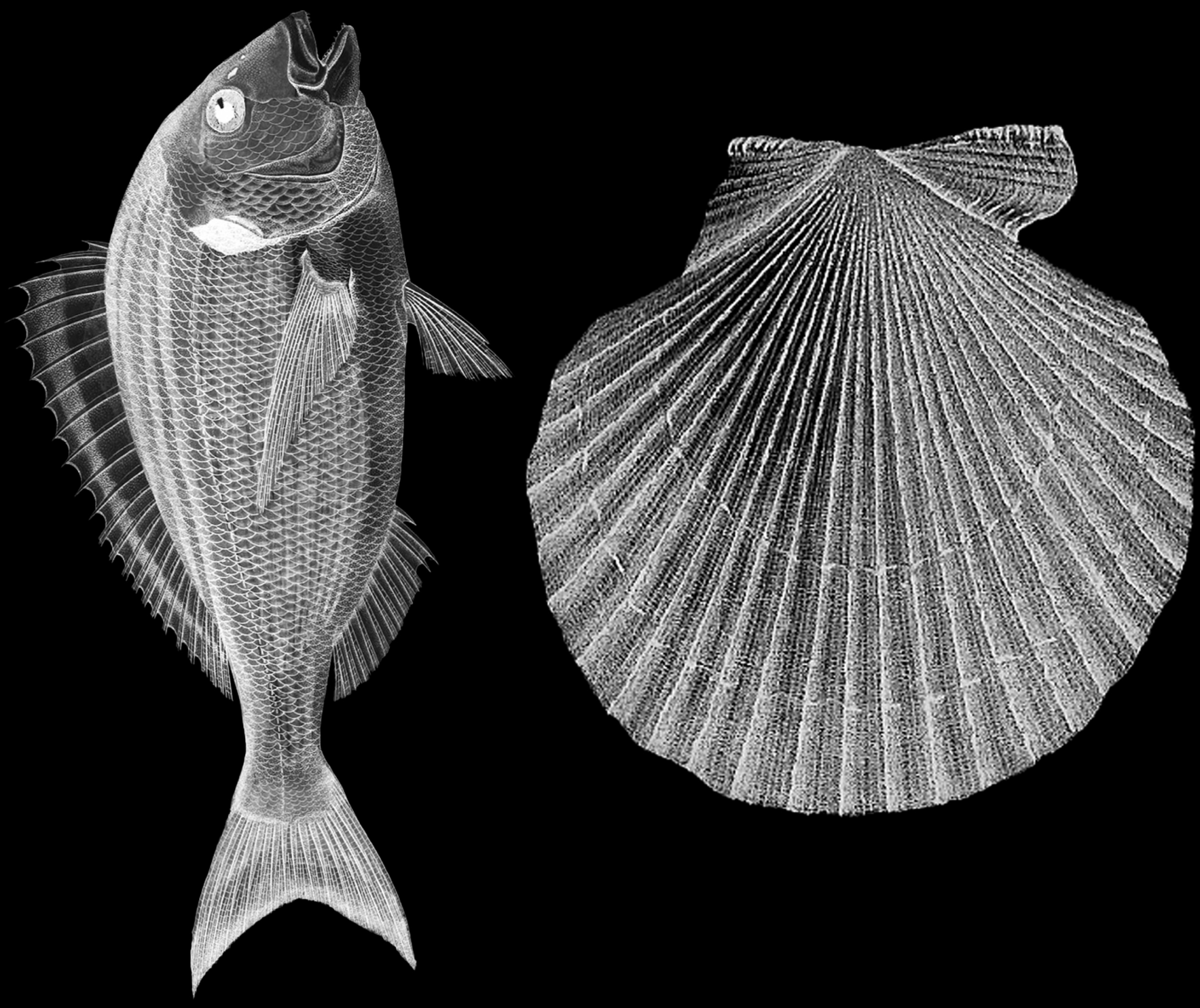
On Reality.

The *appearance* of the city in the maps of Venice and Amsterdam



Rocco Lucio Piantelli

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Aequipecten opercularis (right valve). From "*Wikimedia Commons*", by Nyst, 1878

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On Reality.

The *appearance* of the city in the maps of Venice and Amsterdam

AR2A011 Architectural History Thesis
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Abstract

This thesis examines the complex relationship between *reality* and *representation* in maps, and how this relation has influenced the perception of the map and its ability to convey information throughout history. The study analyses historical maps of Venice and Amsterdam, highlighting their evolution from detailed depictions to simplified representations. Through philosophical theories and cartographic investigations, it reveals the paradoxical nature of map truthfulness, where distortion often becomes a means of communication. From the mythical portrayals of the historical city to the modern diagrammatic transit maps, this thesis traces the progress of cartography, examining how maps balance accuracy with purpose, ultimately prioritising coherence over correspondence with reality.

It is not down in any map true places never are.

from *Moby Dick* (1851)
Herman Melville

Contents

0.

Introduction

...In that Empire, the Art of Cartography attained such Perfection that the map of a single Province occupied the entirety of a City, and the map of the Empire, the entirety of a Province. In time, those Unconscionable Maps no longer satisfied, and the Cartographers Guilds struck a Map of the Empire whose size was that of the Empire, and which coincided point for point with it. The following Generations, who were not so fond of the Study of Cartography as their Forebears had been, saw that that vast map was Useless, and not without some Pitilessness was it, that they delivered it up to the Inclemencies of Sun and Winters. In the Deserts of the West, still today, there are Tattered Ruins of that Map, inhabited by Animals and Beggars; in all the Land there is no other Relic of the Disciplines of Geography.

from *Travels of the Preisworthy Men* (1658)
by J. A. Suàrez Miranda

(Borges, 1975)

Maps fascinate us because they tell us stories. The oldest ones tell of researches, conquests, and discoveries. Therefore, maps also tell us a lot about our history, as they have always been an integral part

of human societies (Garfield, 2012). Although the first physical evidence of a map dates back 14,000 years, British ethologist Richard Dawkins claims that our ancestors drew maps in the sand much earlier. Before the invention of writing, maps were a basic tool of communication alongside primitive forms of language and gestures. As Baricco (2017) suggests, a map is itself a gesture: it represents the human instinct of putting in order what we have understood of the world. We organize our knowledge not only for ourselves but mainly to share it with others. A map is indeed a powerful means of exchanging information. However, in order to be efficient, a map must relate to reality and truth. But how can we decide if a map is true?

Before trying to answer the question, brief considerations regarding the problem of the definition of truth are needed. As Lynch (2001) points out, the nature of truth is complex and mysterious. There are three main reasons for the ambiguity of the word *truth*. First, truth is a basic concept: it is not possible to argue over a theory of truth without using the concept of truth because to question a theory is to question its truth. Secondly, truth is closely related to belief and another mysterious concept such as reality. Finally, truth does not depend on us, but on the world.

In the history of philosophy, there have been countless attempts to find a convincing definition of the concept of truth. Of the most recent efforts, this thesis will be guided by Bertrand Russel's argumentation on the subject. Russel's definition refers directly to the *correspondence theory of truth*, which derives from Aristotle's statement: "Truth is correspondence with reality".

In Russel's words: "Truth consists in some form of correspondence between belief and fact". Truth therefore embraces the concept of coherence, while the hallmark of falsehood is the lack of coherence in the totality of our beliefs. However, Russel also emphasizes that "there is no reason to suppose that only one coherent body of beliefs is possible" and that "coherence cannot be accepted as giving the meaning of truth but just as a test of truth". Moreover, correspondence with the fact as constituting the nature of truth establishes a direct relation between a belief and a fact, but this relation may also require more than two or three terms.

We will therefore assume that "a belief is true when it corresponds to

a certain associated complex, and false when it does not".

This theory of truth encounters a fundamental difficulty in its application to the field of cartography. Suppose the truth of a map is laid in the *perfect correspondence* between reality and its representation, a map designed according to this principle would have the same size as the area it depicts. However, such a map would be impossible to realize. In his essay 'Dell'impossibilità di costruire la carta dell'Impero 1 a 1', Umberto Eco (1992) undertakes a logical analysis of the paradox of "The Map of the Empire" proposed by Borges (1975).

Five essential requirements for a map in scale 1:1 are set as the base for the analysis:

1) The map is the same dimension as the territory of the empire
2) The map is a map (a two-dimensional drawing) and not a cast
3) The map is produced and spread in the same empire it represents
4) The map is faithful and also represents artifacts and the totality of subjects
5) The map is a map and not an atlas divided into sheets

Following these rules, Eco investigates three different possibilities for the production of the map, explaining the contradictions arising from each experiment.

In the case of an opaque map spread over the territory, not only does the perception of the map preclude the simultaneous perception of the territory, but the presence of the map itself alters the ecological balance of the territory it covers, so that the map represents the territory differently than it is. The map would then have to be subject to constant correction, but this is not possible due to the opacity of the map, which makes correction impossible. Furthermore, if the map had to represent the inhabitants, it would be wrong because it would represent a territory with inhabitants who inhabit the map and not the territory.

To avoid this last contradiction, the map could be suspended. However, such a map would be useless because to consult a portion of the map, one would have to stand directly underneath it, which means that the map could not provide any information about parts other than the one being consulted. As with the previous option, the problem of variability of the territory would also arise with this alternative. Lastly,

if the map were to be corrected, the subjects would need to constantly move under it so the map would be constantly false as it would not represent the subjects themselves.

The previous reflections would lead to considering as the best solution a transparent, permeable, and orientable map. Nevertheless, this possibility also presents some incongruities. In fact, after drawing the map, the subjects would be either lying under the map or standing over it: in the first option, the inhabitants could not move in order not to alter their position on the map; in the second, the map would represent a territory inhabited by subjects who inhabit the map. Additionally, if the map was to be consultable by everyone, it would need to be foldable and orientable. Not only would this condition set a series of strict features to the territory (a regular geometry since the map cannot exceed the borders of the Empire, the presence of a central point and a space in the centre where to fold the map), but when folded the map would be unconsultable and falsely represent the territory, since it would represent a territory without a folded map in it.

After all, the whole paradox is characterized by the following contradiction: since a map in scale1:1 covers the entire territory it represents, the territory is characterized by the presence of a map over it, a piece of information that the map itself does not convey. To overcome this issue another overlapping map would be needed, but this consideration would lead to an infinite process.

Three corollaries derive from Eco's conclusion: each 1:1 map always represents the territory unfaithfully; when the map is realized, the Empire becomes unrepresentable; each 1:1 map of the Empire marks the end of the Empire as such, so it is a map of a territory and not a map of the Empire.

Perfect correspondence between representation and reality in a map is therefore impossible, not truthful, and, most importantly, useless. We have already discussed the connotation of each map as an *action* (the human instinct to give an order to what we know). Each map is also a *selection*: to convey a clear message it cannot represent everything, but it selects only the significant elements. Finally, each map is an *interpretation*: a map portrays according to what it wants to show and consequently convey.

Taking into consideration that every map is a well-balanced combination of the existing features of a city and adjustments that are made to achieve the information purpose the map has, this paper aims to answer the following questions: What is the relationship between *reality* and *appearance* (truth and falsehood) in a map? And how does this relationship impact the *perception* of the map and the information it conveys?

The research will involve a comparison of historical maps depicting the cities of Venice and Amsterdam during different centuries and through various graphical representations. The analogy between the two cities has distant origins: Havard (1887) claims that Amsterdam has always been defined as the "Venice of the North" due to both urban and cultural similarities. Both cities are located in a gulf and "comprised of a myriad of islands, linked by countless bridges over innumerable watercourses" (Feeds, 2015). During their history, Amsterdam and Venice reached prosperity and notoriety because of maritime trade, relying on their navy better than anything else. As for politics, they were both governed by a patrician bourgeoisie in love with their independence in a republican system: therefore both cities are still characterized by a thoughtful but unyielding patriotism (Havard, 1887). Finally, and most importantly for this thesis, Amsterdam and Venice were both rising centres of typographical science and map-making.

1.

The *imago urbis*

The history of humanity progresses gradually over time. Our culture evolves through small but continuous changes that contribute to its development. However, there are instances when this gradual movement takes a sudden and unpredictable leap forward all at once. Baricco (2013) defines these episodes as 'rips'.
The crucial 'rip' in the history of cartography is marked by a specific date: 1500 or, in Roman numerals, 'M.D.' - the same letters in the original title of Jacopo de Barbari's perspective view of Venice - *Venetie. M.D.*
This map distinguishes two eras of the image of the European city in history, as it transitioned from a mythical and utopian representation of the urban environment to a vibrant and living city. The view is considered unique because unprecedented, both in the drawing method as well in the level of detailing in which the urban fabric is depicted. Not only did de Barbari's work contribute significantly to giving Venice its image[1], but it also made Venice the symbol of the European city in transformation and mutated the relationship city-landscape in urban representations (Romanelli,1999), as it will bw later explained.

Nuti (1999) believes that there are only a few products from that period in Europe capable of dialoguing with this prototype. The one that comes closet to it is Cornelis Anthonisz's *Map of Amsterdam* printed in

1. Before de Barbari's view, only one complete map of Venice existed, drawn by Fra' Paolino in the XIV century.

1544. The multiple similitudes in terms of graphical representation and symbolic references that intercourse between the two views give enough reasons to believe that Anthonisz must have known de Barbari's work (Hameleers, 2015). Comparing cities was a popular way to accentuate their characteristics during that time (Bakker, Schmitz 2007). Venice was a perfect fit for this purpose, as it was depicted as a maritime power that communicated both internally (through Canal Grande) and with the world (through Piazza San Marco). Anthonisz consciously capitalized on this similarity in his representation of Amsterdam, which is also shown as a maritime power, connected to the world through IJ internally through the Amstel.

Purposes and commissions

Before analysing the drawing techniques and representation strategies of the two views, it is worth understanding the purposes for which they were created. To begin with, it's important to mention that both maps are xylographies, i.e. they were created by engraving wooden plates. This technique allowed the maps to be printed in countless copies so that the image of the cities could be spread potentially across the whole world. This feature already suggests that the two works were meant to be representative, which is confirmed by the fact that both maps were commissioned by political figures of the respective cities.

De Barbari's view is to be considered as part of several initiatives that the authorities focused on to restore the image of 'la Serenissima' as a powerful maritime city during the difficult moment at the start of the century when the Turks had control of the Mediterranean, and the influence of Venice was therefore limited (Cacciari, 1999). The work behind the realization of the drawing was organized and financed by the rich German merchant Anton Kolb, who acted as the map editor in agreement with the Venetian Senate. Besides this information, little is known about the number of professional figures implied in the venture. It is still debated whether Barbari himself was a woodcutter, or if he simply drew the details on the six woodblocks that compose the map to be then executed by specialist woodcutters from Nuremberg, as German philosophy historian Paul Oskar Kristeller suggests (Howard, 1993). However, it can be said with a good amount of certainty that the huge sizes (134,5x282 cm) and the cost of three ducats[2] made the map a luxury item, destined for serious collectors.

The history of Anthonisz's drawing is more complex. Not only did the map have five subsequent different versions[3], but also a previous one realized as a coloured painting in 1538. As Bakker and Schmitz (2007) report, this earlier version, which is to be considered the first monumental city portrait of Amsterdam, was commissioned by the city council to honour Emperor Charles V. However, the painting never reached him and the panel was given a place in the town hall. The realization of this portrait was probably intended as a symbolic gesture, in which the city humbly presented itself to the ruler. Unlike the painting, Anthonisz made his printed map in 1544 at his own risk (Hameleers, 2015), divided into twelve wooden blocks. As a demonstration, the author takes pride in his private initiative calling himself a 'painter' in the map inscription.[4] Moreover, the xylography version of the view was not only intended to give an impressive portrait of Amsterdam but at the same time provide a reliable guide for residents and visitors. Anthonisz demonstrates his understanding of the communicational power of maps by simplifying in the urban structure the complexity that characterizes de Barbari's bird ' s-eye perspective to make the drawing easier to read. However, he certainly did not neglect the representative aspect of the woodcut. In the print, he emphasizes this aspect even more compared to the painting, especially in the representation of the coat of arms and the name of the city held up by the sea god Neptune, unlike in the previous version where they are represented as floating elements.

Construction of the drawings

The two maps are drawn as perspective plans, a drawing technique that combines the exactness of the geometry in the plan relief (*ratio geometrica*) and the deepness of the perspective vision in elevation constructions (*ratio perspectiva*) (Nuti, 1999). Simply put, the maps are a composition of plans and perspectives. However, when considering the views chosen by de Barbari and Anthonisz to represent Venice and

2. The ducat was a gold coin, first issued in 1284 by Doge Giovanni Dandolo (1280-1288). It later took the name of zecchino. The gold ducat of Venice was worth 2 Venetian lire and 8 sous. The coin was issued until the fall of the Republic (Wikipedia, 2024 A).

3. The map was printed in five other different versions after the first from 1544. Those were respectively edited in 1544-1545, 1545-1553, ca. 1557, 1157-1636 and 1636-1637. The six maps differ only in the letterings, precisely in the style of the capital D. (Hameleers, 2015).

4. 'Dese Afbeeldinghe vindtem te koop in die vermaerde koopstadt van Amstelredam acther die Nieuwe Kerck by den voorsz Cornelis Antoniszoon, Schilder inde Schrijvende handt'.

Amsterdam, an elementary question arises: How could they do that? This question takes into consideration two contradictions that emerge from a brief geographical analysis. First of all, the two artists never saw the cities from the point of view they used. Indeed, to depict the cities as opened to the world, both maps are drawn from the sea, as de Barbari and Anthonisz were standing on top of two imaginary mountains that do not exist in reality. Morover, the level of detail shown in the map is incompatible with the distance from which they are drawn. As Hameleers (2015) reports, in 1946 Wiessner concluded that if Cornelis Anthonisz had wanted to see the horizon at the angle he used, he would have had to move to a drawing height of no less than 3,790 meters. At that height, it would be impossible for any human being to see the individual buildings with the drawn details. Therefore, to draw such 'invisible' views, the artists relied on other elements rather than a direct visual experience.

There are no doubts that de Barbari was a man of great culture, well inserted in the cultural European panorama of the late XV century. His knowledge of the art of xylography and printing is proven by a documented relation between the artist and the city of Nuremberg and the meeting with the German painter Albrecht Dürer in 1494, to whom he was presented by Kolb (Falchetta, 1999). Jacopo was familiar with spheric trigonometry and may have used Pacioli's *Summa de arithmetica, geometria, proportioni et proportionalità*[5] as a reference. There is no certainty about the working method that de Barbari used since no sketches from the author nor preparation drawings are left. However, it is reasonable that the map was built as a composition of particular sights, as the view isn't one central projection but rather a sum of particular projections. The main supporter of this theory is the architectural historian Juergen Schultz who, in his book *Printed Plans and Panoramic Views of Venice* from 1970, convincingly concluded that the map was a composite of detailed images taken from various campanili, after meticulous studies of their positions. Therefore, we can consider *Venetie. M.D.* as a map constructed through a balanced mixture of theory and practice.

In contrast, Anthonisz's construction work of the view appears simpler, not only because of the presence of a previous map (his pain-

5. Jacopo de Barbari portrayed Pacioli in his painting Doppio Ritratto from 1495.

ting from 1538) but also because he chose a higher point of view (fig. 1). This vision significantly facilitates the drawing since the building blocks can be positioned in the boundaries of the blocks without altering the road texture in the plan. Anthonisz's map does indeed suggest that the author has conceived the drawing based on a brief plan filled in its intermediate parts using sketches made from towers, just like de Barbari.

Unlike Venice, where the perspective representation is characterized by a homogenous level of detailing, the urban fabric of Amsterdam is depicted from an isometric perspective and suffers evident differences in the accuracy of the architecture. Indeed, the main city buildings including churches and monasteries[6] are represented in detail comparable to de Barbari's map. They are also slightly bigger in scale to be easily identified and their name is always mentioned, while most street names are missing (Hameleers, 2015). On the other side, common houses are treated as simpler compositions, characterized by blocks in repetition with a generally lower and variable level of detail, depending on the angle of the façade. However, Anthonisz shows an appreciable study of sun exposition, representing the shadows on the shaded elevations, as well as a precise update of the urban changes that occurred in the city since his painting from 1538.

Both maps also share a fine composition in terms of geometrical shapes and elements. The view of Amsterdam fits in an almost perfect square with dimensions of 107,2x110 cm, underlined by a thick black frame with continuous and repetitive decorations. The drawing is constructed on the two diagonals of the square: the longitudinal development of the city from the bottom right corner to the top left is contrasted with the important presence of the inscription and the god Neptune in the top right corner (fig. 2). Once again, de Barbari's view shows a higher level of complexity. Venice is inscribed in an elliptical shape defined by the uncommon presence[7] of eight heads, which represents the eight winds blowing on the city. This circularity of

6. This choice can be explained because Anthonisz his map was made before the Alteration of 1578, the year in which the Catholic city council was deposed. Until that point, the church and monastic orders had a significant influence in the city. However, after 1578, the Catholics lost their power, and the monasteries underwent significant changes, such as renovation, repurposing, or demolition. Moreover, Cornelis Anthonisz had studied to become a priest himself despite never receiving the orders (Hameleers, 2015).

7. The representation of winds as heads was commonly used to give geographical indications on globes, not in "artistic views" (Falchetta, 1999).

