

VM408 folio86v ‘The Rosette Map’: Elements of a *Mappa mundi* and a map of the Elements

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Introduction

The Rare Manuscript Library at Yale keeps MS408 which is better known as the Voynich Manuscript named after Wilfried M Voynich, who rediscovered it in an Italian monastery in 1912. This manuscript comprises a collection of folios with yet undeciphered text and multi-faceted images. Amongst these are depictions of plants highlighting a botanical or pharmaceutical background, nude women and astrological imageries.

Historians and Laymen alike have tried to understand its images and texts over the hundred years since its rediscovery. Many attempts using different techniques to unravel its coding were made, however, to no avail. The continuing unsuccessful attempts to unravel the contents even led to a hypothesis that the Voynich manuscript ‘must’ be fake, based on textual and statistical analysis (1). Rugg provided a way and technique to fake-produce a ‘senseless’ manuscript seemingly effortlessly in a very short time in the style of the Voynich manuscript (2).

The question of when this manuscript was produced has also been widely discussed, and remained unresolved so far. A recent chemical analysis based on radio carbon dating sets the date of production of the parchment in the early 15th century (1408-1434) (3). This date was previously predicted by N. Pelling’s independent approaches and evidence based on details in the images in the manuscript. N. Pelling’s book provides an exhaustive amount of details on the Voynich manuscript (4).

Of the multitude of sections with botanical, astrological or pharmaceutical imagery one section did not catch the attention and focus so far: The Rosette Map (f86v), named by Mary d’Imperio according to its appearance (5) is one of the most intriguing but also most neglected area of the manuscript. Plenty of speculations exist for the display of details of individual geographic locations in the Rosette Map (Venice, Naples, Pompeii, Tuscan Renaissance gardens), however, no cohesive analysis of the entire map has been published to date.

Cartographic depiction of geographic locations in medieval maps was achieved with so-called *mappae mundi*. These vary in many details (e.g. size, shape, orientation, captions) depending on their use. Huge maps for visualisation and for purposes of presentation e.g. the Hereford map or the

Ebstorf map (3m diameter) are in total contrast to small T-O maps which were often used as appendices (e.g. commentaries of the *Dream of Scipio*) for illustrative purposes. Furthermore the use and annotation of cities in medieval maps varies considerably, although usually major cities of religious and political importance are included such as Rome, Alexandria or Constantinople. A categorisation of existing medieval maps was first achieved and reviewed by Konrad Miller (7) and more recently reviewed by Evelyn Edson (8). Several branches and types of maps exist that combine the geographic knowledge with other components, e.g. wind climate zones or cardinal points. Others contain pictures of apostles and saints (e.g. Osma map <http://www.henry-davis.com/MAPS/EMwebpages/207H.html>).

The focus of our paper is the comprehensive visual analysis of the features of the Rosette Map f86v and, according to the knowledge of the authors, the first full comparison with other surviving contemporary folios and *mappae mundi* of the medieval age.

Analysis

Folio f86v (6) contains 9 circular shaped discs, with a central disc slightly bigger than the others (Figure 1). It is easy to see why the folio was called ‘Rosette map’ by Mary d’Imperio (1978) in her report (5, page 21). The nine non-identical discs are placed in a 3x3 grid pattern displaying a square matrix.

The intermittent discs (E1 to E4) are linked to the central disc revealing a cross-like structure. M1 to M4 and E1 to E4 are also connected via band or ribbon like structures to form a square with discs M1 to M4 in the corners. For reference and comparison in this paper, the individual discs are numbered for easier identification (see Figure 1).

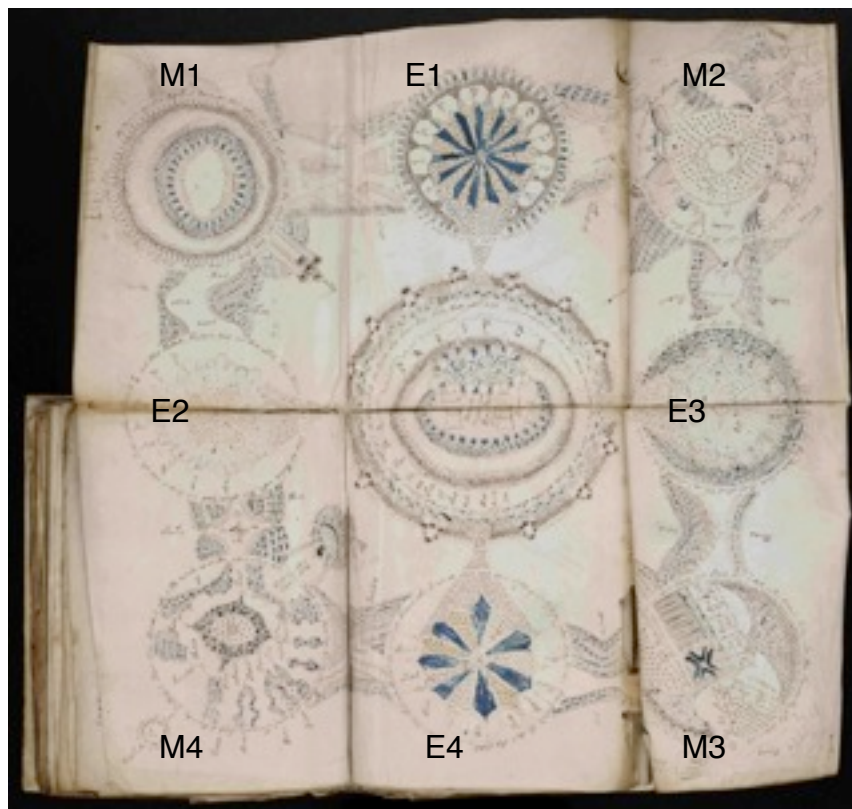


Fig 1: Folio86v of the ‘Rosette Map’ (VM408, Yale University Rare Manuscript Library)

