuscripts and their relation to the printed edition.

Frans Laurentius (* 1971) has been active as an art historian and art dealer since 1998. His main interests are prints and drawings. He has been engaged in paper- and watermark research for over 25 years. In 1998 he attained the title of master in the arts with a catalogue and biography concerning the artist-family Janson from Leiden. In 2007 and 2008 he published two large catalogues of watermarks from the Zeeland Archives. In 2010 he finished a PhD research at the University of Utrecht concerning the print publisher Clement de Jonghe. Next to these activities he has been active in archeological projects and research into the material culture in the Netherlands between 1550 and 1850.

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