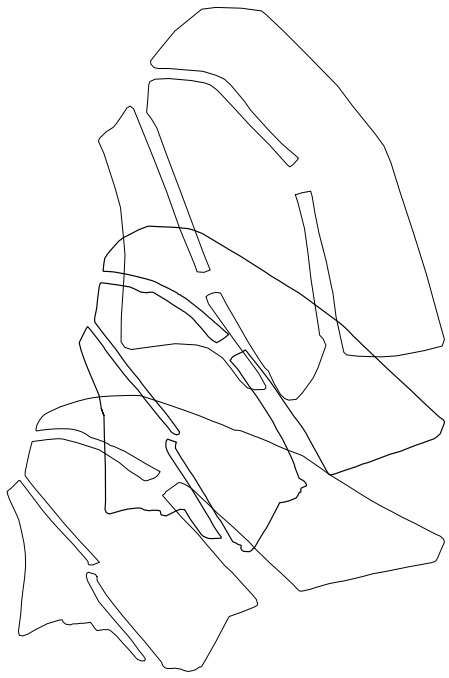

Fig. 1

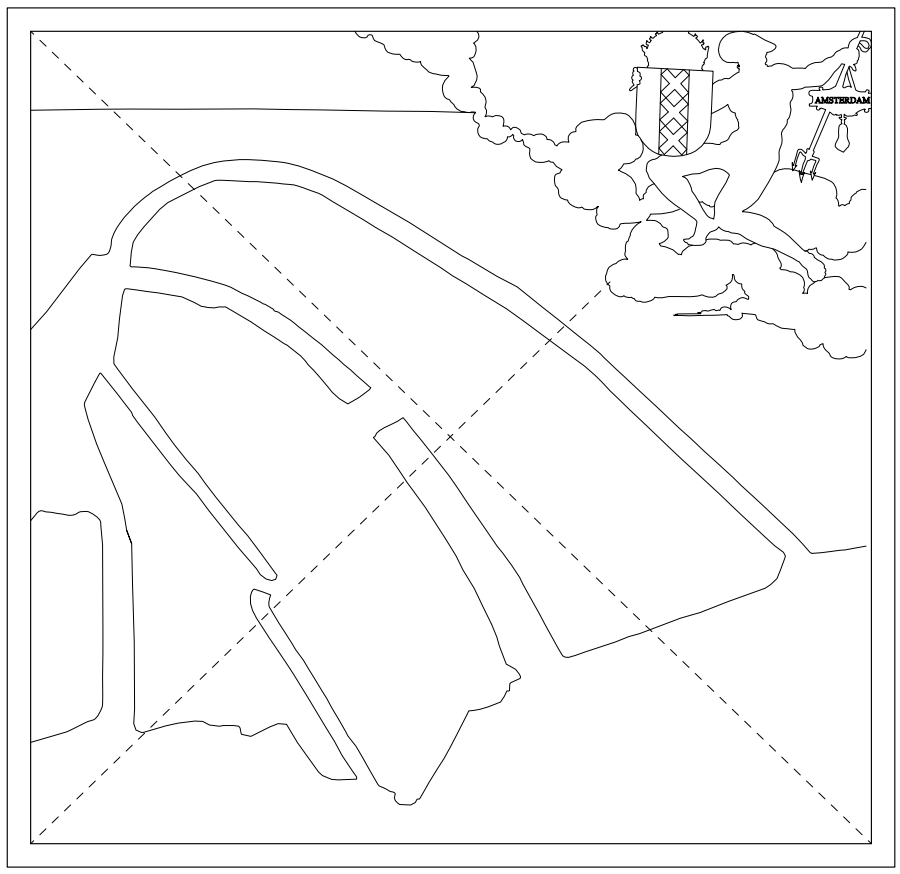

Fig. 2

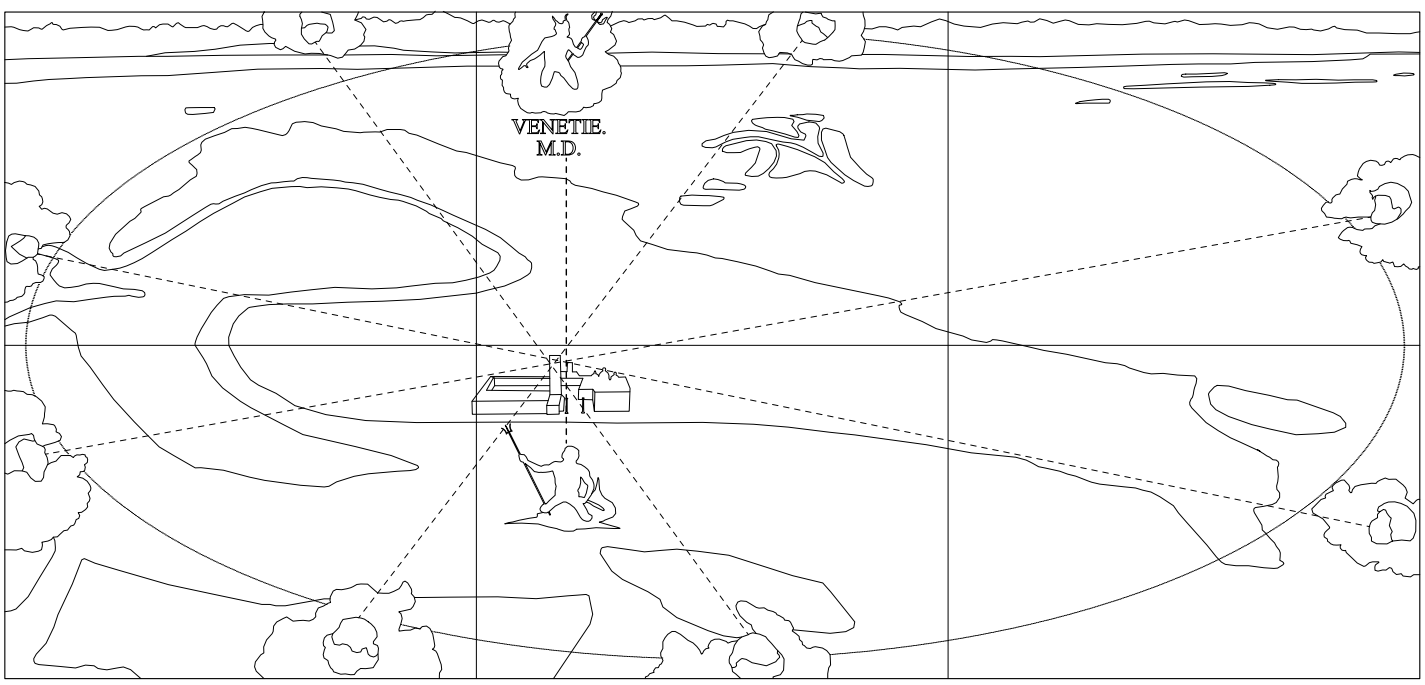

Fig. 3

Fig. 1 Comparison between the point of view of Anthonisz's map from 1544 (in the middle), the previous version from 1538 and a plan of Amsterdam as in 1544.

Fig. 2 Diagram showing Anthonisz's map composition based on the balancing of elements on the square diagonals.

Fig. 3. Diagram showing de Barbari's map composition, higliting the main axis of the drawig, the lines onnecting the eight winds and merging in the tower of San Marco, and the ellipses in which Venice can be inscribed.

the *forma urbis* represents its perfection (Masciantonio, 1999). The radiant system has as its central point the tower of San Marco, which is also centred longitudinally. Piazza San Marco is also part of the vertical axis which can be drawn from the two gods protecting the city – Mercury and Neptun (fig. 3). This imaginary line looks like a graphic strategy to give a balance to the complexity of the representation, a way of making the view easier to read, and also an occasion to state its nature through symbols as a celebration (Romanelli, 1999).

Distortions: the city and the landscape

The detailed appearance of the two maps hides a consistent number of distortions. These alterations to the urban geography become more apparent when a grid is overlaid on the drawings. Through this method, Schultz was able to identify the main area of distortion on the left side of Venice, whereas on the right half the grid is more accurate (fig. 4-6). This relation of compression and dilatation is also suggested by the vertical axis of the drawing, which strangely does not correspond with the median of the long side of the map. Different experts have given different explanations for this imperfection. Schulz suggests the artist started from the East and simply ran out of space when he reached the West. Given the expense and time involved in the whole production exercise, de Barbari could do nothing but accept his mistake. Masciantonio (1999) argues that the artist was conscious of this distortion; in his view, the alteration has to deal with the fact that the West side of the city needed more detailing as it is richer but also that de Barbari didn't want to extend the view too much. Therefore, the surface of Venice is treated as a spoon: plain and narrow in the east wider and curved in the West. All the imperfections of the drawing are however dissimulated by a wise balancing of voids and build.

A similar study has been carried out for Anthonisz's view: georeferencing his map through twelve points and confronting the result with a modern plan of Amsterdam (fig. 5-7), it becomes evident how the waterfront the city facing the IJ is significantly dilated and more broadly defined (Bakker, Schmitz, 2007), as if the artist wanted to give it extra attention. In the literature, Anthonisz's map is usually assigned a scale of approximately 1:1,700 but with several exceptions across the drawing; those changes in scale must have been intended to transform the planar view which served as a basis into a perspective image.

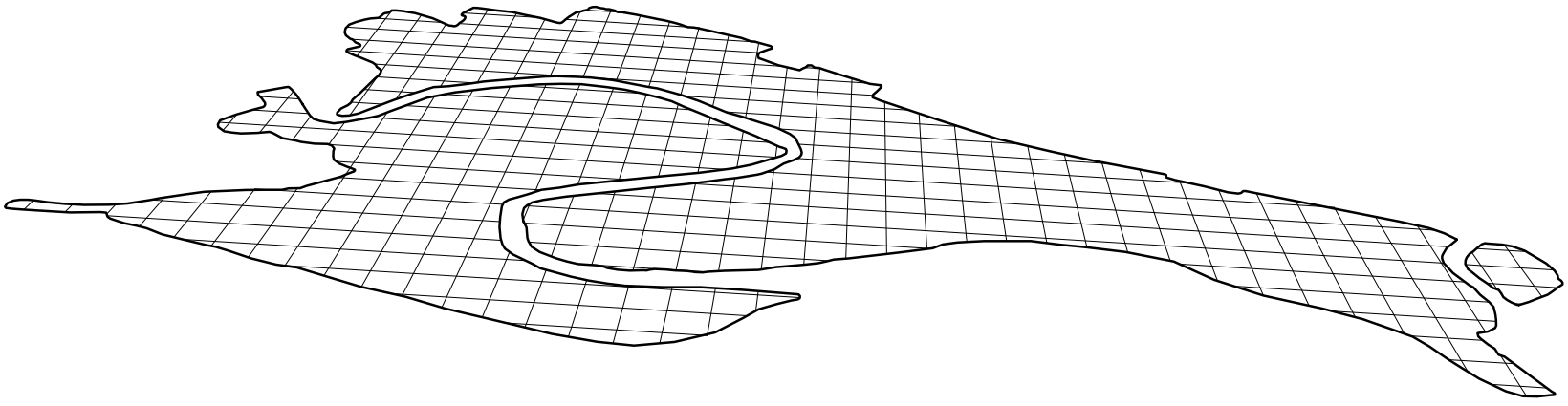

Fig. 4

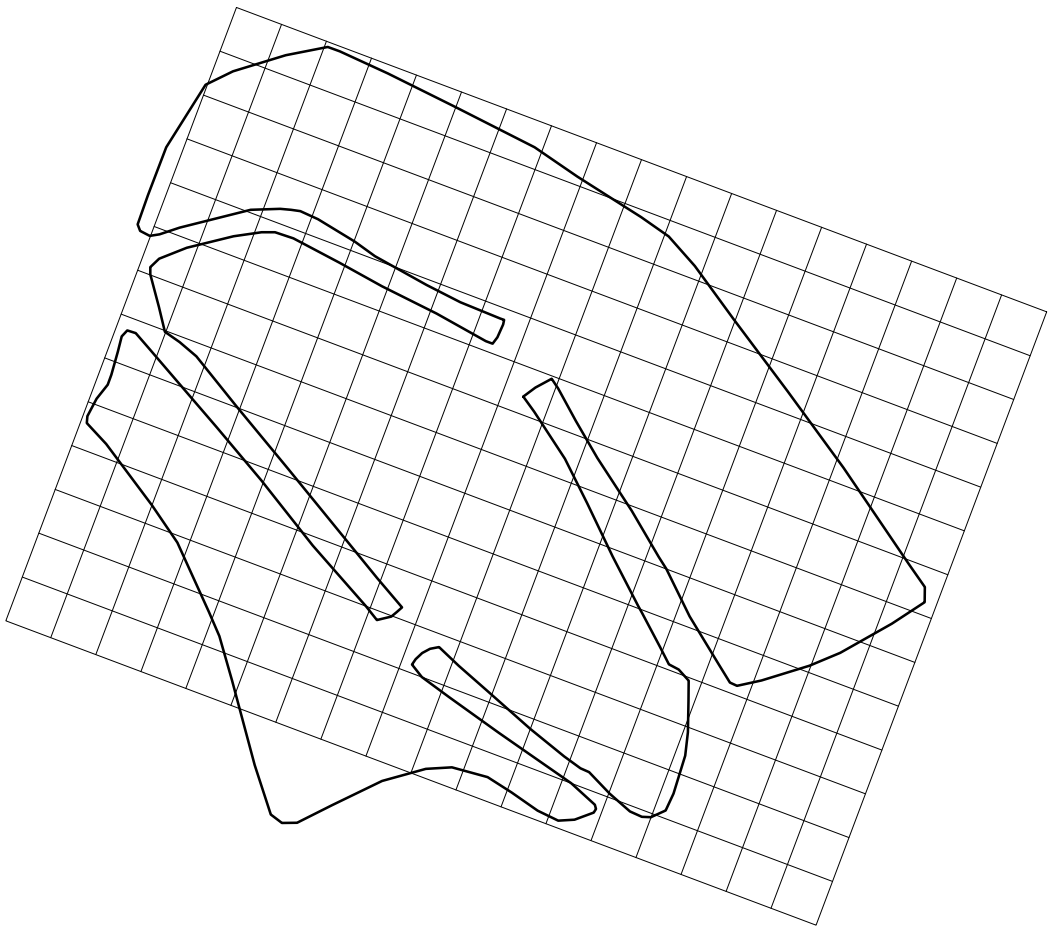

Fig. 5

Fig. 4 Map of Venice as in 1500 in the same perspective of de Barbari's map, with a regular grid applied (drawing based on the original shown in Schulz, J. (1978) Jacopo de' Barbari's View of Venice: Map-making, city views and moralized geography before the year 1500. In *Art Bulletin,* LX).

Fig. 5 Plan of Amsterdam as in 1544, georeferenced trough a regular grid (drawing based on the original shown in Hameleers, M. (2015). *Gedetailleerde kaarten van Amsterdam: productie en gebruik van grootschalige, topografische kaarten*).

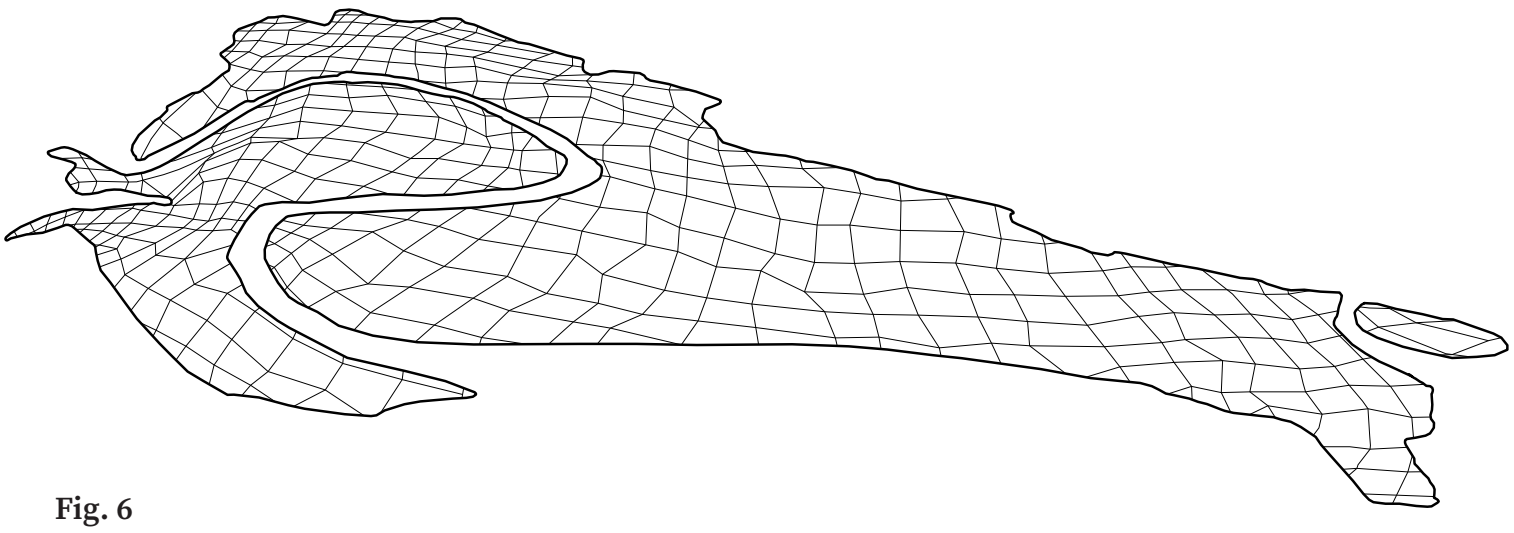

Fig. 6

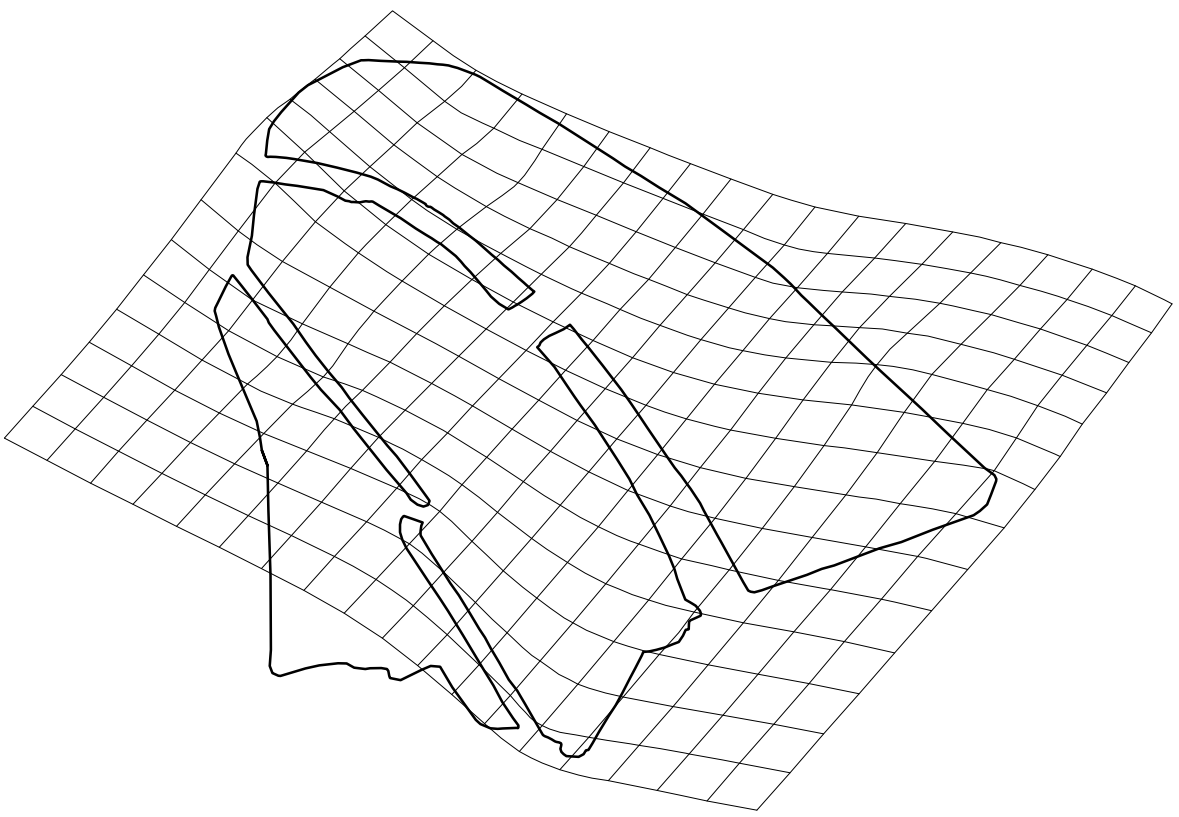

Fig. 7

Fig. 6 Jacopo de Barbari's map showing its distorsions trough the distorstion of the grid applied in fig. 4 (drawing based on the original shown in Schulz, J. (1978) Jacopo de' Barbari's View of Venice: Map-making, city views and moralized geography before the year 1500. In *Art Bulletin*, LX).

Fig. 7 Cornelis Anthonisz's map showing its distorsions trough the distorstion of the georeferenced grid applied in fig. 5 (drawing based on the original shown in Hameleers, M. (2015). *Gedetailleerde kaarten van Amsterdam: productie en gebruik van grootschalige, topografische kaarten*).

The landscape surrounding the two cities is also represented with further and more evident distortions. Despite having raised the point of view from his previous portrait, in the map from 1544 Anthonisz represents the rural environment around Amsterdam just as in the painting from 1538. This results in an evident contradiction, as the city and the landscape have two different perspectives (Bakker, Schmitz, 2007). Moreover, the horizon, which is in principle incompatible with an almost two-dimensional representation, is still prominent in the printed version just like in the painted one. Finally, the course of the plots outside the city wall deviates significantly from the actual situation, suggesting that Anthonisz did not measure them as meticulously as the city, but rather filled in the landscape based on feeling.

A different strategy is identified by Masciantonio (1999) in his analysis of the Venetian view. Through the orientation of the winds' heads previously described, de Barbari suggests that the plane he is drawing on is not flat but spheric. Indeed, the southern heads blow from the bottom while the northern from the top. This correct representation of the Earth's surface as curved is however exaggerated in the angle so that the artist can represent on the background other islands such as Burano and even the Alps, which are drawn as elevations.

In both maps, the distortion that occurred in the landscape appears as a conscious choice made by the artists to portray the cities as powerful entities that extend their influence beyond their borders on much wider territories.