A 3x3 pattern of nine discs. The corner and intermittent discs are labeled M1 to M4 and E1 to E4 respectively. Image with permission (6)

Individual details of this folio were used to illuminate the meaning of f86v: For example the detailed structure of the castle in M2 contains “swallow-tail” merlons which were used on buildings in Northern Italy (N. Pelling, 4): This led to the conclusion that Northern Italy is the most likely place of origin of the manuscript (and vital for determining the time the manuscript was produced). However this and other theories (e.g. M1 displaying Pompeii, M3 displaying an Italian Renaissance garden) only gave a partial analysis of single features and no characterisation so far led to a comprehensive picture or satisfactory explanation of the content of the entire Rosette Map.

The city landmarks

The aforementioned castle received the most attention due to its characteristic swallow-tail merlons (M2, Fig 2a) which narrow down the location to Northern Italy as revealed by Nick Pelling (4). The depiction of cities in *mappae mundi* vary, however, characteristic features of cities were frequently used to symbolise these and make them easily recognisable. A visual overview of the folio86v reveals three potential mayor city landmarks (Fig 2 a-c) identifiable by tower like structures and buildings:



Figure 2 The city landmarks

2a-c) detail f86v

2d) Drawing of the Alexandrian Pharos by archaeologist Hermann Thiersch (1909) and

2e) <http://www.personal.psu.edu/mjy5021/lighthouse.html> (9, Emad Victor Shenouda, 2006)

The tower linked to M1 (Fig 2b) is very characteristic: The colouring (yellow tip) is prominent and could be interpreted to indicate fire, which could lead to the identification of ‘Pharos’, the Alexandrian Lighthouse. Comparison with drawings of Pharos based on either literary sources or based on calculations (a recent paper summarises the history, 9) indicate further similarities with the tower linked to M1 in f86r: The number of stages and the ratio between these are further indices of a representation of Alexandria’s Pharos. Even the base on which it stands (Fig 2b, f86v) could be marked as an indicator of outstanding similarity of what was known at the time of the Pharos (Fig 2d, 2e). With the lighthouse being present in other *mappae mundi* representing Alexandria as metropolis of the ancient time, the similarities are convincing.

We suggest Alexandria to be linked to M1 (Africa) while Milan is linked to Europe (M2). Therefore the geographic third city landmark on the outskirts of M2 (Europe) could represent Constantinople, another main city landmark present in *mappae mundi*. Constantinople is often represented by a three tower structure. This leaves the question if the number three is intentional. Based on knowledge in the 15th century, Constantinople was well known as city of triangular shape, mainly

due to its location on the Golden Horn which was favourable for its defences. It might simply just be a copy effect of what the mapmaker saw on other maps, because Constantinople is often displayed as three-turret castle in *mappa mundi*.

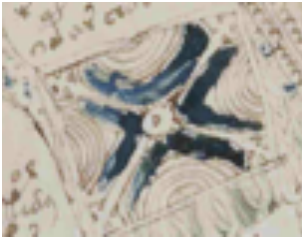
Interestingly both city landmarks, Alexandria and Constantinople are built next to or on an isthmus, indicated by their close location to their respective discs M1 and M2. Both were the biggest and most important cosmopolitan cities at the time, both were funded by arguably the most important emperors and conquerors of their respective time, both were exceptionally learned and knowledgeable emperors, who also founded these cities and gave their name to the cities and endowed their cities with the vision to become established centres of knowledge at the time.

Pinpointing the three major landmarks (Milan/Northern Italy, Alexandria and Constantinople) on the f86v starts to unravel a picture of elements of a medieval *mappa mundi* across the entire Rosette Map. Assuming the corner discs display continents with M1 representing Africa (linked to Pharos, Alexandria) and M2 representing Europe (Northern Italian Style castle and Constantinople on Europe's border (facing towards M3), the hypothesis for M3 to display Asia can be drawn. M3 does not display any visual indicators of a city landmark. The question arises if other prominent features of medieval *mappa mundi* reveal the identity of M3 in the Rosette Map.

The location of earthly Paradise in Asia

Paradise (Garden Eden) is frequently depicted in *mappae mundi* although the exact geographic location and physical quality of the earthly paradise/Garden Eden was much speculated on since early days of the Christian faith. Paradise was displayed in maps correspondingly; with no exact location, somewhere 'in the East' (since antiquity and Alexander the Great there was the equivalent of the later Christian Paradise, which was often depicted as an enclosed garden behind a wall - still visible in *mappae mundi* of the Medieval Ages (e.g. St Sever map (Beatus type), 1060).

Although the exact geographic localisation was not known, it was generally acknowledged that Paradise was located in Asia. M3 in f86v reveals in a visual comparison a landmark in the centre of the third disc (M3 in Figure 2c) that shows remarkable resemblance to the depiction of paradise in the Osma map.



3a



3b

Figure 3: Depiction of Earthly Paradise

Details of 3a) Rosette Map (disc M3, f86v), 3b) Paradise in the 'Osma' Map (Beatus world map, Osma copy(11), 1203, (from Miller, 7, image from <http://www.henry-davis.com/MAPS/EMwebpages/207H.html>)

Often paradise was idealized: A number of maps show the Garden Eden with Adam and Eve and with walls, (e.g. St Sever map,10) while others omit details: The 'Osma' branch of Beatus maps (12th-14th century) limits the visualization to a garden without mountains, walls, fire, Adam and Eve. The paradise is represented as source of the four rivers which have their origin in the paradise (11). This geometrically abstract feature in f86v is an exact match to one of the remaining Beatus maps (Fig 3a,b).