Symbolisms

We have already mentioned the representative nature that characterizes the views of Venice and Amsterdam, analysing their purposes and the technical choices made by the artists to fulfil them. However, it isn't only through the particular points of view nor by the detailed representation of ships that the cities declare their maritime power, but also with the symbolic association to the Roman sea god Neptune. This figure is portrayed in both maps as the city protector. Anthonisz reserves Neptune an important placement: in his view the sea god is a prominent presence who monitors Amsterdam sitting on the clouds, holding the city name and the coat of arms. Such elevated position is reserved by de Barbari for another god, Mercury, while Neptune seems to protect directly the city from the sea, among the Venetian navy.

The symbolic axis connecting the two gods through San Marco depicts Venice as a *portus* and an *emporium*.[8] Due to their scale, the Venetian gods appear much more coherent in the structure of the drawing than Anthonisz's Neptune, whose enormous dimensions reveal he was added into the view.[9]

A study by Howard (1997) suggests further symbolic connotations of Venetie. M.D., taking into particular consideration the shape in which the city is represented. According to Howard, the eastern compression of the map "was a deliberate manipulation to achieve a specific iconographic purpose, namely to give Venice a visual image of a dolphin". The animal shape can be noted considering that the left perimeter of the city resembles the distinctive mouth of a dolphin, while the right one could be seen as its tail. This association of the city with the maritime animal could hold several meanings. Since ancient times, the dolphin had been an attribute not only of Neptune but to the love goddess Venus, after whom Venice may have been named.[10] Just like Venus, the city of Venice could be here depicted as a representation of beauty. Yet even Mercury has a mythological association with the same animal, as the god responsible for escorting souls into Hades. Through this last association, the dolphin also acquired a Christian significance as a symbol of resurrection. Although 'la Serenissima' guarded her political and religious independence, she was proud of her reputation as a holy city, the first stage in the sacred Pilgrim route to Jerusalem.

As Eisenman (1982) declares, perspective creates the illusion of reality. Despite relating to reality, a perspective is always a re-constructed view of the existing. The relationship between reality and representation is not therefore direct but needs an intermediate step. In this process, the view is adorned with other connotations that go beyond the photographic image of the object. This stage of transition exists also in the relationship viewer-object: the viewer reads a meaning in the

8 In the map the two gods present themselves through the following inscriptions: 'MERCURIUS PRECETERIS HUIC FAUSTE EMPORIS ILLUSTRO' / 'AEQUORA TUENS PORTU RESIDEO HIC NEPTUNUS' ('I, Mercury, shine favorably on this which surpasses all other emporiums' / 'I, Neptune, reside here preserving the waters in this port').

9. The original painting from 1538 did not include the figure of the god, who was added by Anthonisz only in the first printed version from 1544.

10. It is believed that the name Venice derives from "Italic Venus", the Roman goddess of love and beauty who, according to the myth, was born from the sea near the Venetian lagoon.

object and because of that he is the subject of the relation. In the end, perspective is a mediation between man and nature, between what we see and the way we see that.

The imperfect correspondence with reality is therefore acceptable and accepted by the viewer as the perspective plans of Venice and Amsterdam convey a bigger message than the objective description of the cities, presenting them as the cities themselves want to be presented to the whole world. Nevertheless, the fortune of de Barbari's and Anthonisz's works has been so vast that their maps have conditioned the image of the two cities over the centuries.

2.

Drawing the Future

Although they appear to depict Venice and Amsterdam as fully developed cities, De Barbari's and Anthonisz's maps actually show two cities in the process of evolving. This consideration seems beyond doubt in the Dutch example, since the image of Amsterdam given by Cornelis Anthonisz represents only a portion of the modern capital, but it is not as obvious in the Italian case. As Tafuri (1989) declares, the constancy of the imago urbis in Venice has been more politically determining than in any other city of the Peninsula. The architecture historian further reasons that this radical attachment of La Serenissima to her changeless image may lay in a simple urbanistic motivation: no instauratio is conceivable where utopia has already been achieved, but only fragments of renovatio. Venice has been indeed presented for centuries in both literature and iconography as "miraculously" raised in the middle of salty waters[11] and strictly without walls (Svalduz, 2003). However, the truth behind this miracle lies in countless operations of continuous maintenance, aimed at controlling the lagoon.

The growth of Venice has therefore always been limited to modest and suffered interventions, whereas Amsterdam followed an almost linear path over time of gradual expansion This fundamental diffe-

11. We have already discussed the mythical link between Venice and Venus. In the iconographic tradition the goddess of love is often depicted arising from the sea, just like in her most famous representation, *Nascita di Venere* by Sandro Botticelli, dated between 1485 and 1486.

rence lies in the origin of the two cities. Venice was built on natural islands that were gradually connected, while Amsterdam is a hybrid city, built on both land and water and crossed by human-made canals (Feddes, 2015).

Two maps show how similar urban interventions respond to the disparate necessities of two cities, implying very comparable graphical choices: *Mappa di Venezia* by Cristofo Sabbadino from1557 and Johannes Isaac Pontanus' *Map of Amsterdam*, published in 1611.

Engineering the map

In order to understand the significance of both maps in the history of the development of the two cities some historical background is needed. Before exploring that, it is also relevant to consider the type of drawing, the nature of the maps in comparison, and the framework of their authors.

First of all, both maps are plans. They are very distant from the representation typology of their previous respective from 1500 and 1544, as they both lack the depth and complexity of a perspective view. At first sight, Sabbadino's map doesn't seem to be subject to de Barbari's influence at all, not even in the orientation of the city[12], which is instead the mirroring of Fra' Paolino's disposition.[13] The influence of Anthonisz's view is still perceivable in terms of cardinal directions – the north is placed at the bottom of the drawing in both maps – but that looks to be the only similarity between Pontanus' work and the previous. The choice of orthogonal projections as the drawing technique is directly related to the category the two plans belong to, i.e. that of military-engineering maps. Both representations can be considered as urban master plans *ante litteram*, as the picture proposals for the future development of the two cities. This engineering character is also reflected in the authors: Cristoforo Sabbadino was *proto dell'uffitio dell'acque*[14] of Venice from 1542 to his death in 1560 (Svalduz, 2003),

12. In *Venetie. M.D.* de Barbari depicts Venice with the North in the top of the drawing, while the upper portion of Sabbadino's map is occupied by the eastern part of the city. This orientation East-West used to be the general rule of cartography: it derived from the Latin verb *oriri* (to rise) and referred to the path of the Sun during the day.

13. Cfr. 1.

14. Literally "First technician at the service of the Water Judiciary". Cristoforo Sabbadino defines himself with this title in one of the inscription of the map: "Ricordo de mi christofaro sabbadino Ingegnero, et Proto dell'uffitio dell'acque dato l'anno 1557.

while Johannes Isaac Pontanus was a Danish historiographer, who represented in his map the work of Hendrick Jacobsz Staetes (Feddes, 2015), Amsterdam *stadstimmerman*[15] between 1582 and 1630.

The work of Sabbadino is to be contextualized in a series of studies from the engineer himself, aimed at the development of strategies and infrastructures to counteract the erosive action of the sea (Svalduz, 2003). The map from 1557 is not the only product of the kind drawn by the author. A previous map from 1546 by Sabbadino faces the same problem from a larger perspective, representing the hydraulic system in and around Venice from a territorial scale. The commission to monitor the waterways was assigned to Sabbadino by the Council of Ten[16] in 1506, alongside Nicolò dal Cortivo, Gaspare dall'Abaco, and Alvise Cornaro.[17] The main quarrel over the lagoon involved Sabbadino and the latter. The dispute was based on how to implement the conservation of the integrity of the lagoon, for which there was complete agreement (Boccazzi, 2010). While Cornaro proposed interventions in the hinterland through the diversion of watercourses, Sabbadino suggested focusing on the fortification of the embankments with a continuous foundation all around Venice. This second proposal sets a rigid and unchangeable border between the lagoon and the urban space and therefore gives the city a finished shape. As addressed by Svalduz (2003), the model of urban development applied by Sabbadino is closed, as Venice is bound to grow on itself. However, the boundary remains still natural and respectful towards the balance between land and water, on which the salvation of Venice depended. Furthermore, the Venetian engineer gives a glimpse of the possible urban development, suggesting obtaining new building land[18] through the accumulation into the pockets placed on the edge of the city of the sludge removed from the canals in the ordinary operations of reclamation. All the details of the intervention, including dimensions,[19] are given

15. Literally "city carpenter" or "city master", the *stadstimmerman* was a carpenter and architect who carried out construction for or on behalf of the city (Wikipedia, 2024 C).

16. The Council of Ten, also known as the Council of X or simply as the Ten, was a governing body of the Republic of Venice that existed from 1310 until the fall of the Republic in 1797. It was comprised of ten members and was elected annually by the Great Council. The Council was responsible for overseeing the security of the Republic (Wikipedia, 2023 A).

17. Alvise Conaro (1484-1566) was an Italian writer, man of letters and patron of the arts. He expressed his suggestion of intervention in the Venetian lagoon in his note *Arricordo di me Alvise Cornaro del modo che si debba tenere acciocché il fiume Musone con la Brenta vadi al mare per il porto di Chioza, come hora va per quelo di Malamocco con tanti danni* (Mazza, 2010).

18. Areas represented in green on the map.

by the author himself as notes written on the map. Only fragments of this proposal would be developed in the expansion decided in 1588-90. However, Sabbadino's map remains a complete urban and hydrographic reorganization plan for Venice (Tafuri, 1989).

As already mentioned, Pontanus' map is the representation of someone else's work, namely Hendrick Jacobsz Staetes. The city carpenter of Amsterdam was commissioned by the city fathers in 1610 to produce a preliminary design for a massive urban expansion (Feddes, 2015). For a long time, it was believed that Staetes' plan, of which the original drawing had been lost, had served as the blueprint for the realization of the 17th-century expansion of Amsterdam, known as the 'Ring Canals'. This belief was based on the unity in form and design that characterizes the intervention. However, architectural historian Jaap Evert Abrahamsen has shown in detail that the design process was more complex, done in phases, and spanned roughly two or three periods.

There are three versions of Pontanus' map – dated 1611, 1613, and 1614 – and they are included in the author's work *Rereum et urbis Amstelodamensius Historia*, a description of the navigations that the Dutch made at the end of the 16th century on their way to the East Indies, firstly published in 1611 by Joducus Hondius I, and in its following editions by his son, Joducus Hondius II. When examined in sequence, the drawings appear to outline Staetes' development of the plan for expanding the city. The initial version portrays the new fan-shaped city walls in a basic schematic form. The subsequent map from 1613 shows a more detailed segment of the walls. Finally, the last edition depicts the defensive bastions more realistically and elaborately. It should be also noted that the number of defences shown on the maps significantly dropped from 29 in the first two versions to 23 in the drawing from 1614. This was due to the involvement of Mauritius van Nassau, who was the *stadthouder*[20] of Holland and a military expert. The city council had sought his help as Staetes, who was responsible

19. The unit of measure used by Sabbadino is *passo quadrato* ("square steps"). One square step approximately corresponds to 0,5476 m².

20. Stadtholder was the title of one of the most important officials in the Republic of the Seven United Netherlands. He was originally a nobleman who, on behalf of the lord, stood in for him in one or more provinces and exercised his authority. The title was introduced into the Burgundian Netherlands by the Duke of Burgundy. This position existed from the middle of the 15th century, until 1747 when there was only one stadtholder and the position was declared hereditary. (Wikipedia, 2024 D).

for the maps, had limited knowledge of the subject (Bakker, Schmitz, 2007). Mauritius van Nassau's intervention resulted in a distancing of the strongholds and their depiction as mill yards in the latest map.

The city in icons

The simplification of the city in the maps does not only appear in the drawing method implied. The urban structures of Amsterdam and Venice are also schematized to the essentials, as the cities are represented through the axonometric representation of their main buildings. Those icons, and the matching writings that define their names, distinguish the different areas of the two cities and serve as points of orientation to understand the positioning of the different interventions suggested. The choice appears extremely modern as it follows the definition of 'landmarks' given by Kevin Lynch (1960), as "point references considered to be external to the observer".

In the Dutch case, a glimpse of the urban system is still visible: even if just in shape, Pontanus still outlines the plots in which Amsterdam is divided and consequently also the streets and canals that constitute the infrastructure of the city. On the contrary, in Sabbadino's map, all of that is gone. Venice appears as a flat landmass surrounded by water with some spread-out architectures magically arising from the ground. The selection of the latter is remarkably updated to the present moment and maybe even to the future, as the Venetian engineer includes among them the Palladian basilica of San Giorgi Maggiore – the construction site had recently opened and the building would only be completed after the death of Palladio in 1580 (Boccazzi, 2010).

This reduction of the city to its minimum elements is particularly efficient concerning the aim of the two maps, which is not to describe in detail the existent, but to schematically explore the future urban layout.

Graphics of the future

The "proto-master plans" of Venice and Amsterdam are not only innovative in terms of urban design, as already mentioned, but they are also visionary in the graphical representation of future scenarios. The two maps imply a series of mixed visual elements to translate the intervention suggested and explored by the authors in the drawings.

Cristoforo Sabbadino uses five main colours to differentiate the various city components: blue for the canals, a lighter blue for the lagoon shallows, white for the urbanized areas, sepia for the proposed foundations and bright green for the surfaces of which the landfill is proposed. The contrast between the latter and the other chromatic nuances significantly contributes to highlighting the modest expansions proposed by Sabbadino, placed behind the Giudecca, beyond San Biagio, from Santa Maria Maggiore to Santa Chiara, at the tip of Cannaregio, between the Mercy and Saint Justina (Svalduz, 2003). Even if most of those areas never existed,[21] their representation is still relevant as it proved that the Venetians could regain land from the waters of the lagoon (Vianello,1998).

The design for the new 'Ring Canals' of Amsterdam is represented through a play of line weights and line types. A single dotted mark traces the trajectory of the future walls, which are given a more realistic three-dimensional connotation with continuous lines in the bottom right of the drawing. Compared to Sabbadino, Pontanus' way of representing the future layout of Amsterdam is much more delicate and almost transmits a feeling of uncertainty, reflecting the variability of Staetes' plan which rapidly changed in shape and path throughout the three versions (fig. 8-10).[22] Due to the lack of resources, the defensive system was enlarged in two stages: first one half of the semi-circle, then the other (fig. 11-12). Despite the different path taken by the result, Staetes' fan-shaped layout is still retraceable in the outcome because of two main reasons: the semicircular form was logical as an offset of the preexisting walls, and it was also a mixture of limiting economic and military strategies (Feddes, 2015).[23]

Curiously, the thick line representing the new foundations in the Venetian map also results dashed as it is divided into segments by the canals placed at the urban perimeter (fig. 13). The watercourses are depicted as gradually fading from the edge of the city to its core. This graphical choice portrays Venice as a compact system divided into just three main islands (Vianello, 1998), rather than the 118 that form the

21. The expansion of Venice decided in 1588-90 is only a fragment of the plan developed by Sabbadino (Tafuri, 1989).

22. Hameleers (2013) suggests that a fourth map may have existed as an earlier stage of the plan from 1611.

22. The distance between the old and the new walls (100 rods) "was determined by the width of the field of fire, the strip of land around the city which could not be built on for military reasons and legal condition" (Feddes, 2015).

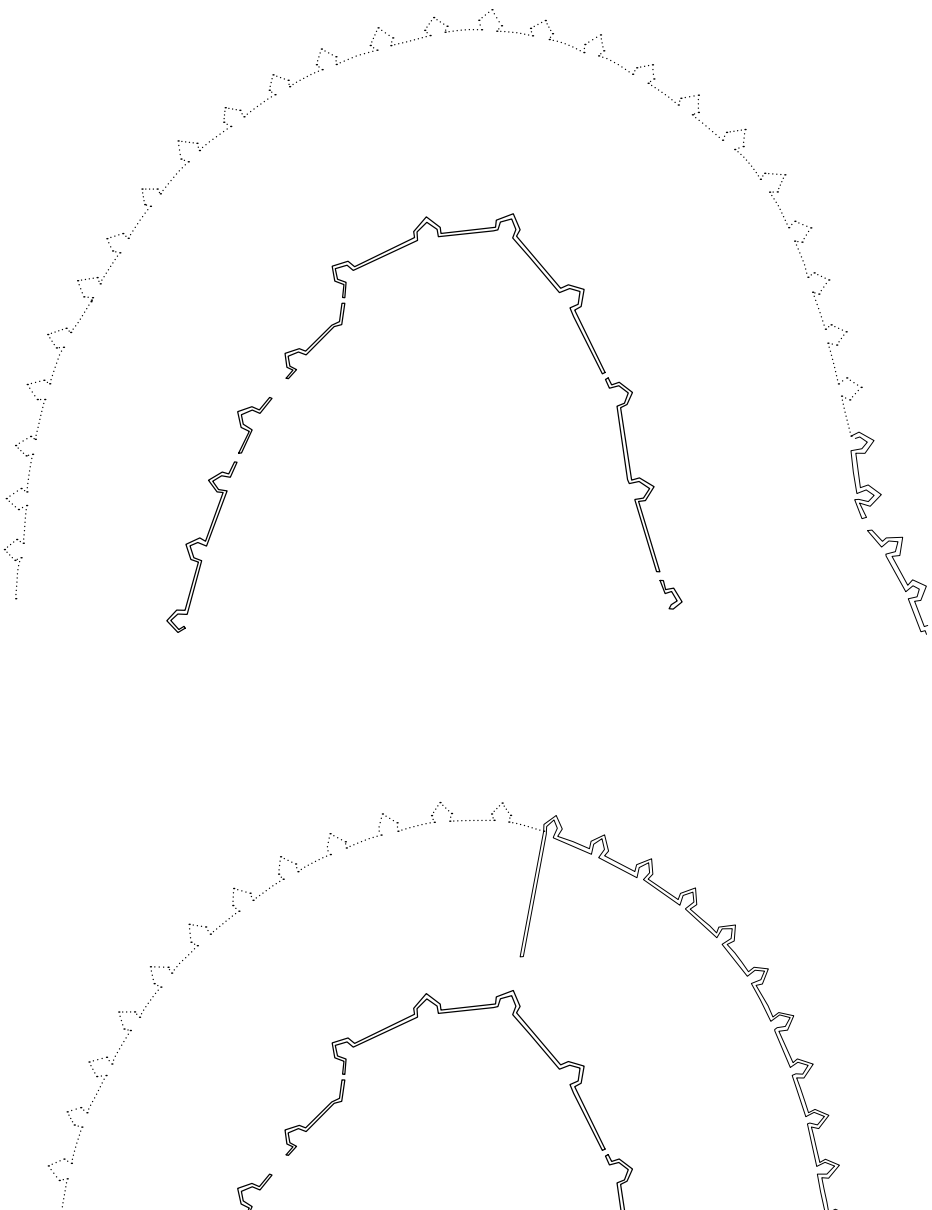

Fig. 8

Fig. 9

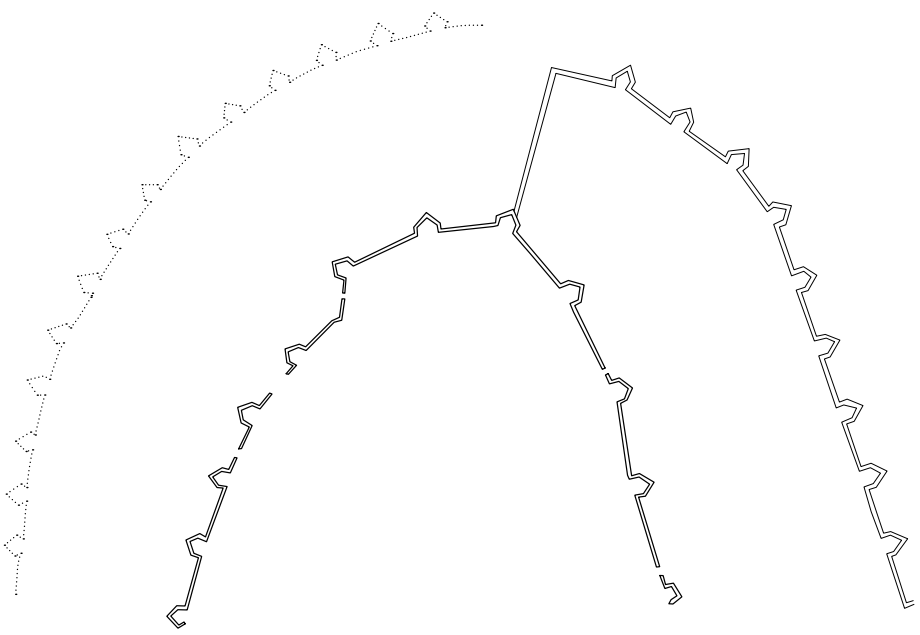

Fig. 10

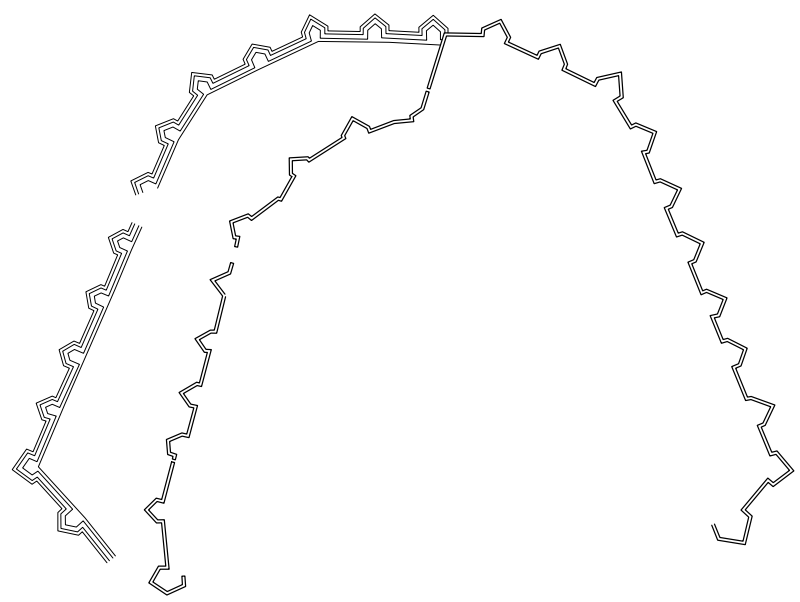

Fig. 11

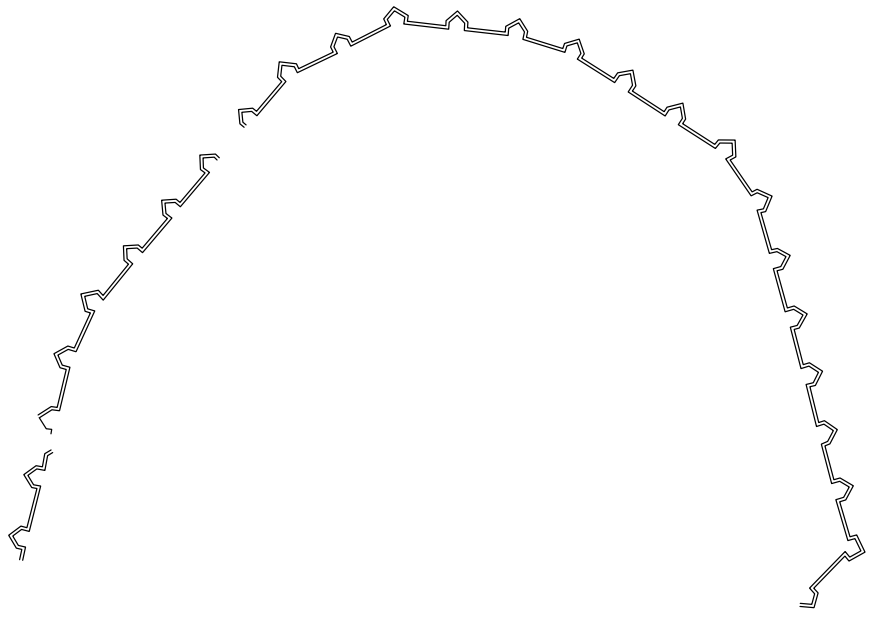

Fig. 12

Fig. 8 Scheme of representation of the city walls in the *Map of Amsterdam* from 1611 by Johannes Isaac Pontanus. In double thick line the existing walls, in double thin line the future walls under planning, in single dotted line the imagined development of the future walls (as in the original drawing).