Strange that it seems, this sort of imaginary depiction of paradise is not uncommon and features frequently in *mappae mundi*. In fact, this idealization is particularly known in *mappae mundi* and one of their characteristic features. A. Scafi (12) points out that this sort of depiction of Paradise only appears in medieval maps and was lost with the advent of printed maps and portolan maps in the 15th/16th Century. This is a logical consequence of the increased geographic knowledge of oceans and far lands (to the West and far East) due to expanded travels and voyages. None of these endeavours actually revealed the existence and exact physical location of the Garden Eden. This took away the foundation for the placing of paradise in 'real' maps (portolan maps and globes to come), especially after the rediscovery of Ptolemy's geometry. However, the believe in the existence of a Garden Eden was not afflicted by this fact. What therefore happened was obvious: the depiction of paradise was completely eradicated and put into the realm of imagination. The transition from the depiction of paradise as an essential part of medieval *mappae mundi* to a decentralized position in late Renaissance maps is best visible in the artistic Fra Mauro map where Paradise is an appendix and engulfed by the ocean and located in the East (12, 13).

Although the believe in a physical existence of paradise in the habitable world vanished, the idea of an abstract representation still remained or had an even stronger influence on everyday's spiritual

life. The depiction of Paradise, as seen in *mappae mundi* of the 15th century (including the one postulated here) also inspired architecture e.g. layouts of gardens and cloisters in the Renaissance. Not surprisingly, this feature of the Rosette Map was postulated to be an Italian Renaissance garden (14) with f86v to be a map of Italy. This can be seen as a consequence but not a cause of the image of Paradise in the Rosette Map.

The forth continent

M1-M3 discussed above form the corners of a square which is completed by a fourth disc at the bottom left corner (M4, Figure 1). This has no obvious single visual characteristic or identifiable features apart from inelible words or text and water or wave like structures. A potential extension of Asia, as in proportional representation of Asia twice the size in TO maps, does not seem likely due to the independent status as disc. It is suggested that this disc represents a fourth continent. The existence of a forth continent is consistent with knowledge from late antiquity. A visual comparison with other *mappae mundi* shows the existence of a forth continent as described by several written accounts by Greek philosophers (15) (Fig 4, Beatus maps, Osma by Miller). However the visualization of this forth continent is hardly recognizable as equal to the other continents in the *oikumene*, the habitable world. This is not surprising as nothing was known about the forth continent and physical barriers existed that prevented access to this continent. Macrobius in his commentary on Cicero's '*Dream of Scipio*', which was very widely known during the medieval ages and preserved in many manuscripts, also contains a concept of the earth consisting of four habitable quadrants (16, p.70), although many doubted the existence of such a continent due to physical (natural philosophy) and theological reasons (18) and e.g. Strabo himself doubted a forth continent (17).



4a



4b

Figure 4: mappae mundi with depiction of a forth continent

Fig 4a Beatus world map Osma copy (1203, <http://www.henry-davis.com/MAPS/EMwebpages/207H.html>)

Fig 4b Interpretive redrawing of the St. Sever Beatus map (from General Cartography,p.14, by Erwin Raisz, 1938, <http://www.henry-davis.com/MAPS/EMwebpages/207D.html>)

Due to lack of further geographic knowledge the exact position was unknown in late antiquity and the medieval ages, which led to discussions whether it existed at all and whether it was inhabited or not. Usually the so-called Antipodes were characterized as uninhabitable although various travel writings at the time reported of life (or life forms) occupying this far and distant continent (e.g. Travels of Sir John de Mandeville, Sciapods). These occasionally found their way into maps (see Fig. 4a). In contrast to the simple depiction of the Antipodes in the Beatus maps, the forth disc M4 in folio f86v reveals no fully circled disk like Africa, Asia and Europe representing the habitable *oikumene*. It lacks the geometry of the completed discs of Europe (with mountains, lakes, fields), Africa and Asia (including Paradise) and gives the viewer the impression of being an unfinished continent and still open sphere with a central nucleus or core. An unfinished state could be the map maker’s intention due to the aforementioned completely unknown status of this part of the world (to be commented on later). Furthermore, the artist might reflect in this image the details of the description of a written account of the Antipodes by Isidore quoting Macrobius (17) on the existence of the Antipodes and theories by other prominent classical, post-classic and medieval natural philosophers on how the *terra orbis* came into existence. Especially compelling is the quote by Olympiodor commenting on Aristotle who describes the creation of the circular spheres “by mixing the classical elements water and air, and how the intrusion of water forms ‘bubbles’ “(18). The visual depiction in the Rosette map (Fig 5b) certainly hints at the possibility of water bubbles (blue colour, waves).

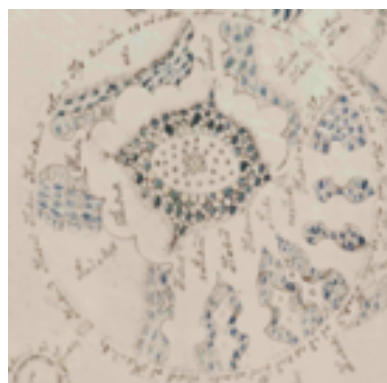
The centre of the Rosette Map: Heavenly Jerusalem

Jerusalem as the religious centre of the Christian world often is essential part of a *mappa mundi* and, from late antiquity onwards, frequently occupies the centre of the map (example: Hereford *Mappa mundi* or the London Psalter, British Library, Additional Ms 28681, fol.9r, 19). After the Christians' final loss of Jerusalem during the Crusades (1244) the spiritual centre of Christendom increasingly evolved to a state of a New, Heavenly Jerusalem (19, 20). After 1244 Jerusalem was put less in the centre of maps - only into written accounts (20). Subsequently, Jerusalem was often exchanged for a new, heavenly and virtual *imago* of the centre of the Christian theological world.

The central disc in f86v has features similar to those in other *mappae mundi* displaying the virtual centre of Christendom: (circular shape of the city walls, inner city streets, here the links to several examples (13th century: http://www.bibliotecapleyades.net/mapas_antiguos/em_webpage/205EE.htm , 12th century: http://www.bibliotecapleyades.net/mapas_antiguos/em_webpage/205FF.htm, 13th century: http://www.bibliotecapleyades.net/mapas_antiguos/em_webpage/205GG.htm). It is elevated from the actual earthly existence into a separate central *rota* around which the whole folio rotates. Another depiction of Heavenly Jerusalem has been compared to a cog wheel central to the revolving universe/world by Evelyn Edson (22, p.140) which would also be a suitable description of the depiction of the central disc in this folio around which the world circulates. Apart from its shape and form, more details are obvious: Around its circumference 12 pipe systems are located, which could symbolize the number of 12 gates of Jerusalem (Revelation 21) or hypothetically any other 12-some ratios in relation to the centre of Christendom (e.g. 12 apostles, 12 tribes of Israel or 12 churches (23). Being a perfect number, it furthermore strengthens the deliberate use and systematic approach of the map maker.



5a



5b



5c

Figure 5 Further Landmarks

5a) Central disc displaying the Heavenly Jerusalem, 5b) M4, the fourth continent in the making by mixing the elements; and 5c) M1, Africa with the branches of the river Nile

So far, by comparing the Rosette map to other medieval *mappae mundi*, we have shown that major city landmarks and the four continents are present in f86v of the Voynich manuscript. In the following we will present further evidence to strengthen the existence of continents and further elements present in a *mappa mundi* in the Rosette map.

Further evidence and more landmarks in the Rosette Map

The characteristics presented so far are interesting, although far from compelling. Nevertheless a picture starts to emerge of a map constructed by a medieval mind. Still, there are plenty of other, unusual and unexpected, characteristics in the Rosette Map, which in present form, haven't been identified in any other *mappa mundi* yet.

One of the most intriguing, unusual and prominent details of the Rosette Map is the pipe system protruding from disc M1 (Figure 1) which is proposed to constitute the African continent. It is the single biggest features in or at the 'African' disc which is closely located to the *Pharos* landmark (see Fig 5c)

The pipe system consists of five pipe stems protruding out of the disc. A random number of five is highly unlikely due to the importance of details and usual level of sophistication in the map making process. What may have led the cartographer to use five? An explanation for this remarkable feature is a potential reference in 'The Histories' by Herodotus, a well known source of antiquity and known in the medieval ages, and this feature in f86v may represent a qualitative (use of pipes) and quantitative (number of five) hint at the River Nile. This *opus* was well known since classical times and its author, Herodotus of Halicarnassus, has been named 'father of History' and first topographer. In book II of 'The Histories' (24) he refers to the Nile delta and its five branches (or mouths as he calls these):

Book II, 10:

...In all these regions the land has been formed by rivers, whereof the greatest is not to compare for size with any one of the five mouths of the Nile...

Could the mapmaker possibly have used the 5 stem pipe system to represent the Nile Delta and its 5 branches according to historic sources? In the imagination of antiquity the Nile drained the whole continent (24) since beginning of time and the use of the pipe stems piercing the African continental disc is a very suitable visual depiction.

Further examining the River Nile in the map, the diagonal positioning in a 45 degree angle is another visible feature of the Rosette map. If the pipe system is extended towards both corners of the folio, the diagonal of the entire map is matched at both corners of the map by two small suns (the diagonal, drawn between the two suns symbolising the equator). The cartographer might have hidden another feature in reference to the River Nile's equatorial position as postulated (wrongly) by Anaxagoras and commented by Herodotus, that the river Nile was described to run parallel to the equator with respect to its geographic location (Herodotus book II, 32-35).

A few other *mappae mundi* actually make use of the equatorial hypothesis of the course of the Nile. If we take a look again at the 'Osma' map for example (which was introduced earlier in Fig 4) and follow the course of the River Nile, we see that it exactly matches the description of Herodotus in book V (Caveat: different orientation of the Osma map, East is top).

The matching comparison of this particular feature of the Rosette Map with both, the comments in literature (Herodotus) and the imagery of a contemporary map (Osma map) provides a sufficient explanation and leads to a robust conclusion on the identification and positioning of the River Nile in the Rosette Map.

This paper is not concerned with the deciphering of the Voynich text. However, next to the pipe system is a sequence of text. Using an approach by Feely (25) who worked on a different part of the manuscript and believed in the Voynich manuscript using medieval Latin abbreviations, the text would read : 'OT ST OM' : Using Adriano Cappelli's book on medieval Latin abbreviations of the 15th century (26, http://inkunabeln.ub.uni-koeln.de/vdibProduction/handapparat/nachs_w/cappelli/cappelli.html) it could read *otium est omnium* translating to '<this/here> is the mouth of all' consistent with the positioning of the mouths/branches of the Nile delta.