Fig. 9 Scheme of representation of the city walls in the *Map of Amsterdam* from 1613 by Johannes Isaac Pontanus.

Fig. 10 Scheme of representation of the city walls in the *Map of Amsterdam* from 1614 by Johannes Isaac Pontanus.

Fig. 11 Scheme of representation of the city walls in the *Map of Amsterdam* from 1649 by Joaen Blaeu. In quadruple thin line the imagined development of the future walls (as in the original drawing).

Fig. 12 Scheme of representation of the city walls in the *Map of Amsterdam* from 1663 by Daniël Stalpaert.

contemporary urban structures. All the exceptions to this rule correspond with the green portions of the map, the most relevant example being the island of Giudecca, where the main expansions suggested by Sabbadino take place. This distinction between continuous canals and fading ones suggests that the engineer felt the need to specify the course of the future canals as they represented the infrastructure of the new city lands.

The faded-non-faded rule is flipped in Pontanus' map: here the existing canals are continuous, while the new ones gently dissolve from the old border to the future city walls (fig. 14). This graphical expedient could also be interpreted as a symbolic representation of how urban developments used to be planned. At that time, the majority of city designs were made from the outside to the inside: first came the drawing of the new defence, then the development of the area inside (Feddes, 2015). In other words, the land was to be first conquered, and then constructed.

As previously discussed, Sabbadino's and Pontanus' plans are representations of proposal interventions over the cities of Venice and Amsterdam that have not been realized, at least not exactly as delineated in the two maps. That means they portray urban situations that never existed. Where then lies their truthfulness? Certainly not in the exact correspondence between the drawing signs (representation) and the physical elements of the city (what is represented) , but in their value as documents: "means, especially graphic ones, that prove the existence of a fact, the accuracy or truth of a statement" (Treccani, n.d.). Applying this definition, we do not consider as "facts" the future outcomes of transformations, but the ideas behind their design.

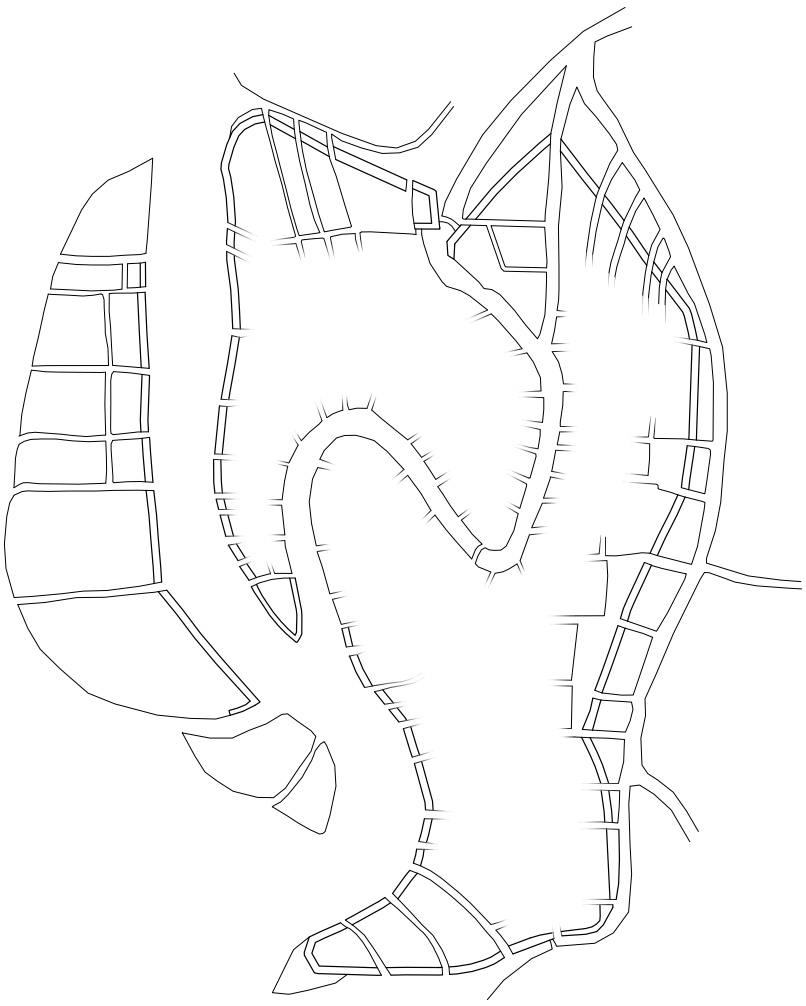

Fig. 13

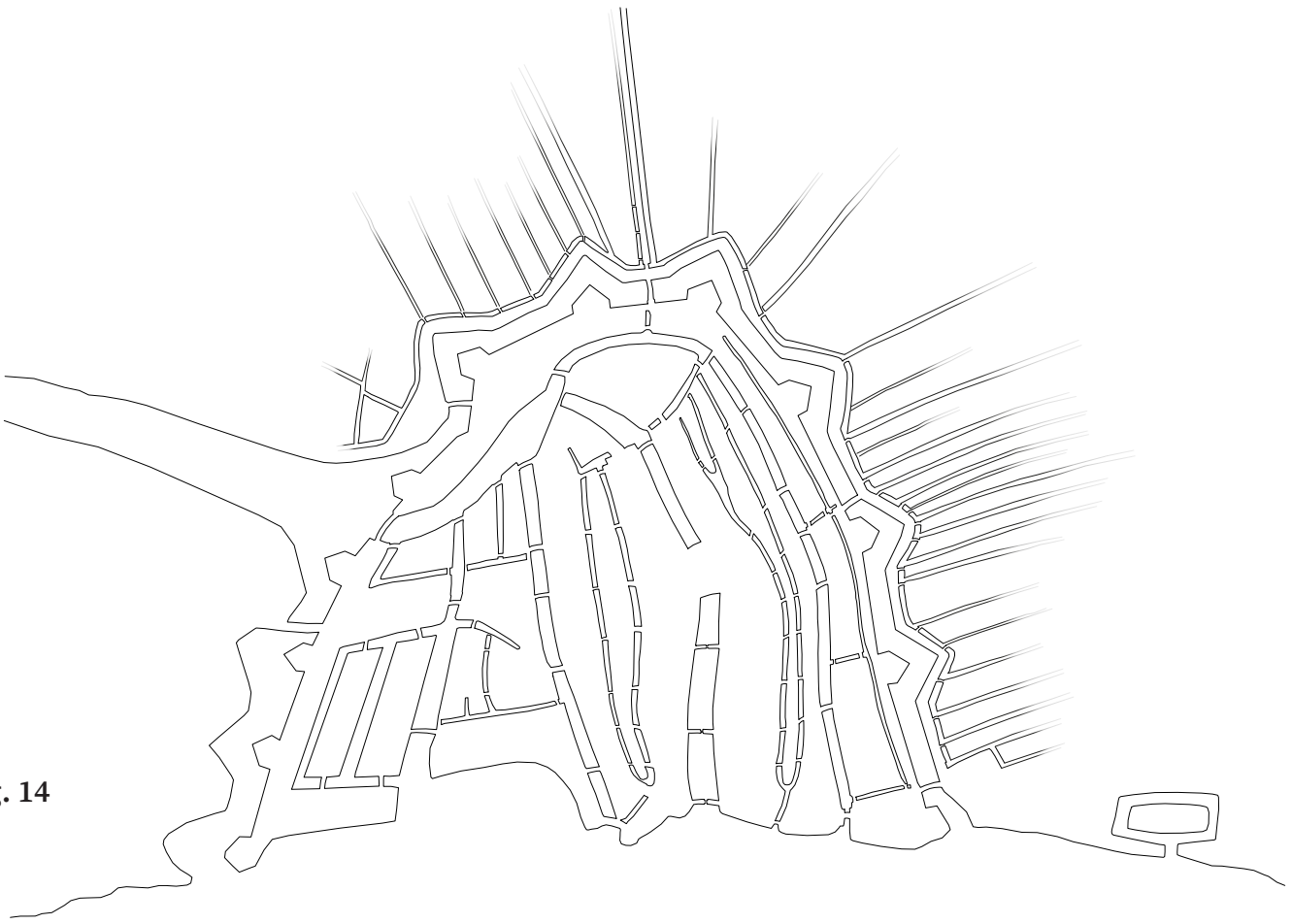

Fig. 14

Fig. 13 Scheme of representation of the new foundations (thick dashed line) and water system of Venice in Sabbadino's map.

Fig. 14 Scheme of representation of the water system of Amsterdam in Pontanus' map.

3.

Late portaits

The urban transformations that occurred in Venice and Amsterdam directly implied the need to visually record these changes and consequently update the image of the city. Among the rich cartographic production of the XVI century, two maps stand out for the precision their authors tried to apply in detailing the cities: *Vero e real disegno della inclita cita di Venetia* by Giovanni Merlo, dated 1676, and the earlier *Amstelredamum Emporium Hollandiae* by Balthasar Florisz van Berckenrode (1625). However, revising the imago urbis could not be carried out without a confrontation with the reference models, namely de Barbari's and Anthonisz's views, which had profoundly affected the identities of the two cities.

Merlo undertakes an almost impossible challenge: the changes resulting from the urban development previously discussed were not perceivable enough to make Ventie. M.D. look visibly outdated. The job was additionally hampered by the radical identification of the Venetian population in the image depicted by de Barbari and by that sense of *finitio* that had always characterized the city (Tafuri, 1989).

Regardless of the appearance, van Berckenrode's venture is no exception. The 'Ring Canals' intervention had significantly enlarged the Dutch capital in comparison to the stage depicted by Athonisz. However, the view from 1544 was so popular that the last edition, and pos-

sibly also the penultimate one,[23] was still rolling off the presses while the maps by van Berckenrode had already been published (Hameleers, 2015).

Common backgrounds

As for the other couples already discussed, the two maps by Merlo and van Berckenrode share different common features. The first is the use of a new printing technique, which substituted the old engraved wooden panels of de Barbari and Anthonisz with copper sheets (six for Venice, for Amsterdam).[24] This innovation allowed the artist to be much more precise since metallic plates were much easier to mark with defined lines (Hameleers, 2015). Yet, both archetypes bear the confrontation in terms of the quality of the details. Despite being commonly shown in colours, Merlo's and van Berckenrode's were printed in black and white. Before the XIX century, maps were usually hand-coloured after printing (Akerman, n.d.).[25] In particular, in the Venetian case, a clear reference to the original look of the drawing is present, in the form of an apology, in the main inscription.[26]

The second major similitude lies in the work commissions. Given the lack of sources, it is unclear whether Merlo produced his map as a personal initiative or not. The only clue regarding a possible commission can be found in the dedication of the drawing, which reports the name of Angelo Corraro, a Venetian Ambassador who used to serve at the Court of Rome.[27] Despite the much more numerous literature written on the famous representation of Amsterdam, a similar doubt characterizes the latter. Hameleers (2015) reports that Balthasar Florisz. van Berckenrode used to work as a commissioned surveyor, just like his father Floris Balthasar and his two brothers, manufacturing commercial products which were aimed to be sold to a vast public.

23. Cfr. 3.

24. Giovanni Merlo collaborated in the realisation of the map with the expert printer Stefano Mozzi Scolari, who was also the first publisher of the drawing (Giachery, 2012); van Berckenrode's map was edited by Philips Molenvliet (Hameleers, 2012).

25. Akerman (n.d.) notices the distinction in the coloured version of the map of the important buildings throught blue roofs to distinguish them from the red ones that cover common houses.

26. "[…] Conosco d'hauer adombrato su questo foglio Venetia tra l'oscurità degli / inchiostri, più tosto che esposta alla luce del Mondo, et alla chiara / immagine di si gloriosa regina non ho aggionto che l'ombre. […]" ("[…] I know that I have shadowed Venetia on this sheet among the darkness of the inks, rather than exposed to the light of the World, and to the clear image of such a glorious queen I have added nothing but shadows. […]').

27. "ALL' ILL^{MO} ET ECC^{MO} SIG^{R} ANGELO CORRARO K^{R} ET PROCURATOR DI S. M^{CO} […]".

However, in some archival documents, it is mentioned that the city council ordered some copies of the map, suggesting that the commission could have had a political connotation. The hypothesis could find confirmation in one of the many inscriptions of the drawing, in which the author devotes his work to the administrators of Amsterdam: the sheriff, mayors, aldermen and the 36 members of the council (Bakker, Schmitz, 2007).[28]

The innovative printing method and the obscurity regarding the actual existence of a commission for the works are both relevant elements in the interpretation of the maps. Indeed, through these two pieces of information, we could advance the fascinating assumption that Merlo's and van Berckenrode's maps may represent personal and conscious efforts to overcome the preexisting images of the cities expertly exploiting new technologies.

The 'scientification' of the model

Giovanni Merlo directly declares his intent to portray Venice as correspondent as possible to its actual image in the title of the map through a refined synonymy,[29] composed by the adjectives vero ('truth') and real ('real'). To do so, he works on de Barbari's map and tries to correct the distortions of the model with a series of operations (fig. 15). Firstly, Merlo chooses a slightly higher point of view for his bird ' s-eye perspective in order to facilitate the drawing process, just as Anthonisz had done in his xylography from 1544 in comparison with his previous painting. Moreover, the author intervenes in the relationship between the city and the landscape, flattening de Barbari's exaggerated bending of the surface. This correction is particularly visible in the background: where the model depicted the Alps in profile, Merlo simply reproduces the coast as a frame for the drawing. Finally, the islands of Giudecca and San Giorgio are also reshaped and re-dimensioned, appearing much closer to the real image. However, Merlo's representation still suffers the compression of the Eastern side of the city as well as the unclear relationship between Murano (drawn in perspective)

28. "MAGNIFICIS, AMPLISSIMIS, PRUDENTISSIMIS ET CONSULTISSIMIS URBIS / D. PRETORI, CONSOLIBUS, SCABINIS. AC SENATORIBUS TRIGINTA SIX VIRIS / INCLITE REPUBLICA AMSTELREDAMENSIS / HANC SUE URBIS CELEBERRIMAE ACCURATAM DELINEATIONEM / DEDICANT CONSECRANTQUE / Philippus Moleviet et Balthasar Florisz. van Berckenrode".

29. In the terminology of classical rhetoric, the term 'synonymy' indicates the strengthening of an expression obtained through the use of multiple synonyms.

and the complex of Burano, Torecello and Mazzorbo (drawn as elevations), which makes the island and the archipelago appear even closer to each other than in de Barbari's view.

The other significant difference between the two maps is to be found in the symbolism. Merlo rationalizes the image of Venice by removing all the divine allusions: Mercury and Neptune are excluded from the drawing - the author only refers to the latter god in the inscription[30] – while the angelic heads blowing on the city are replaced in the same positions by the name of the winds and an additional wheel which indicates their direction. The human figure only survives in the four putti holding the two inscriptions placed at the top corners of the map. The only considerable addition is represented by the city symbol, the winged lion of San Marco, who watches over Venice from above, almost aligned with the square of the same name.[31]

An overall enrichment

Compared to Merlo, Balthasar Florisz. van Berckenrode goes one step further than the model in terms of representation technique. Indeed, if Anthonisz's view could still be considered a perspective, the map from 1625 Amsterdam is drawn in plan, with buildings added in isometry. It must be mentioned here that this choice is not as innovative as it may appear since in1597 Pieter Bast had already depicted the city with the same technique;[32] however, van Berckenrode's map does not present significant distortions as the previous ones (Hameleers, 2015). The influence of Anthonisz's view is still perceivable in the drawing orientation, with the IJ in front raw suggesting the opening of Amsterdam to the world, while the level of detail largely surpasses both the 1544 model and the edition from 1597.[33] It is interesting to notice how van Berckenrode's manages to give deepness to the two-dimensional representation of the plan in the bottom part of the drawing, where the different scales of the ships depicted give the impression t that

30. "Surgit in aequoreis Neptuni urbs inclita [...]" ('The famous city rises in Neptune's aquarius [...]').

31. It is significant to notice the absence of the city symbol in *Venetie. M.D.*as evidences demonstrate that the winged lion of San Marco had been part of the Venetian imaginary from the early XIII century.

32. Bast depicted Amsterdam in a smaller scale compared to van Berckenrode, approximately 1:2300 and 1:1950 (Hameleers, 2015).

33. Van Berckenrode's map has two following editions, in 1647 and 1657, edited after the author's death. Both versions register the latest transformations of Amsterdam on the original map; however, in none of those representations, the quality of the additions (often represented in repetitive blocks) does not match the edition from 1625 (Hameleers, 2012).

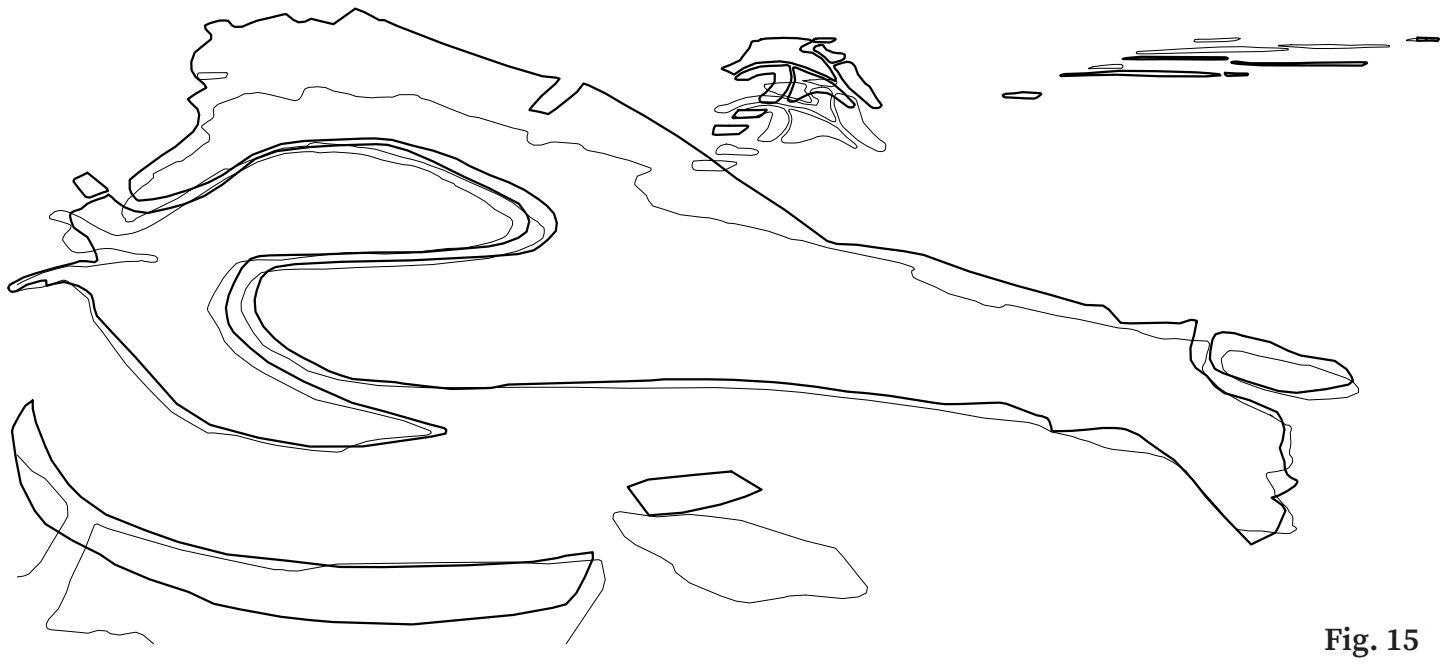

Fig. 15

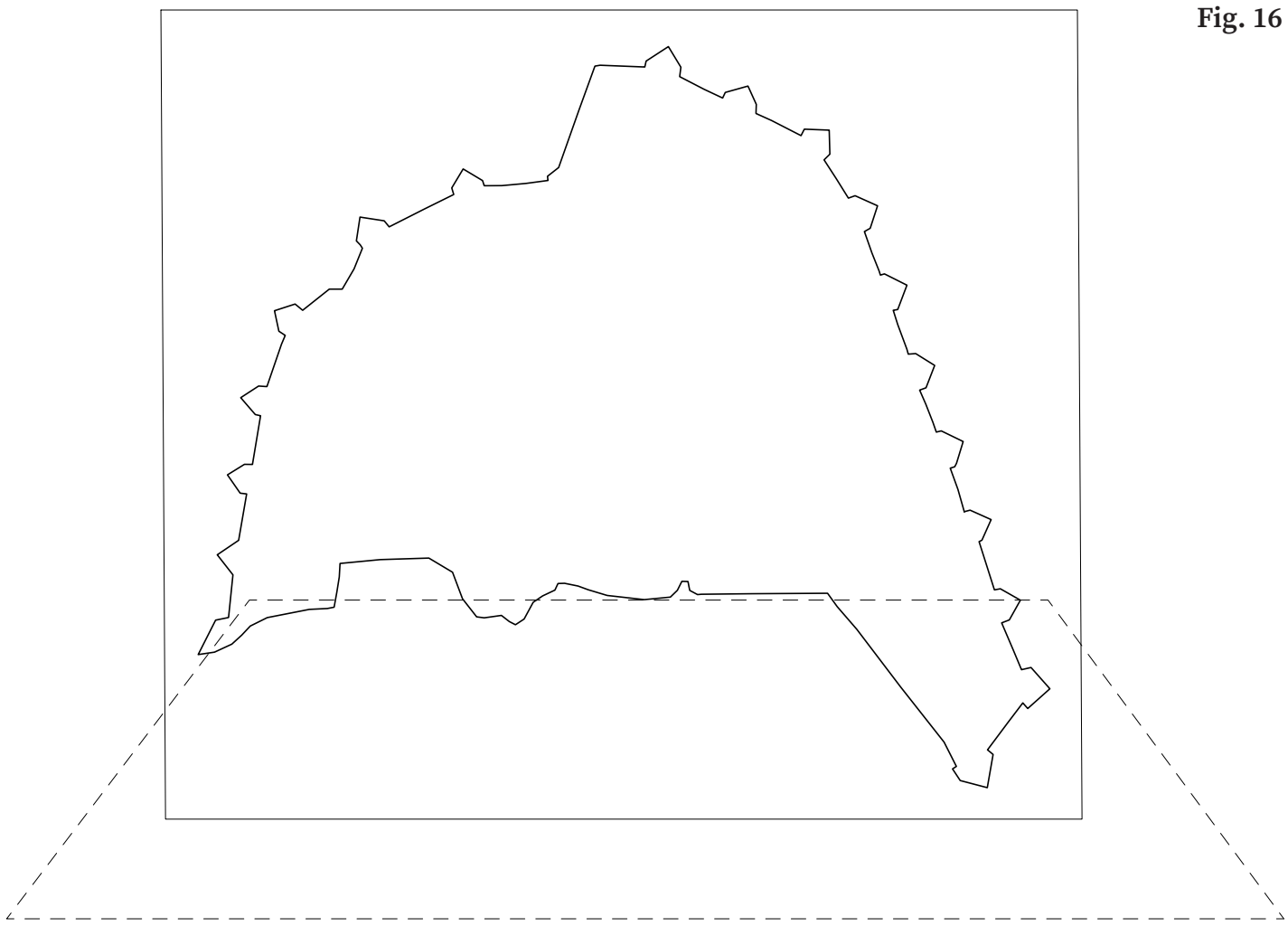

Fig. 16

Fig. 15 Comparison between the point of view of Merlo's map from 1676 (thicker line) and de Barbari's map from 1500 (thinner line).

Fig. 16 Scheme of perception of the different planes in van Berckenrode's map from 1625: in continous line the vertical plane on which the city lies, in dashed line the perspective plane suggested by the scales of the ships.

the waterfront and the city are represented in two different planes, the first coming into the second (fig. 16). Finally, the author enriches the drawing with information, attaching two cartouches in the upper corners: the left one contains a city profile from the IJ, the right one a 'keymap' of Amstelland and the surrounding area, including the Waterland and the agricultural hinterland. As Bakker and Schmitz (2007) assume, this last image was suggested to the author by Petrus Scriverius[34] as a counterpart of the city portrait previously mentioned: this duo introduces the idea that Amsterdam's commerce is based on both imports and exports, namely the trade of city and country. The concept is noted in the title of the map through the introduction of the word emporium, which van Berckenrode seems to borrow directly from de Barbari.

More references to the Venetian map from 1500 appear in the symbolism of the map. Mercury is added to Neptune, previously depicted by Anthonisz, in the leading role of the city; the two divine figures are characterized by their typical accessories, such as the winged shoes and the trident but, apart from those, they are not given a mythical appearance, rather a contemporary look (Bakker, Schmitz, 2007). Both gods are related to a scroll: a compass, the typical cartographer's tool, is represented in the one under Neptune, while Mercury accompanies a Dutch poem by Scriverius, which contains the apology that the city has indeed been reduced to a map, but not to its disadvantage. The same poet is the author of the Latin verses placed right under the top left cartouche, in which he narrates the resurrection of the Greek painter Apelles,[35] who started wandering around the world and eventually reached Amsterdam, admiring the city as a second Venus. A medallion above the poem frames the representation of the goddess of love as newly born from the seawater.[36] Moreover, the symbolic equipment of the map includes a lion and the city coat of arms, respectively positioned to the right and the left in between the top cartouches, and a personification of Amsterdam over the profile of the IJ.

Finally, van Berckenrode's map also represents an important histori-

34. Peter Scriverius (1557-1660) was a Dutch poet and writer. He is the author of both poems in the map and collaborated with van Berckenrode also in terms of graphical choices, such as for the decorations of the frame that encloses the map of the Amstelland (Bakker, Schmitz, 2007).

35. Apelle (375-370 B.C.– end of IV B.C.) was an ancient Greek painter; he is referred to by Scriverius for his painting of Venus *Anadyomene*(Bakker, Schmitz, 2007).

36. This image is another possible reference to the Venetian ***imago urbis*** (cfr. 10-11).

cal document because of all the other urbanistic information added to the drawing, namely the description of the latest city intervention in a triangular scroll over the figure of Mercury and a complete list of all the streets names on the right of the image. This last register is particularly interesting since, due to the drawing technique, the author could not delineate the city plots in detail (Hameleers, 2015).[37]

These attempts to overcome the models, whether less or more successful, are important late witnesses of a tendency which is about to change in the history of cartography. The proven impossibility of making a map that completely corresponds to reality will lead cartographers to abandon the venture to focus on a new role for maps, in which the perfection of the *imago urbis* not only is no longer required but actually could also be confusing.

37. Hameleers (2015) identifies the same issue in the previous maps by Anthonisz and Bast.

4.

The map as a political tool

During the Age of Enlightenment, maps underwent a crucial transformation in their cultural significance. The scientific revolution just occurred[38] and the consequent boundless faith in human reasoning contributed together to remove any artistic connotation from the realization of maps in order to focus on absolute precision. Additionally, the emergence of the concept of nation in the 17th century caused cities to lose their identification role, making the depiction of their images no longer necessary (De Seta, 2014). Indeed, citizens would no longer recognize themselves in communities restricted by city walls but as a people. As a result, maps acquired a new role in society and became a scientific tool for urban development.

A historical leap forward brings us to the 20th century, the period in which city planning reached its peak through the realization of "Master Plans" all over Europe. It is relevant to notice that the expression directly alludes to the drawing method implied in the realization of the map. The horizontal projection of the plan allows for the greatest degree and thus the control needed in the design of urban transformations. Examples of this are Cornelis Van Eesteren's *General Expansion Plan for Amsterdam* in 1935 and the *Variante generale al PRG* of Venice

38. The scientific revolution was a period of extraordinary development in science. It is conventionally dated between 1543, the year of publication of Nicolaus Copernicus' *De revolutionibus orbium coelestium*, and 1687, the year of publication of Isaac Newton's *Philosophiae Naturalis Principia Mathematica* (Wikipedia,2024 B).

produced by Leonardo Benevolo in 1994. The analysis of this plan will illustrate another key passage in the relationship occurring between a map and reality.

Politics of a Master Plan

The worlds of cartography and politics have always been characterized by a special connection. This interdisciplinary link is evident in all the maps previously analyzed, whether in the commission of the work, as in the case of de Barbari and Anthonisz, in the given task to explore future scenarios (Sabbadino and Pontanus/Staetes) or in those figures to whom Merlo and van Berckenrode dedicate their efforts When it comes to Master Plans, the bond between cartography and politics becomes stronger than ever. The map is not only a scientific tool used to outline the evolution of a city, but it is also political because its primary purpose is to illustrate governmental initiatives. In short, politics is the fundamental condition for the existence of Master Plans. This is no exception for van Eesteren's and Benevolo's works.

The proposal for the expansion of Amsterdam was commissioned by the council of the Dutch capital through the figure of Wichert Arend de Graaf, director of the Urban Development Department added to the Public Work Service in 1928 (van Rossem, 1993). The choice of the designer was not immediate. Despite the talent for urban planning already shown by van Eestern in his earlier works,[39] de Graaf was initially hesitant to choose him because of his young age, but in the end, he was convinced by the plan for Amsterdam-West presented in September 1929 (van Rossem, 1993). The design process developed over six years of work and was finally approved by the municipal council in 1935 and by Royal Decree in 1939 (Hameleer, 2012).

The plan for Venice realized by Benevolo was based on earlier reflections matured by the author in the late 70s, later successfully presented in 1996 when the Italian architect and urbanist was officially called by the city mayor as a director for the development of the city (D'Agostino, 2017). The Master Plan demonstrates a deep understanding of the problems arising from the previous version of 1962 as well as the importance of contemporary larger-scale plans, in particular,

39. Among those the most significant are the two important competition plan designs for the Rokin in Amsterdam (1924) and for Unter den Linden in Berlin (1925), with which Van Eesteren won first prize, and the traffic plan for Paris from 1926, realized together with George Pineau (van Rossem, 1993).

the Provincial-Territorial Plan (PTP) preliminary approved in 1995. Benevolo (1996) himself sustains indeed the need to coordinate the respective plans of the City and the Province of Venice.

So far the two works seem to match almost perfectly the previous episodes featuring respectively Staetes and Sabbadino as protagonists. The maps of Venice and Amsterdam from 1557 and 1611 have already been described as extremely innovative in various aspects, including the figure of the cartographer as a 'scientist' of different kinds.[40] What is new in the case of a modern Master Plan is the complexity of the 20th-century city requires teamwork. Therefore the urbanist who creates the plan does not necessarily coincide with the map-maker but instead, they direct the work of multiple people. This applies to both examples: van Eesteren worked as a member of the Urban Development Department (van Rossem, 1993), while Benevolo first produced his early reflections with his students and later was included in a larger development team (D'Agostino, 2017).

A territorial scale

Since the late portraits by Merlo and van Berckenrode, both cities significantly changed. Amsterdam continued its radial expansion to the South as well as to the North, across the IJ, while Venice had undergone its most remarkable development with the construction of the train station of Santa Lucia from 1860 on. However, these transformations left behind different urban conflicts.

Van Eesteren was mainly tasked with addressing the relationship between Amsterdam and its surrounding areas. In the late 19th century, the painters of the 'Hauge School'[41] had implicitly criticized the stark contrast between the city and the countryside that arose from industrialization. As van Rossem (1993) points out, the General Extension Plan presented in 1935 "aims at an optimal balance of built and unbuilt spaces on the periphery of the city". Van Eesteren succeeds in establishing a more balanced relationship between Amsterdam and the landscape and significantly contributes through his proposal

40. As illustrated in Chapter 2, Cristoforo Sabbadino was a water engineer, while Johannes Isaac Pontanus was a historiographer.

41. The 'Hague School' was a collective of artists who lived and worked in the Dutch city of The Hague from 1860 to 1890. These artists were inspired by the realist painters of the French Barbizon school, and their works generally featured natural landscapes and countryside life, often portrayed in sombre colours (Wikipedia, 2023 B).

to giving a new connotation to the expression 'town planning', which would later include also the term 'country' (van Rossem, 1993).
The plan is part of a long historical list of expansion maps, which includes the previously mentioned work of Daniel Stalpaert from 1662, and most notably, the fascinating but unrealised 'boulevards' depicted in Jacobus G. van Niftrik's map from 1866 (Hameleer, 2012).[42] Van Eesteren's work formed the basis for the post-war expansion of the city, which aimed to restructure the chaotic urban situation through the institution of a structural relationship of urban functions, mainly in terms of traffic organization.

A comparable territorial issue is faced by Benevolo in the Venetian Master Plan. The city had always protected the equilibrium of the lagoon just as a fragile ecosystem, but the 19th century brought about changes that altered this balanced setting and transformed the water territory into a vacuum. Benevolo (1996) uses a clever metaphor to describe the current state of Venice - "a hurricane at the centre of the Laguna which disperses the surroundings agglomerations". Because of that "the historical city is both privileged and penalised". As Cacciari suggests in the preface of *Venezia: il nuovo piano urbanistico*, the problem could only be solved by viewing the city in its metropolitan context, instead of an island trapped by its own waters. Benevolo's plan works precisely in this direction, aiming for a modern layout for the city in which the lagoon plays a fundamental role in articulating the environmental identity of the Venetian territory. The plan is based on the consideration that the water not only divides but also unites Venice and its surrounding settlements (Benevolo, 1996). Therefore, the Italian urbanist proposes an integration of these localities each having its identity through a structural development of the travel infrastructure connecting Venice, Mestre and all the islands of the lagoon as shown in the map.

The scale of the map is significant in both cases.[43] As shown in the schemes (fig. 17-18), the city occupies a minor portion of the drawing, with most of the space reserved for the representation of the territory. If not overturned, the hierarchy shared by de Barbari and Anthonisz disappears: the landscape is as influential on the city as the city is on

42. The plan, appreciated at the time of the proposal for its bold vision and grand design, shower a clear inspiration to the recent interventions of Georges Eugène Haussmann in Paris and 'the Ring' of Vienna (Hameleers, 2012).

43. Van Eesteren's map is drawn in scale 1:25000, the one by Benevolo in scale 1:15000.

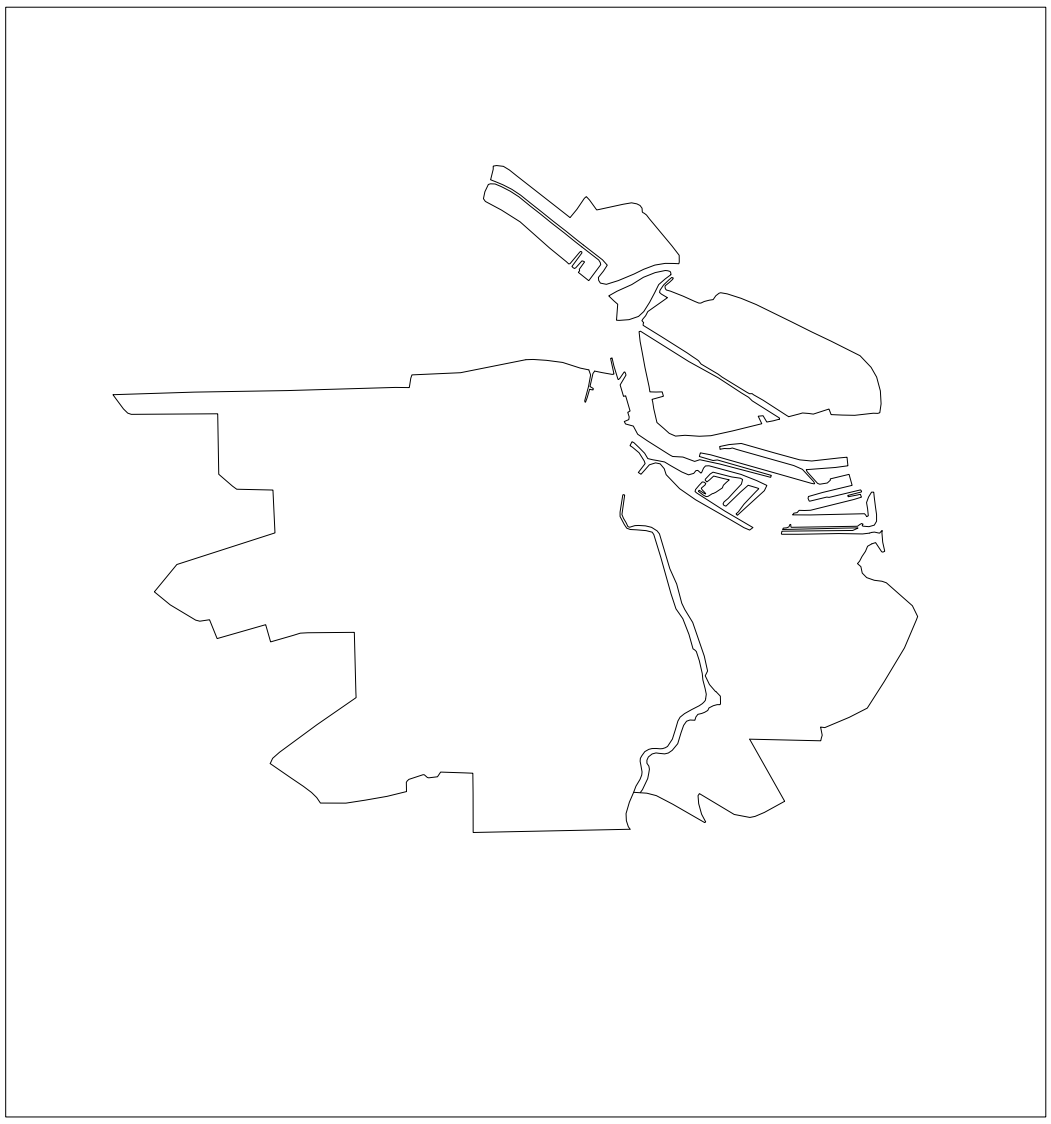

Fig. 17

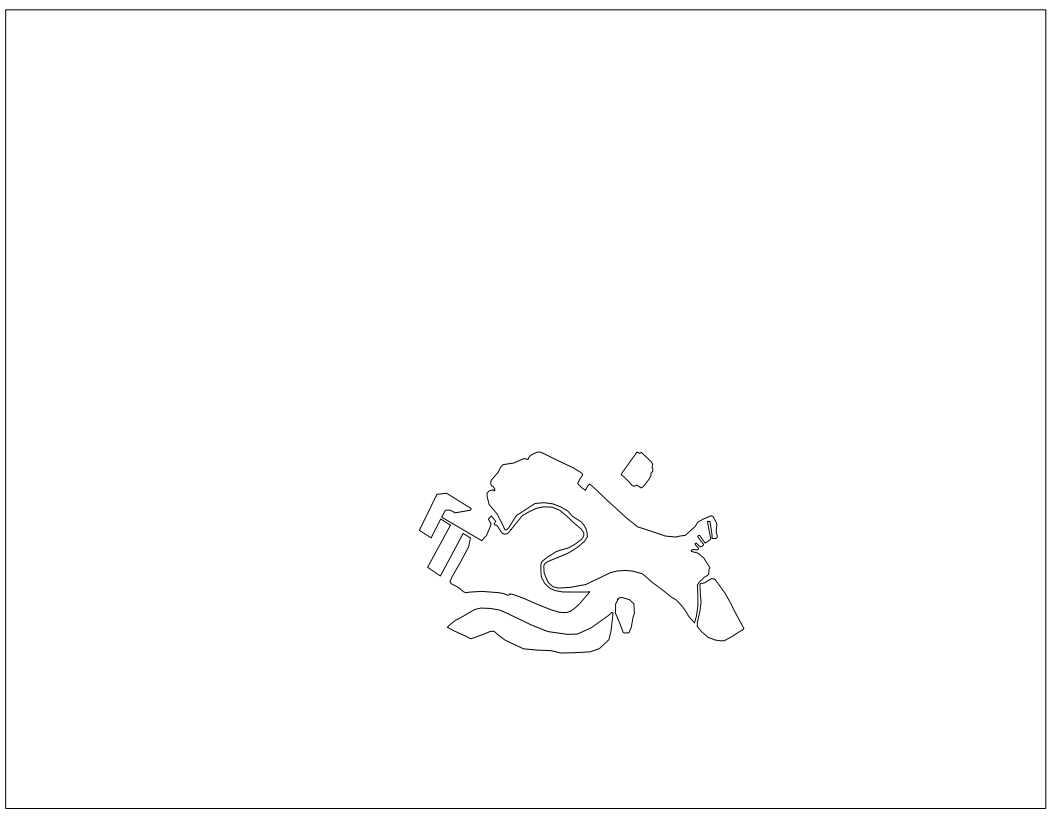

Fig. 18

Fig. 17 Scheme representing the portion of the map occupied by the city of Amsteradam in van Eesteren's plan.

Fig. 18 Scheme representing the portion of the map occupied by the city of Venice in Benevolo's plan.

the landscape. The two entities are portrayed in a one-to-one relationship from which both gain significance. This suggests the existence of one depends on the existence of the other.