So far, image details and comparisons with other *mappae mundi* lead to the proposed identification of the four continents based on landmarks and characteristic features. However, the question remains why the mapmaker choose the depiction of four discs and not a single disc shape (circular or oval as many other *mappa mundi* cartographers did). There is no other map to the author's knowledge that uses four equal sized discs to represent the *oikumene* and the antipodes. However, antiquity knows of a representation of the four continents in four regular, equally sized 'junks' already: The *orbis quadratus* ascribed to Krates of Mallos quoted by the geographer Strabo (27, p269, Fig 1). Caveat here is the fact that according to Krates the habitable world is depicted in one quarter only (equivalent to M2 'Europe'; not in three continents as seen in the Rosette map. The

geometry looks similar to the *orbis quadratus*, even the orientation is identical. Again, this is another indicator that the cartographer was familiar with classical sources like Herodot, Strabo and others known at the time.

So far the visual analysis concentrated on the four discs in the corners (M1 - M4) and the centre of f86v. A supposed reason for the display of the four corners of the world in the present form might be the aforementioned classical source(s) or their derived medieval philosophy of harmonious equilibrium. The possibility of a world map was mentioned in a blog post by Diane O'Donovan (28) by comparing f86v with Chinese square maps although no comparison with classical sources (e.g. aforementioned Krates) or further details on the identification of the individual continents or landmarks were provided for f86v.

Until now we haven't taken into account nearly half of f86v, notably the remaining four discs (Figure 1, E1 - E4). The conclusions of the analysis of the discs in-between the proposed continents M1 to M4 will also reflect and strengthen the layout of the Rosette map's cartography.

Feature	Rosette Map (folio86v)	Osma	Beatus (St Sever)	Fra Mauro
date	15th century (1408-1434)	1203	1060	ca. 1450
Heavenly Jerusalem	yes (centre)			
Major Cities	Alexandria, Constantinople	Jerusalem (centre)	Jerusalem, Rome, Constantinople (Byzantium)	Jerusalem (latitude: centre, longitude: shifted to west)
River Nile	yes	yes	yes	yes
paradise (details)	4 rivers (symbolic)	4 rivers (symbolic)	walls, Adam and Eve, snake	4 rivers, Adam and Eve, walls
paradise (location in map)	integral	integral	integral	appendix
antipodes	yes	yes mono/unipodes	yes	no
shape	separate discs	oval	oval	circular
other characteristic features	-	apostles, uni	islands	4 appendices
orientation (top)	West	East	East	south
Elements	yes	-	-	yes (appendix)
Winds	?	no	no	no
Cardinal points	yes	no	no	probable (sol oriens)

Table 1: Comparison of characteristic features of mappa mundi including f86v

Folio86v (Rosette map) is compared with contemporary late medieval and early Renaissance *mappa mundi*

The four remaining discs -The Four Elements

The image of the four continents as discs with Jerusalem in the centre are completed in this unique representation by four additional circular shapes in-between (E1 - E4, see Figure 1). These rota-like spheres are all linked and connected to the central disc.

A visual inspection reveals no feature in E1 to E4 that hint at any known cartographic detail e.g. city landmark or any other details as described above to postulate a geographic characteristic. Differences in style (predominantly colour and form) lead to the suggestion that each of these discs features a different meaning. It is suggested that these shapes indicate the four classical elements earth (E1), water (E3), air (E4) and fire (E2) to the map according to Figure 6.