The sense of colours

The considerations regarding the scale of the drawings are also important for the graphic representation. The zooming out of the plans by van Eesteren and Benevolo makes it impossible to depict the city with the same level of detail as in the previous maps. But this is not the point of the two Master Plans, which represent interventions of urban and even territorial significance. The individual buildings of Amsterdam and Venice are therefore condensed into the plots to which they belong, while the other parts of the cities are defined in shapes that describe areas of a different nature. To make these synthetic images clear and legible, symbolic colours are introduced in the maps.

In the foreword of the contemporary edition of Hogenberg and Braun's map atlas *Civitates orbis terrarum* from 1572,[44] Rem Koolhaas (2008) notes that in the ancient depictions of cities there are three recurring colours: "green – the land, red – the city; and blue – the water, with its promise of interconnectedness". The first and last colours are still used with the same meaning in the modern master plans by van Eesteren and Benevolo, including different shades applied to distinguish the different typologies of these green and water zones. If in these cases the colour still somehow relates to reality, this is not the case with the city, where the choice of colour becomes entirely symbolic. In the maps, the historical urban fabric is shown in black (Amsterdam) or purple (Venice), while red and orange indicate the areas for which the plans envisage a complete or partial re-evaluation. Not only these colours are not realistic like green and blue, but they are not even universally codified. Therefore, each drawing must be accompanied by a specific colour legend. This means that the map does not contain all the information necessary for understanding, but requires a supporting explanation. This is not surprising when one considers that a master plan does not consist of a single map, but of a multitude of maps and that the maps are only one of the document typologies that

44. Braun, G., Hogenberg, F., & Füssel, S. (2008). *Cities of the world : 363 engravings revolutionize the view of the world : complete edition of the colour plates of 1572-1617*. Taschen.

constitute a Master Plan, which includes also collections of data and statistics, diagrams and explanatory notes.

Finally, it is interesting to notice how the previously mentioned relationship between city and territory is depicted in both plans. The transportation systems putting in communication Amsterdam and Venice with their surroundings are clearly highlighted as they are the main theme in the respective city plans. Van Eesteren focuses primarily on the main road axes, which are depicted in a bold yellow, and on the railroad, which is represented by a mixture of continuous and dashed brown lines. Benevolo, on the other hand, draws attention to water routes in dotted lines and the Mestre-Venezia train line in red.

Despite their scientific precision, Master Plans represent in their graphic characteristics a step away from the pursuit of correspondence to reality typical of the previous city portraits. What is most significant about this type of map is that this deviation is deliberate. The use of unrealistic colours, which only hold meaning in the specific map, is a conscious graphic choice that only responds to the need to make a complex and articulated project easily readable.

5.

A diagramatic reality

The detachment from reality, which can already be observed to some extent in the case of Master Plans, finds its ultimate consequence in another type of map whose existence depends directly on the existence of the modern city: transit maps.[45] There is a fundamental difference between these two categories of maps, which is primarily due to the audience for which they are intended. While Master Plans serve as graphic support to explain design proposals for urban developments to technical and political decision-makers, public transportation maps are tools to be used by all kinds of users and should therefore be universally understandable. In order to achieve this goal, the representation of reality is usually extremely simplified, radically changing both the image and the perception of the city in the public experience. After a brief but necessary introduction to this new map typology using the famous example of Harry Beck's London *Tube map* from 1933, the chapter focuses on the impact that the application of the graphical rules introduced in the Lond example has on the *Waterborne routes* map of the vaporetto of Venice and the Amsterdam *Metrokaart*.

45. The first example of this map tyoplogy can be traced back as early as 1908 with the *London's District line*, even if several previous examples exist, representing in particular European and American railroad cartography. These maps date back to 1890s (Wikipedia, 2023 C).

Harry Beck and the London Underground

As Baricco (2017) claims, the parameter historically used to determine the success of a map is to be found in the number of copies made, which seems a logical assumption if we consider the difficulties hidden under the production of duplicates over the centuries. Sticking to this criterion, Beck's 1933 *Tube map* can objectively be considered the most successful map of all time, having been printed around half a billion times (Garfield, 2012). The interest in this map can be attributed to many aspects, but primarily to the efficiency with which it responded to a practical need. The London Underground had been in operation for seventy years when Beck designed the map, but for decades the infrastructure had been little used by citizens as a means of transportation. Indeed, the idea of travelling beneath the surface of the city led to a general unease with the Underground (Baricco, 2017). Several attempts have already been made to make it easier for people to find their way around the underground system through the realisation of differentmaps, which however always resulted in complicated interweaving of lines recalling the image of a 'spaghetti plate' more than a map, such as in Fred Stingemore's interpretation from 1928 (Garfield, 2012). The Underground company was struggling to overcome this mistrust on the part of Londoners when in 1931 Harry Beck, a regular employee at the London Metro Signal Office, presented by his own initiative a sketch of the future map, inspired by representations of electrical circuits (Garfield, 2012). Although rejected initially, the proposal was later developed in the 1933 Tube map.

Baricco (2017) describes Beck's work as a sum of five apparently unreasonable but genius moves, through which the author succeeded in making the map easily readable for everyone.

1. Beck does not consider the actual paths of the subways but simplifies them by introducing just two angles according to which the lines turn: 90° or 45° (fig. 19). The use of these two clean and natural angles clarified the confusion of the previous maps.

2. All the distances between the underground stations are reduced in the map to the same unit. This move had a particular psychological effect on the citizens as it depicted the outskirts way closer to the centre of London than in reality, concentrating the urban system and consequently contributing to creating a spirit of the city.

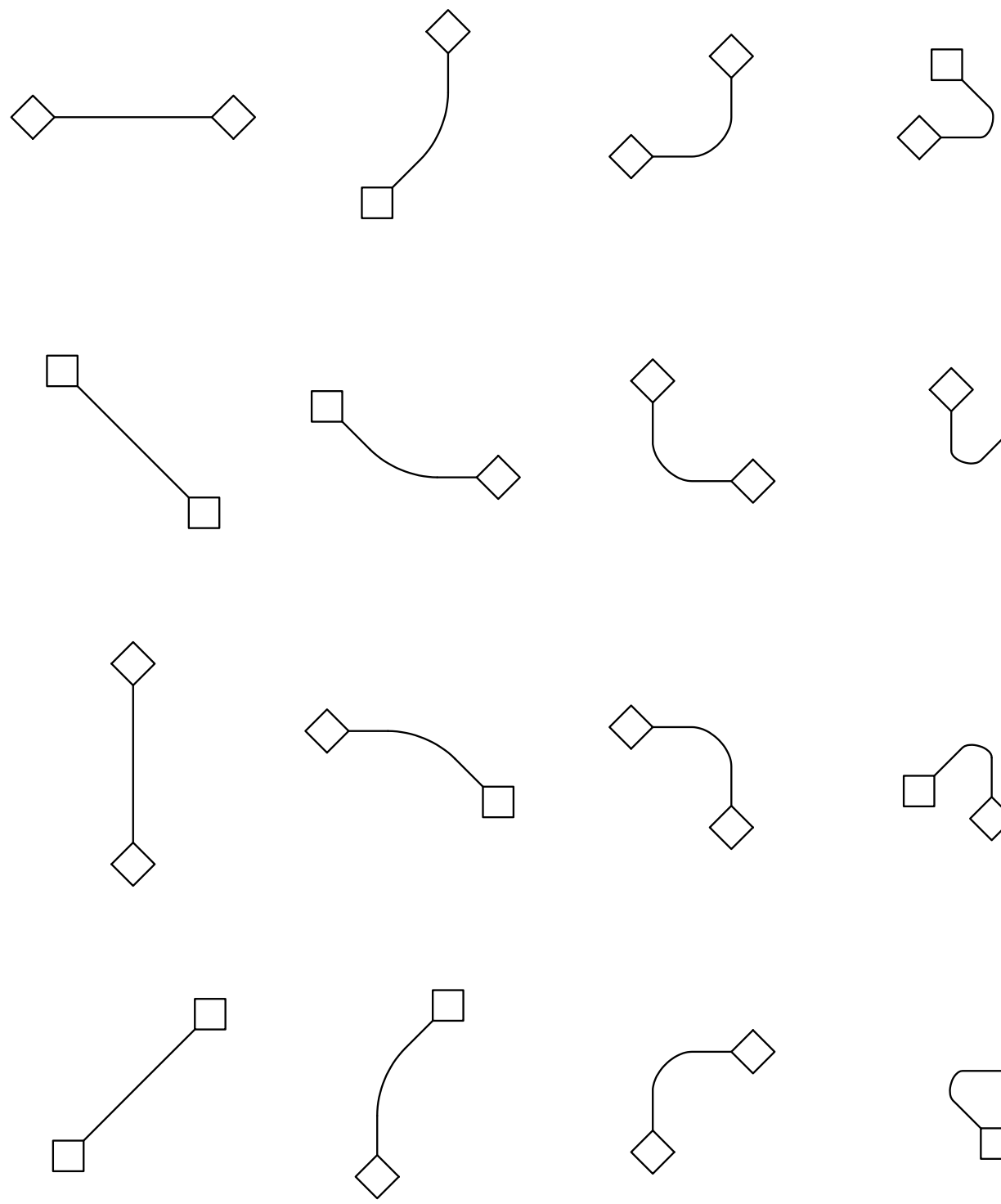

Fig. 19

Fig. 19 Abacus of the angles used by Beck as the drawing principles for the realization of the *Tube map* of London.

3. The river Thames is represented as a thick line following the same angle rules as the path of the subway. The waterway remains on the map as the only symbol of London.

4. The city surface completely disappears and therefore every landmark for people to orient is removed (exception made for the Thames).

5. The Underground system is organized around a central horizontal axis or spine which does not exist in reality but helps to read the drawing.

The five points are combined in the realization of the map with the use of symbolic colours to distinguish the different metro lines (just as in the Master Plans with the areas of the city) and a plain and readable lettering font.

All these actions can be summarized as a conscious movement made by the author: stepping back from reality, Beck finds himself in a position in which he can reconstruct a new clean and synthetic image to clarify reality (Baricco, 2017). As Garfield (2012) notes, the London *Tube map* presents all the characteristics – simplicity, coherence, balance, harmony – that the professor of psychology Maxwell Roberts suggests to be the defining elements for all the best graphic representation, except for one – topography. Indeed, Beck's work embodies the triumph of a general diagrammatic representation over a particular geography and therefore it can be universally applied.

Venice and Amsterdam reshaped

Another way to measure the success of something is to look at how much influence it had on what came after. Under this other guideline, Beck's map would still claim primacy as the most successful map ever made. In fact, the graphic code developed by Beck appeared so clear and convincing that it became the basis not only for future London Underground maps but for every public transport map around the world. This statement is valid regardless of vehicle typology, therefore including the map for the Amsterdam subway as well as that of the ferry in Venice.

Both transport systems have a history of over a hundred years (at least in terms of their conception),[46] and therefore they have been portrayed in various differentof their relative maps. However, in the interest of

the thesis argumentation, the following analysis will only focus on the most recent ones, which coincide with the maps currently in use: the *Waterborne routes* map of the Venetian vaporetto by Actv (Azienda del Consorzio Trasporti Veneziano) and the Amsterdam *Metrokaart* commissioned by the Amsterdam metro society GVB to the Dutch design consultancy Mijksenaar in 2019.

Before proceeding with the graphic examination of the drawings, it is relevant to point out that the public transport maps represent a further step in the process of de-identifying the map with the author, already seen in the examples of van Eestern's and Benevolo's Master Plans. As these were the result of teamwork, the vaporetto and metro plans are recorded as products of companies, rather than o map-makers. But if it were a matter of naming a single designer, it would be fair to say that Harry Beck can be considered the author of these maps as well as all other transit maps realized according to his graphic rules.

The rigorous application of the 'London Tube' code to the maps of Venice and Amsterdam results in two different types of distortion of the city images. In the Venetian case, Beck's angle rule schematizes the shape of the city geometrically: the silhouette of the urban surface, coloured in the map in grey, is defined by the diagrammatic paths of different vaporetto lines. This device does not only alter the perimeter but also the proportions and distances between the different parts of Venice. The most striking evidence of the distortion is seen in Canal Grande, which appears much thicker on the map than in reality, as it hosts four different routes (fig. 20-21).

There are multiple versions of the Amsterdam Metrokaart. In the official map found on the GVB website, the coloured metro lines are overlayered on a synthetic plan of the city, with grey, green and blue distinguishing the urban fabric, the green areas and the water. However, the metro map is also diffused in another version which only displays the four subways without any indication of the city (fig. 22-23). Unlike Beck's Tube map, which included the river Thames as a sym-

46. The first vaporetto, named "Regina Margherita", appeared on the Grand Canal of Venice in 1881 as an experiment. After that, a French company, "Compagnie des bateaux Omnibus", established in Paris, was granted the concession to operate the Grand Canal line until 1890, when the Società Veneta Lagunare took over the duty (Actv, n.d.).

Regarding the Amsterdam case, the first plan to build an underground metro dates back to the first decades of the 20th century, precisely 1922. However, the actual construction of the subway system only became feasible in the City Rail Plan of 1968 (Hameleers, 2012).

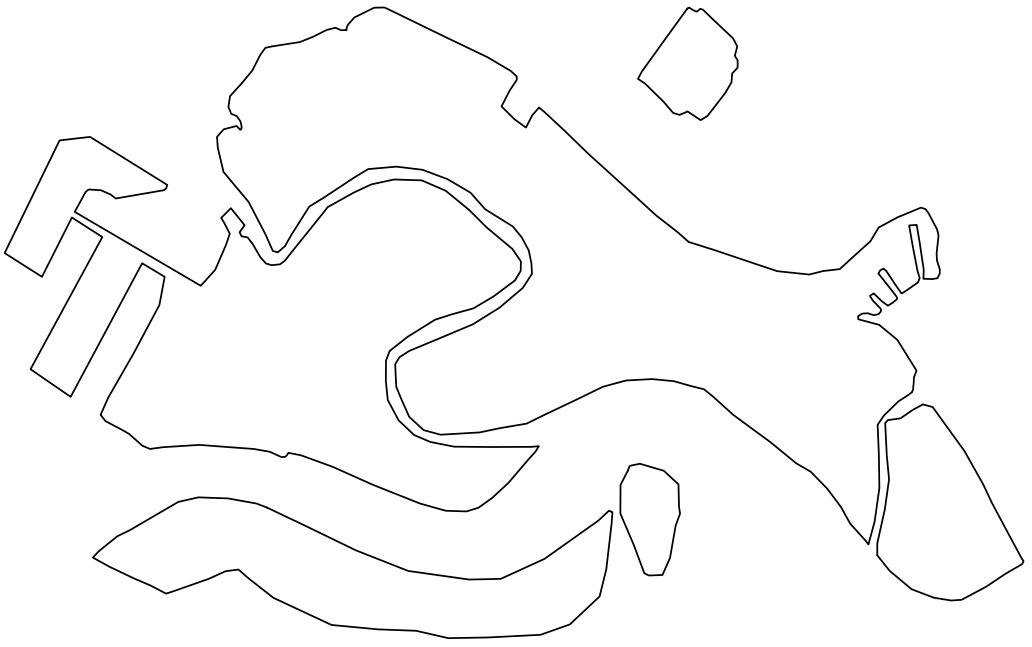

Fig. 20

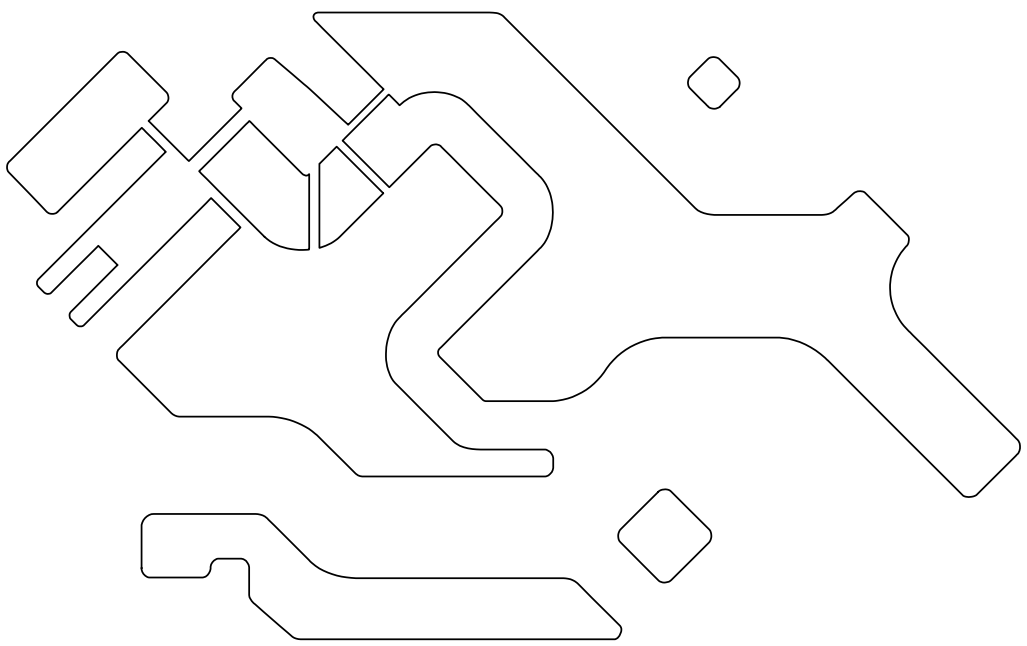

Fig. 21

Fig. 20 Shape of Venice in Benevolo's plan.

Fig. 21 Shape of Venice in the *Vaporetto map*.

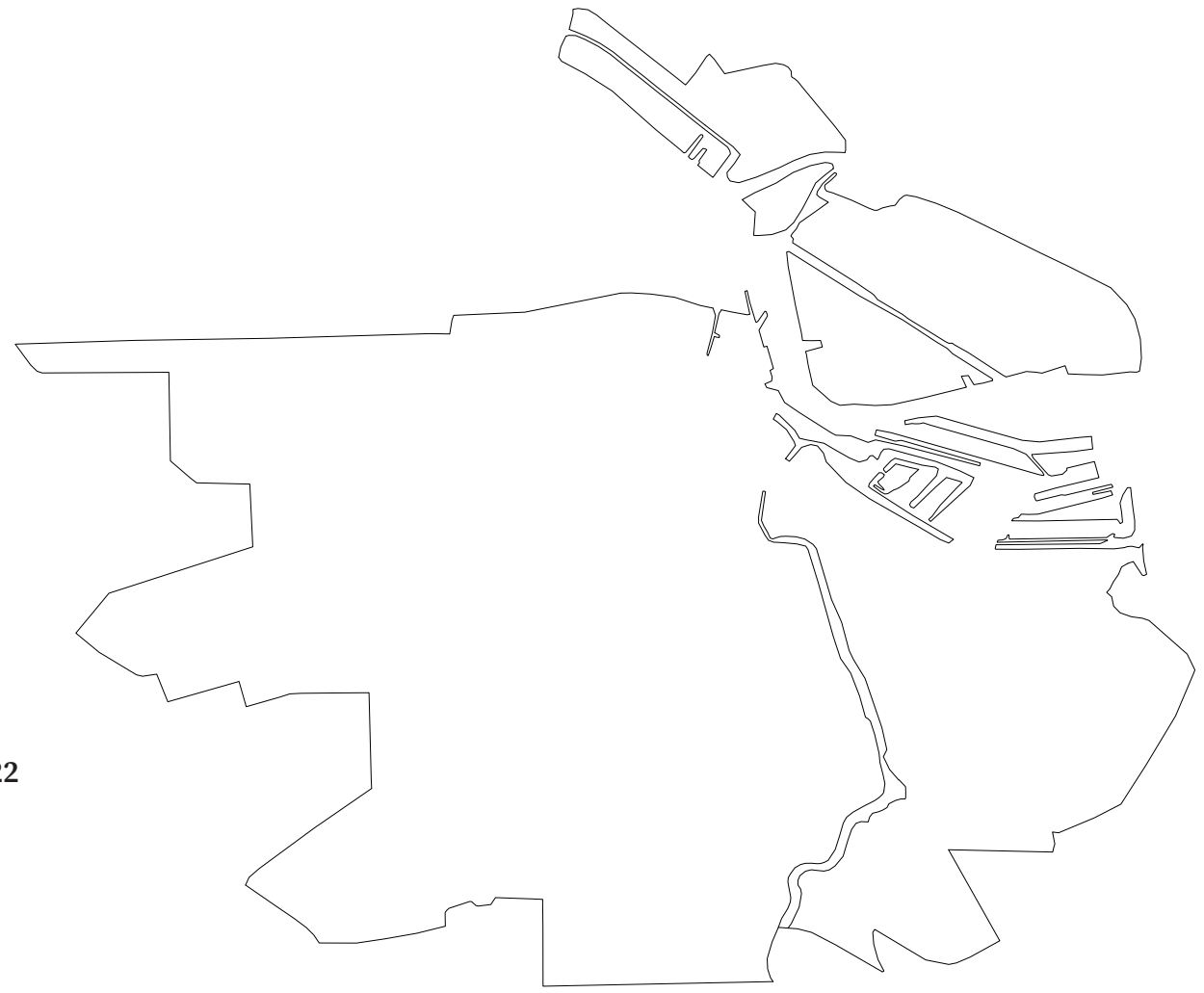

Fig. 22

Fig. 23

Fig. 22 Shape of Amsterdam in van Eesteren's plan.

Fig. 23 Shape of Amsterdam in the *Amsterdam metro map*.

bolic element of London, this Metrokaart does not portray either the IJ or the Amstel. From a strictly logical point of view, the decision to not represent any urban component is consistent with the nature of the drawing. Indeed, a plan is nothing more than a horizontal section and since the section plan is positioned beneath the surface of the ground, nothing of the city should be represented in the map.

Among all the maps considered in this thesis, the public transportation typology is the one that most evidently takes a deliberate distance from truth as defined by Russel. Just as de Barbari's *Venetie. M.D.*, Beck's *Tube map* can be considered another crucial 'rip' in the history of cartography since it indicates a new method of representation that only considers the data-transference power of a map. In transit maps the user's understanding of the information influences the representation of the information. This principle transforms the nature of the map itself from a map to a diagram, resulting in the simplification of the city image to an elementary state, if not erased, to facilitate the process of information transmission.

6.

Conclusion

Through the analysis of the five pairs of maps presented in the respective chapters, a partial story of the last 500 years of Venice and her "northern sister", Amsterdam, has been traced. Over these five centuries, both cities have evolved significantly, albeit in different ways, from their medieval urban layout to their modern configuration. Along with the physical and tangible transformations, the city images have also changed, leading to modifications in the way they have been portrayed.

Generally, two tendencies can be identified in our brief history of maps: a first moment when the map-maker seems to focus on rendering a complete image of the city (exception made for the extremely modern works of Sabbadino and Pontanus), and a second one in which the map is progressively simplified in the depiction of the urban elements. It is curious to notice that these trends have in their succession an opposite course to the technological evolution. In the past, when the lack of technology did not allow map-makers to achieve perfect correspondence to reality, the map tended to pursue that accuracy. In more recent times, technological development has made this goal reachable, but at the same moment we notice that the aim of the modern map has shifted away from the historical strive for completeness of the city image.

All in all, perfect correspondence to reality is not fully achieved in any of the maps analysed in this thesis. However, this does not alter the communicative effectiveness of the maps. In fact, every unrealistic element in the representation conveys relevant information. This applies to the distorted landscapes of de Barbari and Anthonisz, introduced to suggest the influential power of Venice and Amsterdam on their surroundings, alongside all the symbolism. Sabbadino and Pontanus simplify the urban structure of the two cities and use graphical devices to distinguish between existing and future scenarios, while van Berckenrode enriches his drawing through allegories and personifications, carefully explained in specific cartouches, the use of which Merlo shares. Finally, the plans by van Eesteren and Benevolo feature unnatural colours in the representation of urban areas subject to various interventions, and the diagrammatic abstraction of the transit maps clarifies the routes of the Venetian vaporetto and the Amsterdam underground.

The most important observation that emerges from the preceding enumeration is that all the graphic choices mentioned are *deliberate* actions of *distancing from reality* by the authors in order to add meaning to the map or make the meaning of the map more comprehensible. This implies that *true information* is illustrated through *untruthful representations* of it, just as if a bit of falsehood were needed to explain truth.

The previous statement is clearly paradoxical at its core, yet extremely logical. The image of the city does not require to be necessary in order to convey what the map wants to convey; indeed this perfection could cause confusion, as argued in the introduction to this thesis. A map only needs to recall reality in order to fulfil its role as an effective transmitter of information, which is in fact its primary purpose.

The relationship between reality and its representation in maps, therefore, may not lie in correspondence, but in another philosophical concept: *coherence*. The coherence theory of truth denies that something "is true because it represents the intrinsic features of reality" (Lynch, 2001). Instead, it states that the validity of a belief arises from its *accordance with reality*. In the case of maps, this means that a true representation must not deviate too far from the existing reality. As said, the drawing should resemble the real configuration of what it portrays to enable the user of the map to orient themselves.

One last question is still pending, and it relates to how the reality-appearance relationship may affect the perception of the map. Distortions in the map can alter our spatial understanding of the city, as in the case of Beck's *Tube map* and its effect on reducing the distances of the London centre and outskirts. However, it is clear that no one would ever believe that Greek gods inhabit the Venetian lagoon, that the historical urban fabric of Amsterdam is all black, or that the perimeter of Venice only follows regular angles. This is due to the power of our imagination, which, based on real-life experience, allows us to distinguish the nature of each *sign* in a map, whether it is related to the *true appearance* of the city or stands as a *symbol* introduced for communicational purposes.

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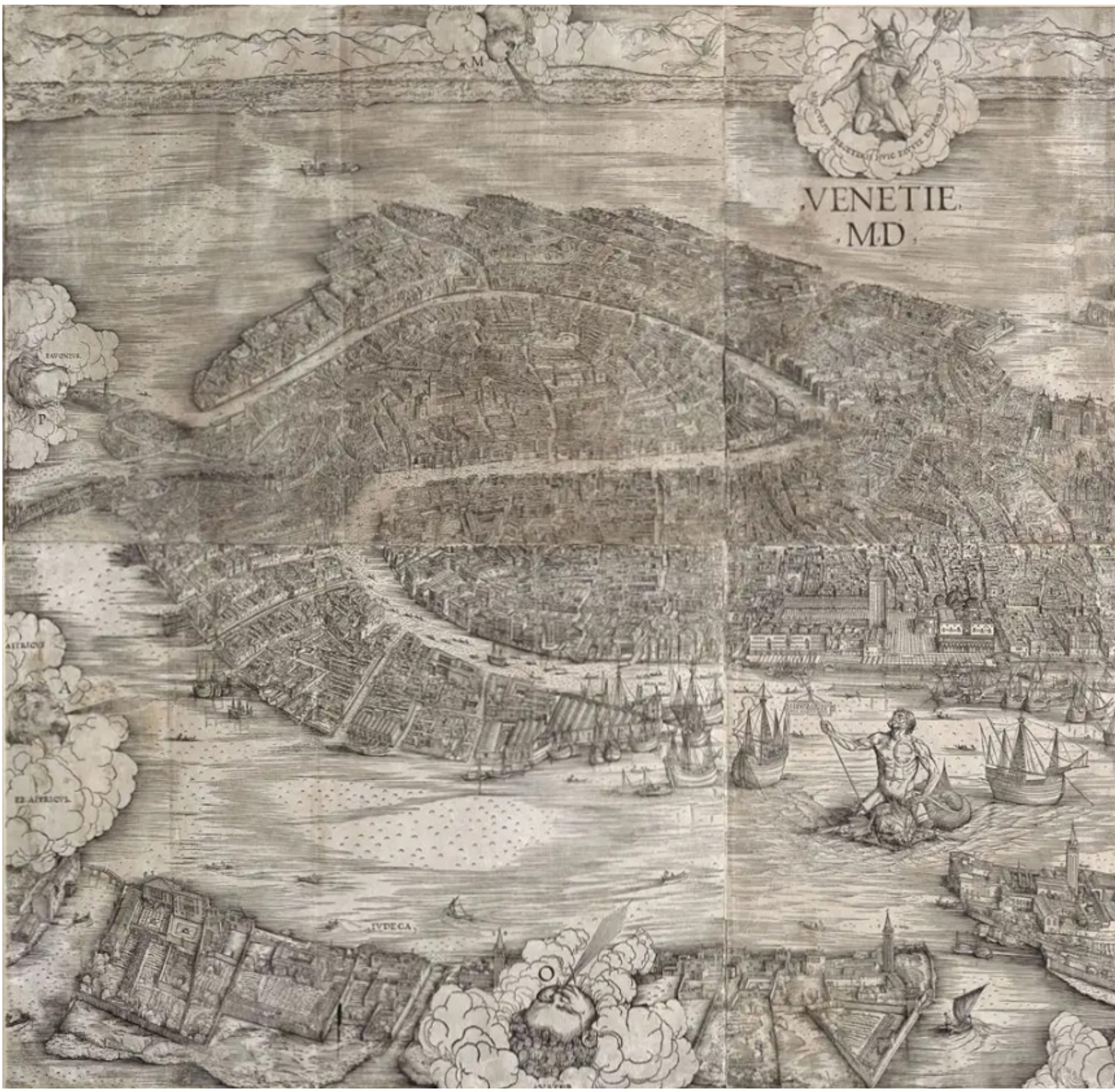
Plates



1. **Jacopo de Barbari,** ***Venetie. M.D.*** **1500.**

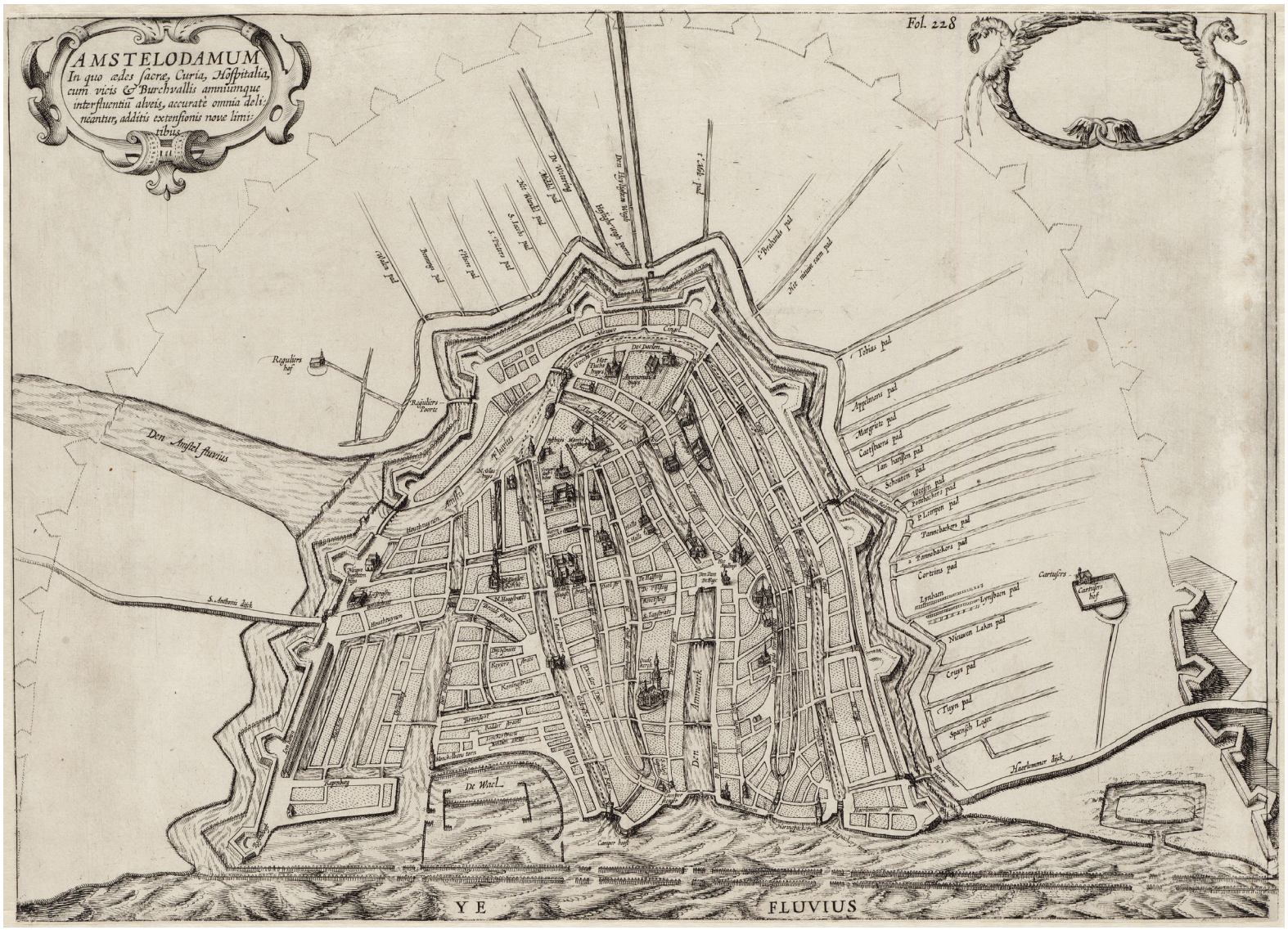
Chapter 1.

2. **Cornelis Anthonisz, *Map of Amsterdam*. 1544.**

3. **Cornelis Anthonisz, *Bird's eye view of Amsterdam*. 1538.**

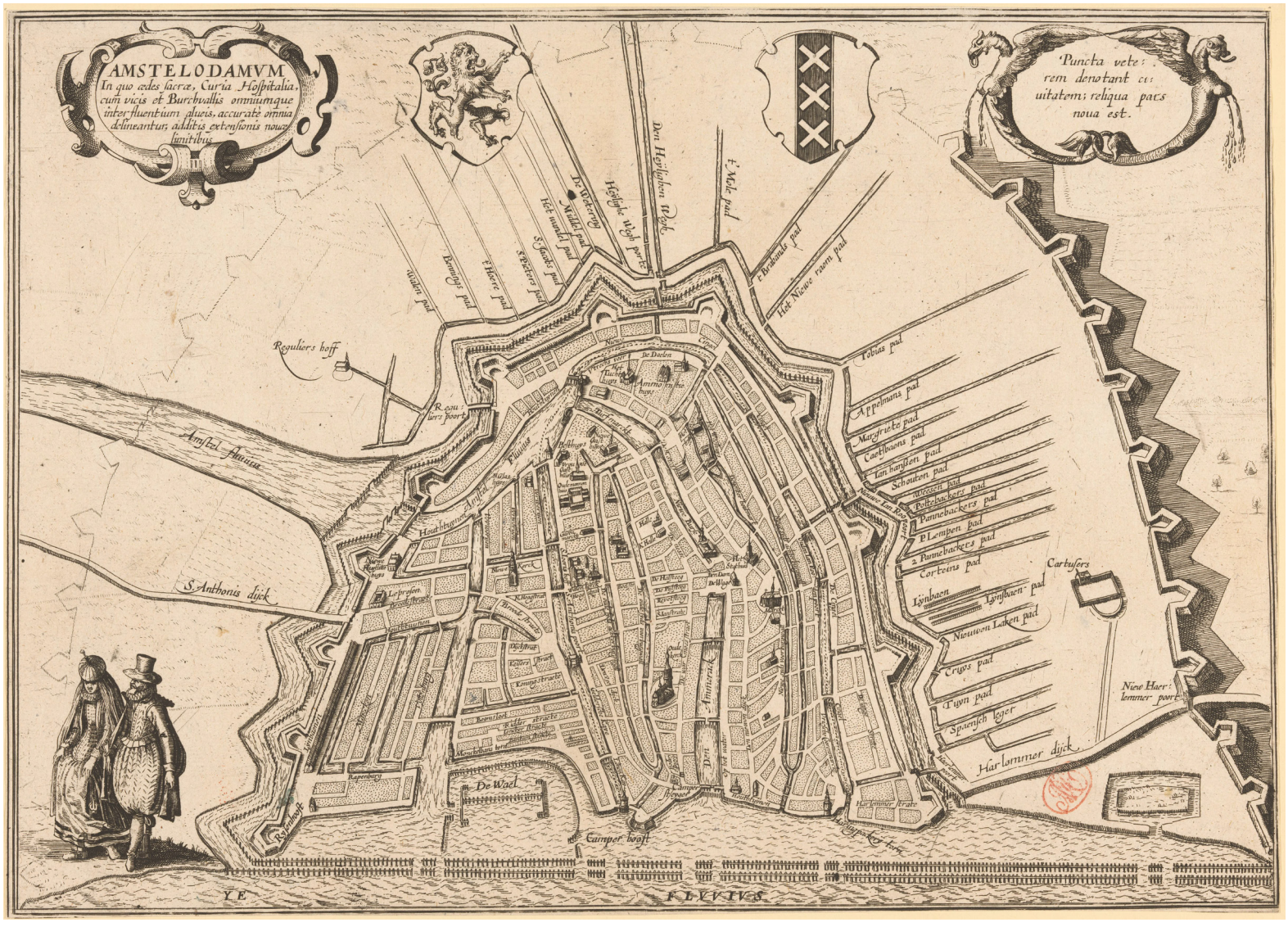
4. **Cristofo Sabbadino,** ***Mappa di Venezia*****. 1557.**

Chapter 2.

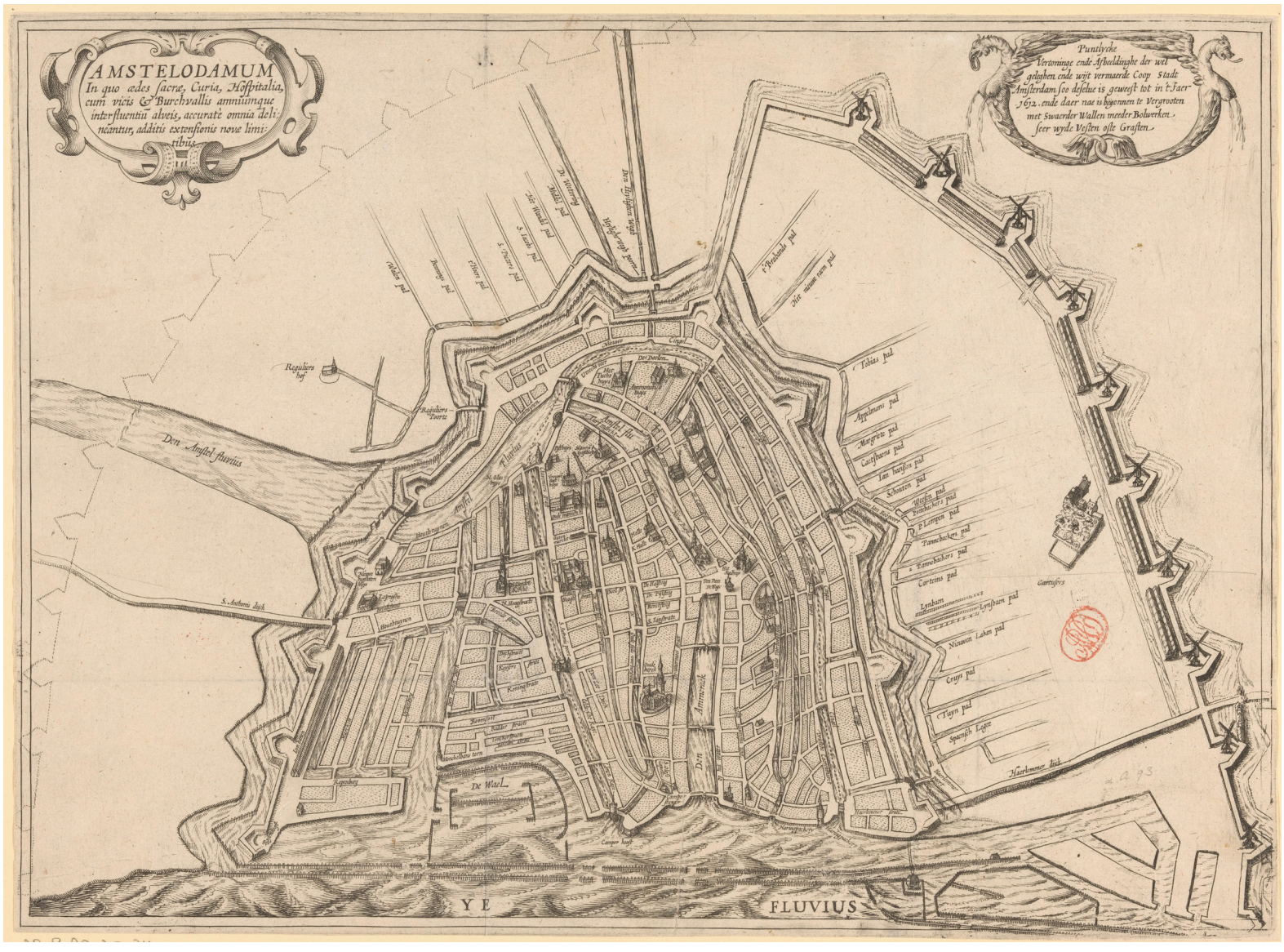


5. **Johannes Isaac Pontanus,** ***Map of Amsterdam*****. 1611.**

6. **Fra' Paolino, *Pianta di Venezia*. 1346.**



7. Johannes Isaac Pontanus, *Map of Amsterdam*. 1613.



8. **Johannes Isaac Pontanus,** ***Map of Amsterdam*****. 1614.**

9. **Joaen Blaeu,** ***Map of Amsterdam*****. 1649.**

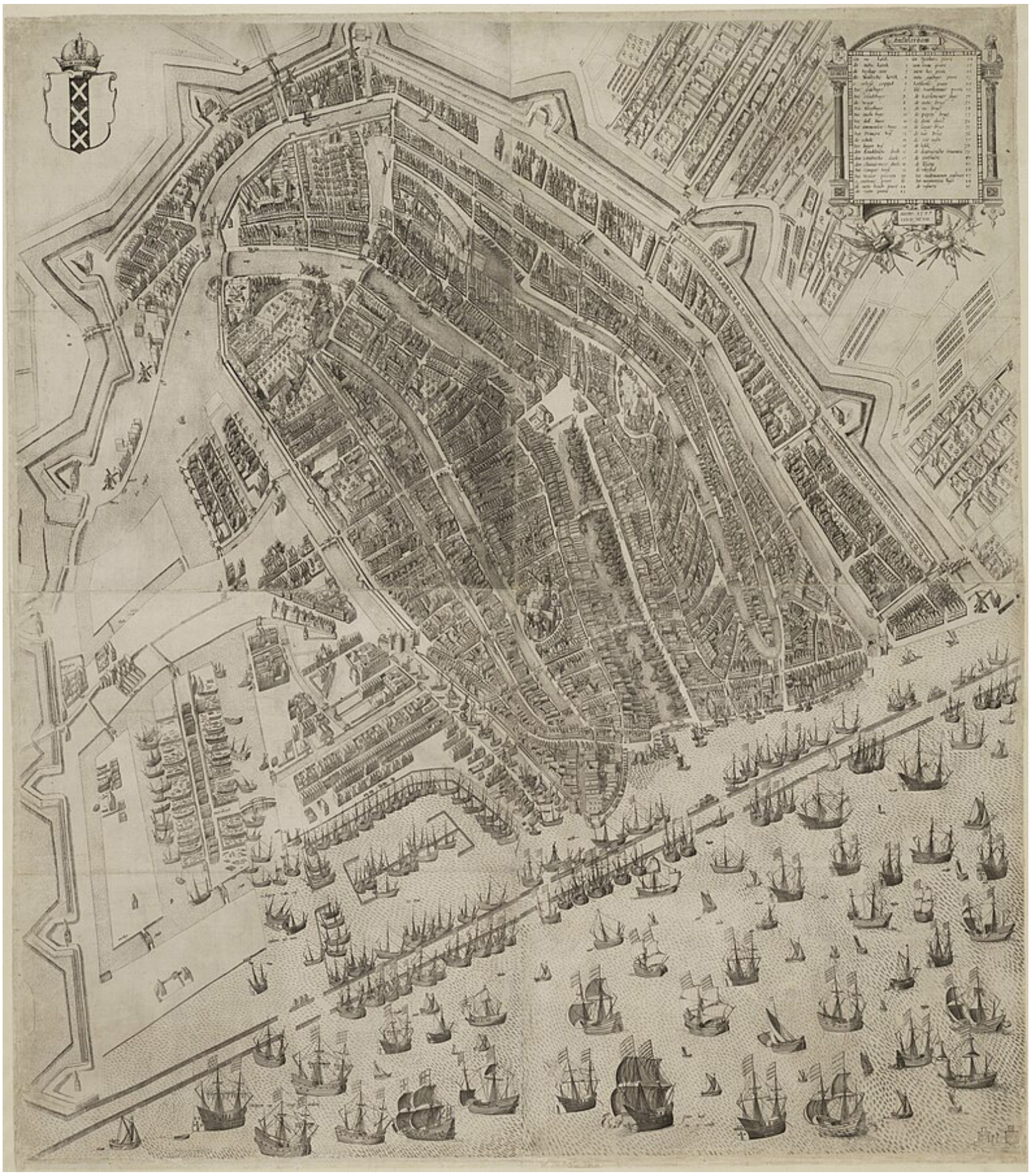
10. **Daniël Stalpaert,** ***Map of Amsterdam*****. 1663.**