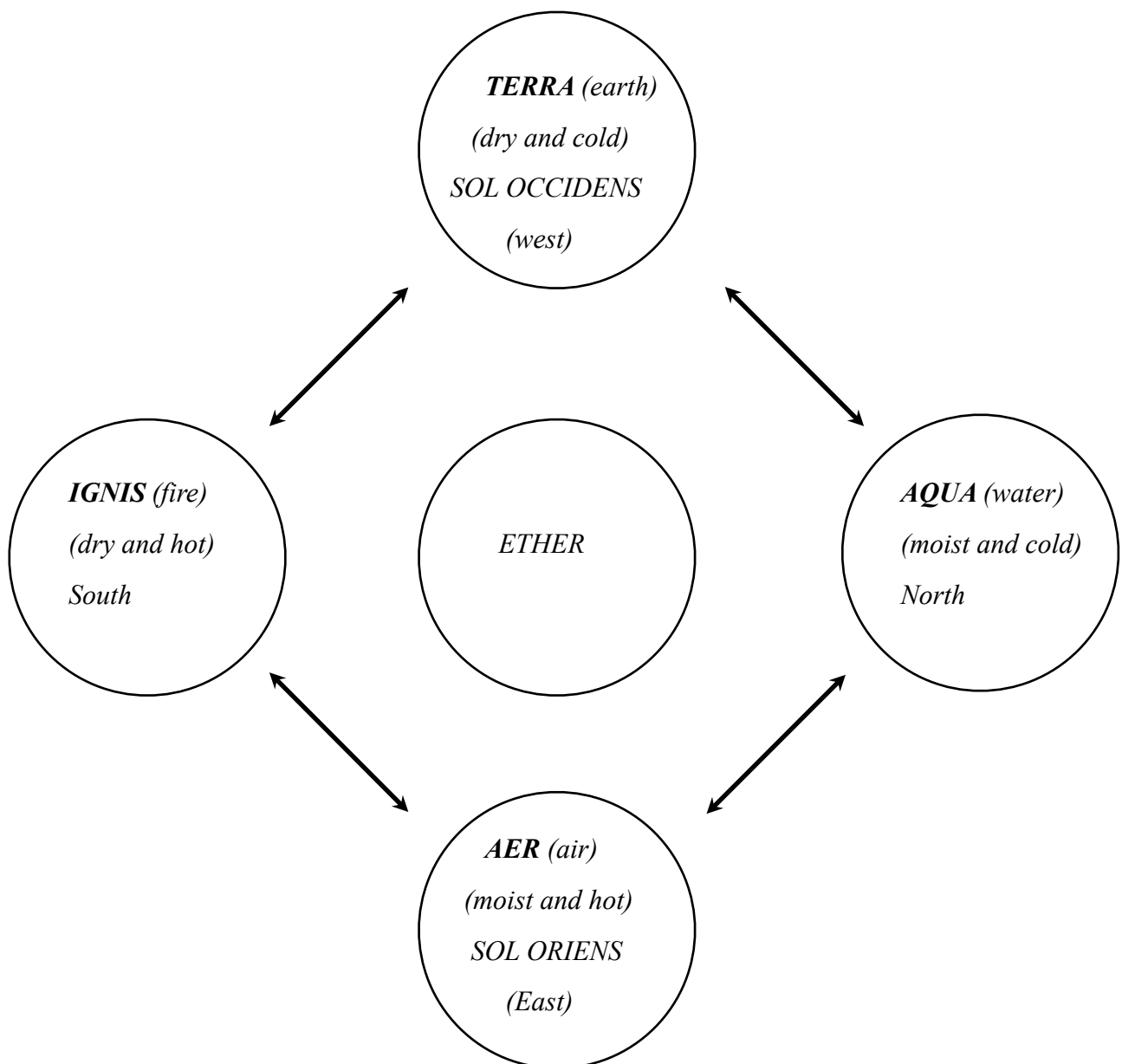


Fig 6: Summary of the classical Elements and their qualities in f86v

According to Aristotle, the four (classical) Elements are complemented by ether (29). Ether as ‘quintessence’ is the pure, universal Element. Aristotle (and Plato, as shown in the *Timaeus*) consider ether as crucial to the structural scaffold of the universe (29): The equally sized discs E1 to E4 are fixed to the Centre, which leads to the conclusion that the centre of the map is the centre of the cosmos.

The four Elements air, water, earth and fire, which are all sub lunar according to Aristotle’s physics in ‘*On the Heavens*’ (book I, 2-3), are all derived by an elevated ether and have only limited qualities and properties. The four Elements can mix and interact with each other resulting in different properties derived by the mixture of the contributing Elements (Plato, *Timaeus* 49b-51c <http://www.mlahanas.de/Greeks/PlatoSolid.htm>). In contrast, pure ether is unchangeable and superiour to the other Elements. Aristotle and later sources, for example Isidore of Seville in his *Ethymologiae* (Book IV and XI), provide ample examples for the type of qualities of the Elements (30).

Postulating the four Elements in the Rosette Map, we can deduce the climate between the four Elements (as well know from various diagrams, 30) for each of the intersections with the neighbouring element: For example, a dry climate can be postulated for the area (disc M1) between *terra* (E1) and *ignis* (E2). Disc M1 was identified as Africa with the *Pharos* and the Nile and the climate corresponds; Europe between *terra* (E1) and *aqua* (E3) as habitable 'world' is blessed with a predominately cold climate (cold as consequence of *terra* and *aqua* according to Aristotle). Even the Antipode continent falls into place with the anticipated hot climate according to the Elements diagram: Bede in ‘*De temporum ratione*’ (chapter 34: *De quinque circulis mundi et subterraneo siderum meatu*) and others e.g. Pliny quote the climate in the forth continent to be hot (17, chapter 3a, p. 95).

Climate diagrams with a visual display of the mixed states exist that also contain explanatory text with respect to the interstates of the Elements. An excellent example is provided in a *computus* manuscript MS17 fol.39v (St John’s College, Oxford, 31) or Pythagorean tetrads (Fig 7)

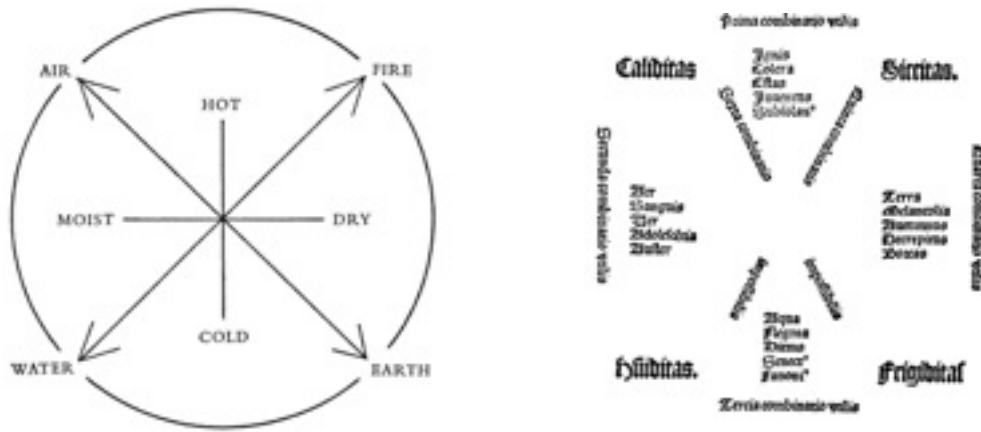


Figure 7 Pythagorean Tetrads, from Heninger, S.J. (37)

Further and final confirmation of the continents is provided using another characteristic feature of the Elements according to the Greek Aristotelian tradition which was perceived in the Middle Ages by the writings of Isidore of Seville (*Ethymologiae*): The Elements are also linked to the cardinal directions (compare Element summary in Figure 6, and map overlay Figure 8a): Applying the cardinal direction via the Elements to the Rosette map, we can conclude that the map is oriented with west at the top of f86v confirming again the topographical location of Africa, Europe, Asia and the Antipodes (NB: compare the geographical location of the Antipodes in Beatus and other maps; also located to the South-East).

The integral visual display of the four Elements in a *mappa mundi* in the early renaissance is a new and so far unknown concept. Neither map or manuscript (of the Beatus or Macrobius style) exhibit such a synthesis of these two pillars of medieval knowledge. This unique combination might be one of the reasons this folio escaped identification. Examples exist where the four classical Elements are annexed to a *mappa mundi* but are not an integral part of the map: For example, in Fra Mauro's artistically and beautifully executed map the Elements are displayed in form of concentric circles in an appendix (32, again four appendices to the main corpus as indicator of equilibrium).

Another lead from the visual inspection of the Rosette Map is provided by the cartographer's colourcode: *Ignis* and *Aqua* can be labeled with the appropriate colour use for elements (30) of yellow and blue, respectively. *Terra*, could be linked to the colour black as its characteristic feature, whereas *Aer* certainly has an airy/empty 'white' feel to its construction (E4, Fig.1) with the biggest empty spaces in the artistic execution around the disc in comparison to the other elements. Whereas

the colour code for both *Terra* and *Aer* might not be compelling, further proof can be derived from their respective cardinal direction in the Rosette Map by a comparison of these two elements in f86v with another excellent example of a an Element display in the *Liber floridus*: The display of East (element *Aer* at the bottom in the Rosette map) and West (*Terra* on top) show distinctive windrose-like features with distinguishable numbers of ‘spikes’: The exact same image display for these cardinal directions has been used in the *Liber floridus* - with a inscription of *sol oriens* (East) and *sol occidentis* (West) respectively (33).

Alternative interpretations

An alternate or different interpretation for the four intermittent discs E1 to E4 other than the classical Elements and their corresponding characteristics such as climate and cardinal points seems highly unlikely. Both the deduced climate and cardinal points described in this paper robustly link E1 to E4 to the continental discs M1 to M4 and their correct geographical location. Other ‘four-somes’ (four as a measure of harmonious equilibrium in the medieval world was very common, e.g. humours or body fluids) don’t seem to feature in the Rosette map. Extensive searches for medieval manuscripts with imagery were carried out to no avail of matching these to the Rosette Map.

A combination of *mappa mundi* with wind or climate zones are not unknown. In this paper we will not comment on Macrobius maps representing climate zones. The display of winds, as it features in other medieval maps, seems to be missing in f86v (usually the wind is depicted at the border of the map (e.g. Lambert of Saint-Omer *Liber floridus*, MS92, fol.24r, fig. 13) (34) . No visually identifiable feature in the Rosette map could be matched to the display of (up to) 12 winds, that were known in the medieval world. Although it can’t be excluded that the winds feature somewhere in the Rosette Map (e.g. 12 pipes in the central disc).

SYNTHESIS: Elements of a *Mappa mundi* and a map of the Elements

The four continents, the four Elements (with their associated characteristic climate and cardinal directions) and the central combination of Heavenly Jerusalem and the pure universal Element ether form a unique display and robust combination of the model of the universe (*cosmos*) as known in the medieval ages. The question remains if it can be classified as *mappa mundi*. It certainly does not include lists of town and river names (compare with the Hereford or Ebstorf map, which size and

purpose are on a different scale). A sufficient number of *mappae mundi* exist without explicit display of cities or landmarks. Most importantly, contemporary map knowledge is reflected in the MS 408 Rosette map in extraordinary detail. Many details are featured, and a direct comparison with the Osma map may lead to the assumption that the map maker of VM408 f86v was aware of a type of map within this branch of *mappae mundi* (classified after Miller, 1895) due to a significant overlap of characteristics and features as described in this paper.

The Rosette map's purpose is not to serve as a *mappa mundi only*. The cartographer succeeds in reviewing and combining their knowledge in a truly magnificent and intellectual manner. It seems not unlikely that the map maker was aware of a copy of the *Liber floridus*, a bestiary medieval encyclopedia. In comparison to the Fra Mauro Map (32), which excels in artistic expression, f86v might not be deemed of the highest artistic standard, however, the Rosette Map as part of the Voynich Manuscript might have been part of a teaching manual or encyclopedia, combining current knowledge on botany, astronomy and cartography. For the medieval spectator this folio would have presented a geo- and cosmographic, christo-theosophic map of the world, a model of the medieval Universe based on the intellect of antiquity brought forward to contemporary medieval knowledge in cartography and cosmography, highlighting the neo-platonic emergence of ancient knowledge on natural philosophy.

Model of the Universe

In this paper we have shown the first full scale comparative analysis and comprehensive review of all aspects of MS 408 f86v ('Rosette Map') with an identification of

- 1) common elements of a *mappa mundi* and
- 2) the classical Elements and
- 3) the interaction of both via climate and cardinal points.

The way the map maker envisaged and expressed their view of the universe was achieved in a very unique visual style (independent of the knowledge of the text). This unique and so far unknown way of integrating and combining elements makes the Rosette Map very different from existing maps. This is not surprising: Cartographers used different shapes and components in medieval *mappae mundi* revealing a unique style to express levels of individual knowledge and style and the importance of detail (of images) to medieval map makers. The creator of f86v obviously combines much more contemporary information into this one folio. Its execution is systematic and deliberate

in style and geometry, it is reminiscent of the description of the medieval mind and model by CS Lewis in his book 'The discarded image' (36):

“The medieval model, for all its scientific misunderstanding, is detailed, complex, and beautiful. This is the medieval synthesis itself... the whole organisation of their theology, science, and history into a single, complex, harmonious mental Model of the Universe. The building of this Model is conditioned by two factors...the essential bookish character of their culture, and their intense love of system.”