11. **Giovanni Merlo,** ***Vero e real disegno della inclita cita di Venetia.*** **1676.**

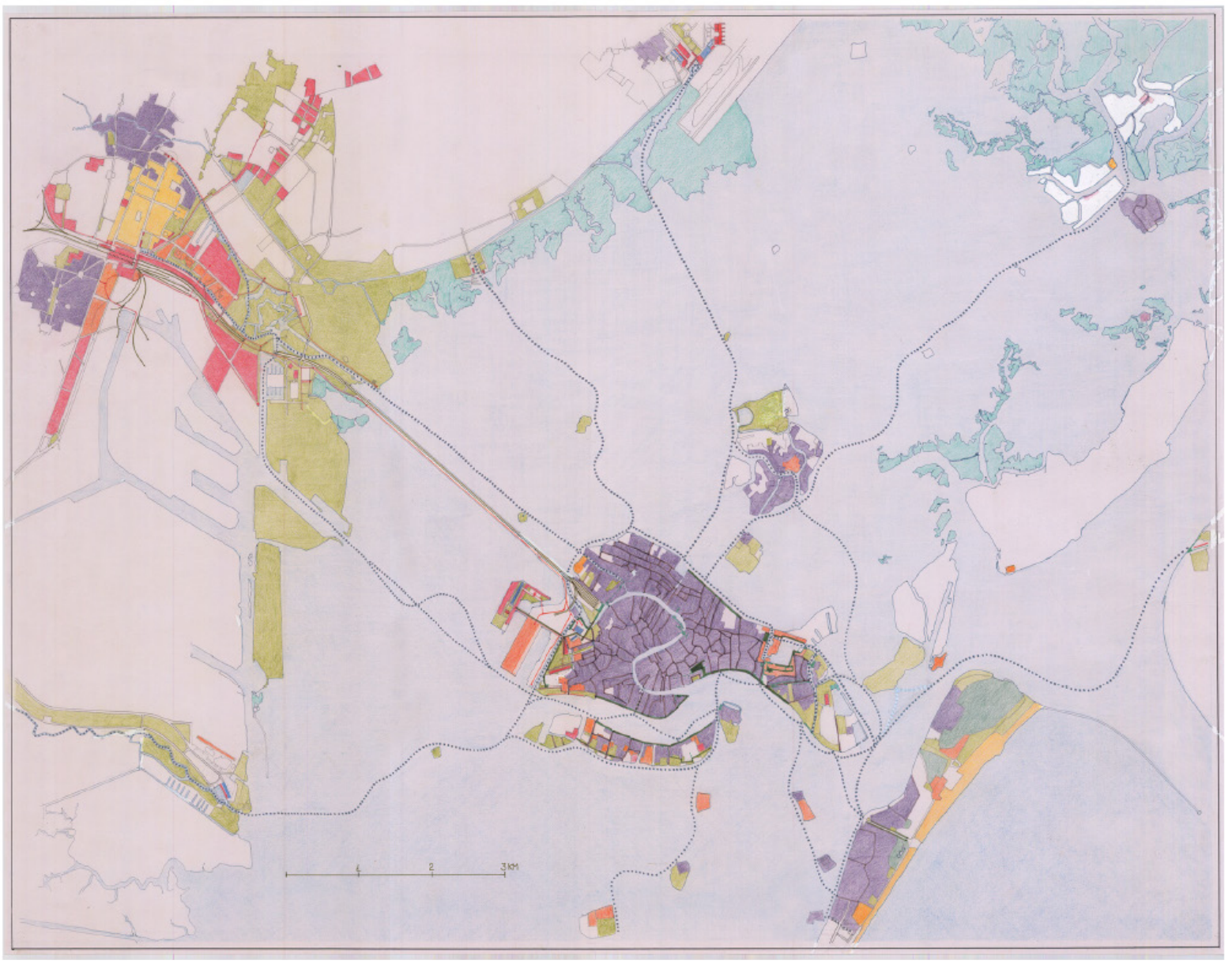
Chapter 3.


CLITA CITTA DI VENETIA
TRAMONTANA
MVRAN
Torcello
Burano
Mazorbo
ARSENALE
LEVANTE

12. **Balthasar Florisz van Berckenrode,** ***Amstelredamum Emporium Hollandiae*****. 1625.**



13. **Pieter Bast,** ***Map of Amsterdam*****. 1597.**



14. **Leonardo Benevolo, *Variante generale al PRG*, Venezia. 1994**

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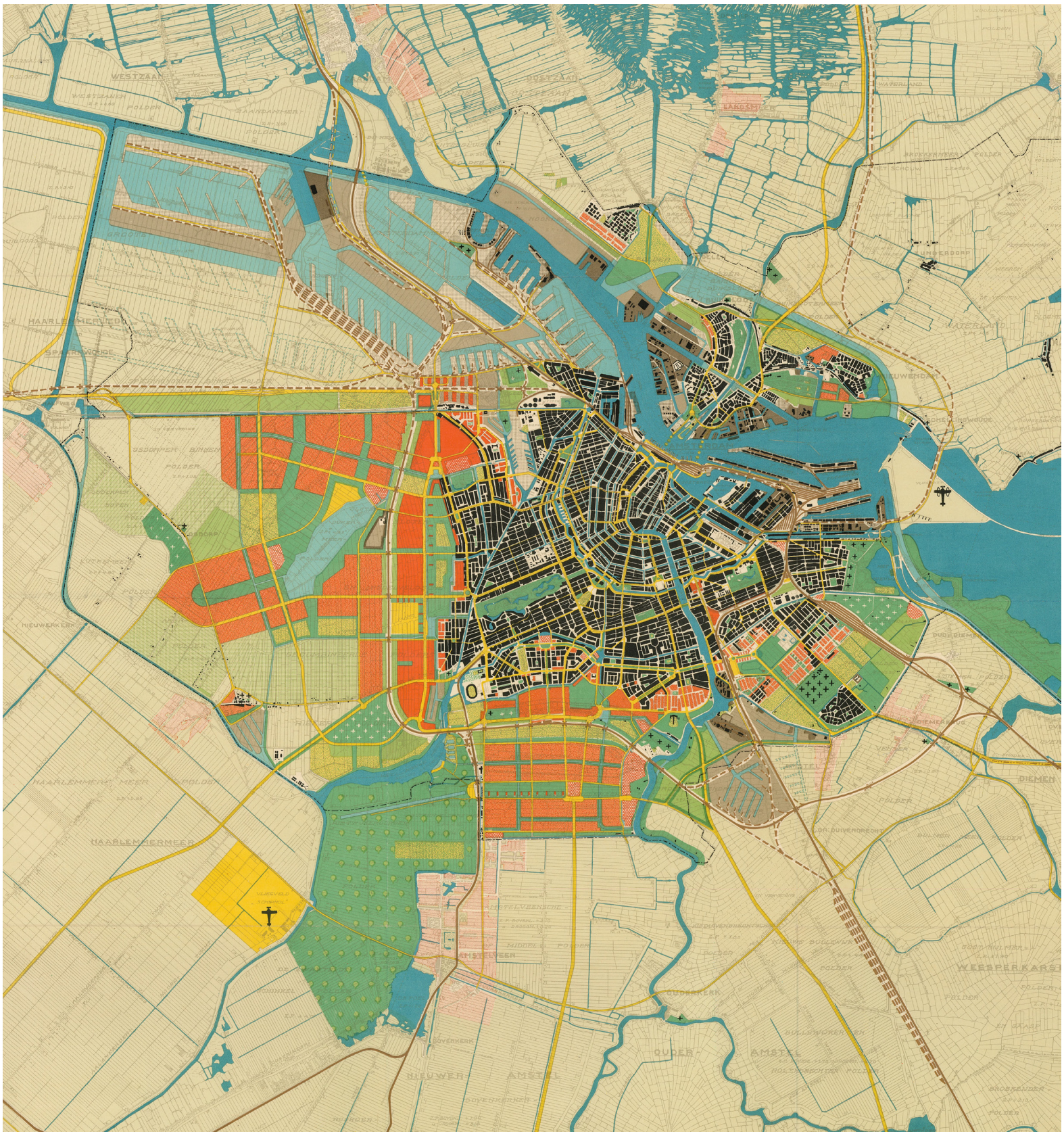
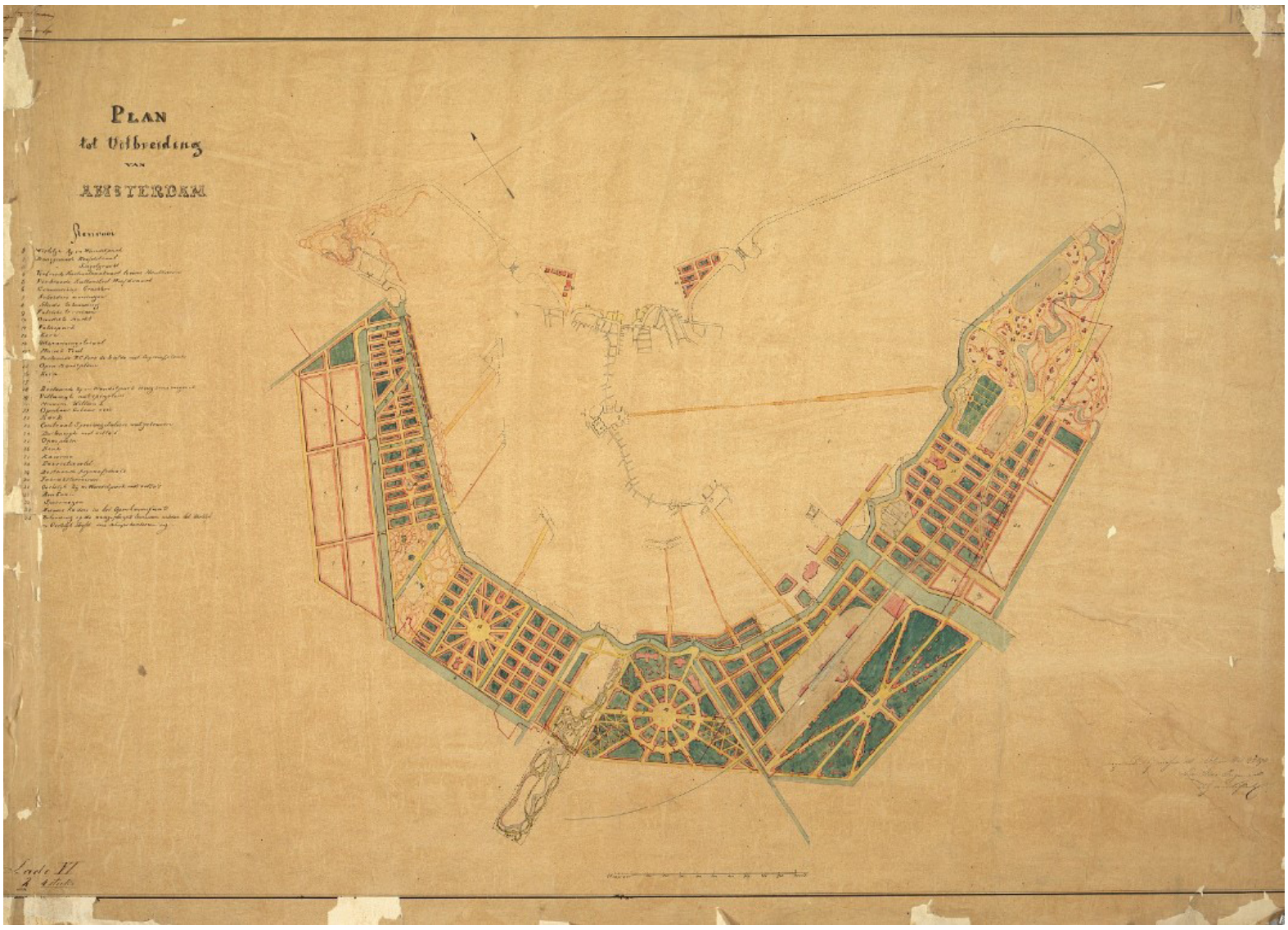


15. **Cornelis Van Eesteren,** ***General Expansion Plan for Amsterdam*****. 1935.**



16. **Jacobus G. van Niftrik,** ***Plan tot Uitbreidingsplan van Amsterdam*****. 1866.**

17. Actv, *Waterborne routes*. Venice vaporetto map.

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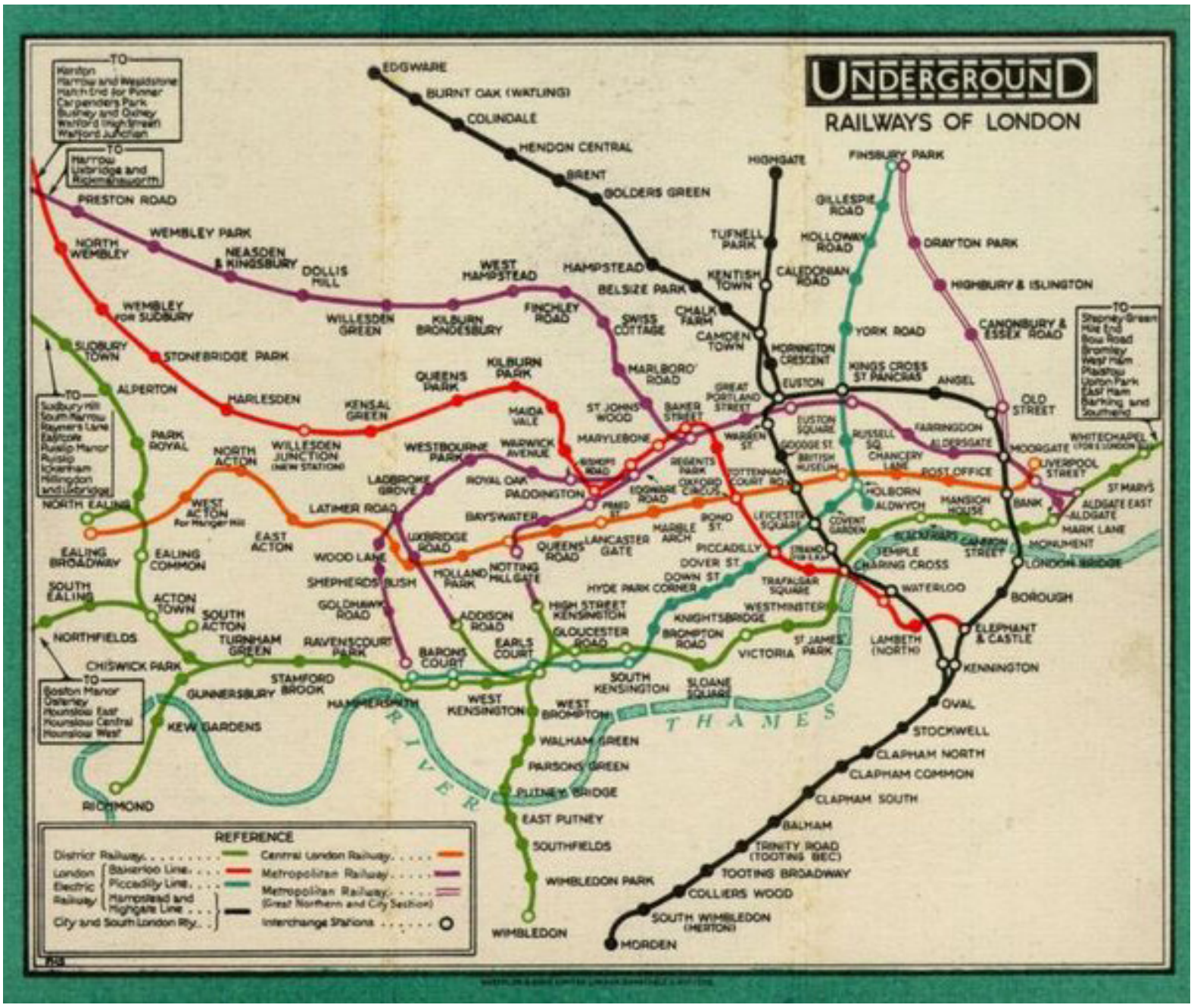
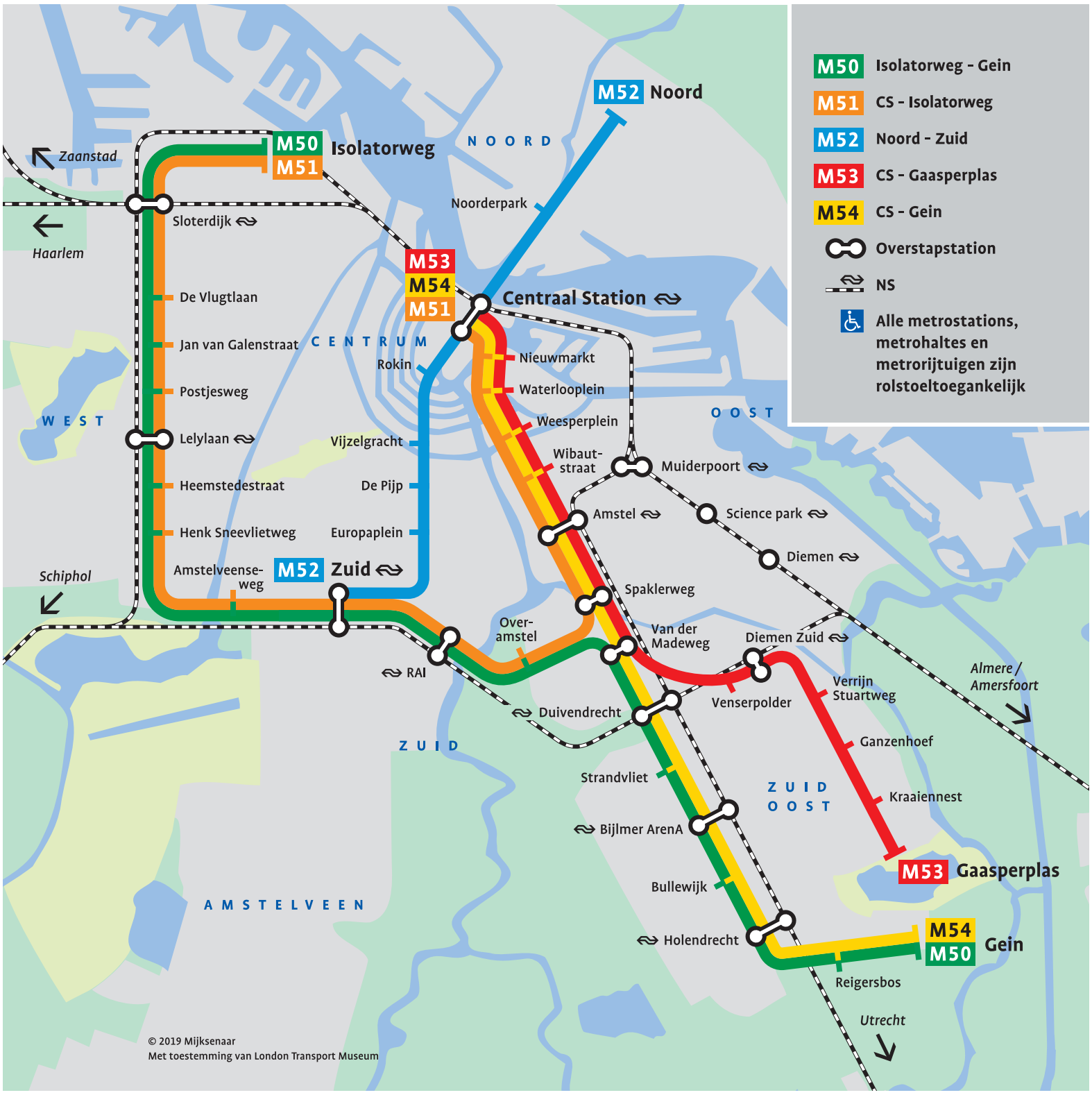
18. *Metrokaart*. **Amsterdam metro map.**

19. **Harry Beck, *Tube map*. London Underground. 1933.**



20. **Fred Stingemore,** ***Underground Railways of London*****. 1928.**



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