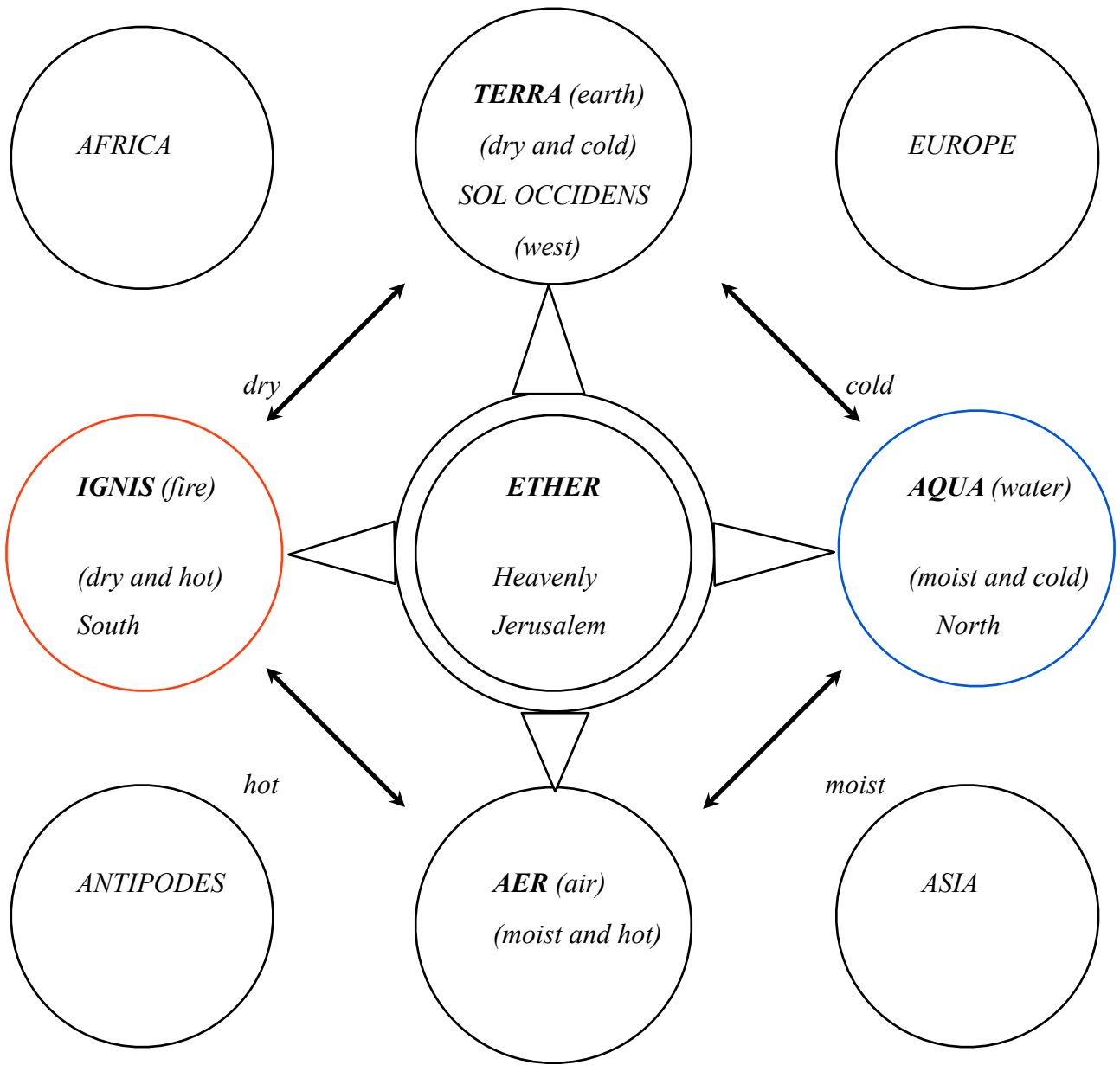
The discs are by no means an expression of a flat earth. The medieval mind knew better. Often 'modern' eyes like to identify a falsely attributed medieval point of view due to the perceived artistic incompetence or unavailability of displaying three-dimensional effects at the time. The four discs representing the continents might be more of a reflection or description or *pars-pro-toto* of the predominate climate in the respective 'part of the world'. Europe is displayed with fields, castle, towers etc in reminiscence of other medieval depictions (Example of fields and ploughing, 35) and it is not intended to display a flat earth model.

The four Elements and the four parts of the world in f86v are a unique representation of the medieval universe. Minding the equilibrium with visually very pleasing 'four-somes'- geometry and symmetry, the map maker possibly intended a 'squaring the circle' in f86v displaying a square with a central Heavenly Jerusalem as both, the quintessential (*sic!*) geometric and spiritual centre of the universe and, simultaneously, as the Aristotelian fifth element, the so-called quintessence (often referred to as ether) of the known *cosmos* suitable for the new, heavenly centre of the spiritual medieval world depicted in the Rosette Map in VM408 Folio 86v.



Figure 8a : Summary of visually identifiable components of f86v (overlay)

SOL OCCIDENS (West)



SOL ORIENS (East)

Figure 8b : Summary sketch of visually identifiable components of f86v

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