Diagram and Dimension:
Visualising Time in the Drawings of Opicinus de Canistris (1296-c. 1352)



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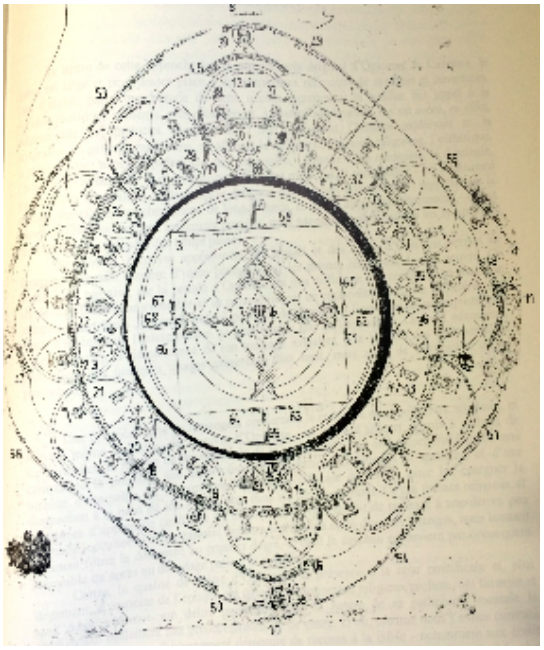
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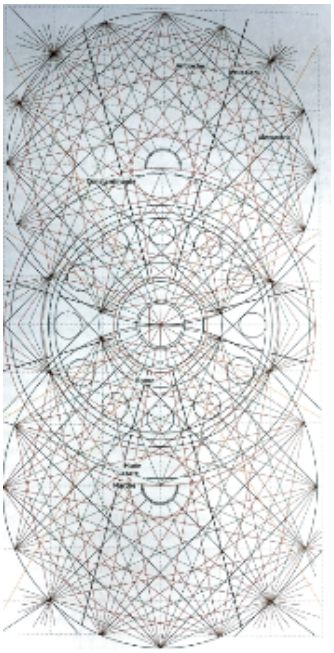
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Appendix I: Digital Annotations of *Palatinus A*

Diagrams of Diagrams

The many detailed layers in each of Opicinus's drawings make their description a challenge. This is reflected in the various attempts made by Opicinus's interpreters to present clear illustrations of the Palatinus which provide transcriptions and translations of the text, whilst showing how the text relates to the different structures contained in each drawing. Salomon often presented his transcriptions and translations of the Palatinus text in tables, but these could not reflect how the text related to the visual features of the diagram. Scholars since, who have recognised the necessity for showing how the text and image interrelate, have made illustrations which are founded upon simplified outlines of the drawings. Roux and Laharie, for example, presented outlines of the diagrams with numbers positioned over their text and figures (detail 1), and provided a legend by the side of the image which contained translations of the text and identifications of the figures. A similar type of illustration is used in this thesis (such as fig. 47a) for situations in which particular details of the diagrams are being discussed. Piron also made simplified outlines of the diagrams (detail 2) to emphasise certain features of the maps and show how they are situated within the diagram as a whole.





Detail 1 (left): Diagram of Palatinus, fol. 1^{r} from Roux and Laharie, *Art et folie*, p.337

Detail 2 (right): Diagram of Palatinus, fol. 5^{r} from Piron and Nuss, *Dialectique du monstre*, p.147.

Although these are helpful, the illustrations of Opicinus's drawings made thus far have not satisfactorily conveyed how the different layers of each drawing interrelate. To observe the different features within the Palatinus drawings (such as the maps and calendars), the viewer is required to separate the different layers which are placed on top of one another and are often interweaving. For this reason, this thesis presents a digital annotation of *Palatinus A*. The user can interact with the drawing by highlighting certain features, and thus observe how certain overlapping layers can be distinguished from one another, without compromising the legibility of the drawing's details and text. The digital annotation offers a way for the viewer to engage with the explanatory annotations of the drawing while still interacting with the primary source, rather than with a simplified diagram of the drawing.

Appendix 1 includes:
1. Instructions on how to access and use the digital annotations.
2. A transcription of the dial system of the movable calendar of *Palatinus A*, which has its own digital annotation and is the main subject of chapter three.

1. Accessing the Image Annotations

The VGG Image Annotator (VIA) was developed by the Visual Geometry Group in the Department of Engineering Science at the University of Oxford. I am grateful to Giles Bergel, for introducing me to the project, and to Abhishek Dutta, who showed me how to use the VIA and has responded to my queries and suggestions for improving the annotator. For more on the project, see: http://www.robots.ox.ac.uk/~vgg/software/via/

The following contains instructions on how to view the annotations:

1. Access the VIA tool online by opening the following link in your browser: http://www.robots.ox.ac.uk/~vgg/software/via/via.html

2. Click 'Image' on the bar running across the top of the screen, and from the drop menu select 'Load or Add Images'

3. From the files on the accompanying USB stick, select ‘fol.14r.PNG’ for the annotations of the entire image, and ‘14r.temporale.PNG’ for the annotations of the movable calendar. The picture should then appear in the annotator. Note that the annotations will not work if the file name of the image is changed.

4. To upload the annotations, select 'Annotation' in the bar at the top of the screen, click 'import' from the drop-down menu, and select the appropriate .CSV file.

There are different iterations of annotations which can be uploaded to the image:

For the image: ‘fol.14r.PNG’, the following annotations are available:
a/ ‘Annotations_14r’ has been tailored for the clarity of this thesis.
b/ ‘Annotations_14r_full’ contains all of the annotated information and includes more of the text of *Palatinus A*. Much of this content is not, however, treated in this thesis.

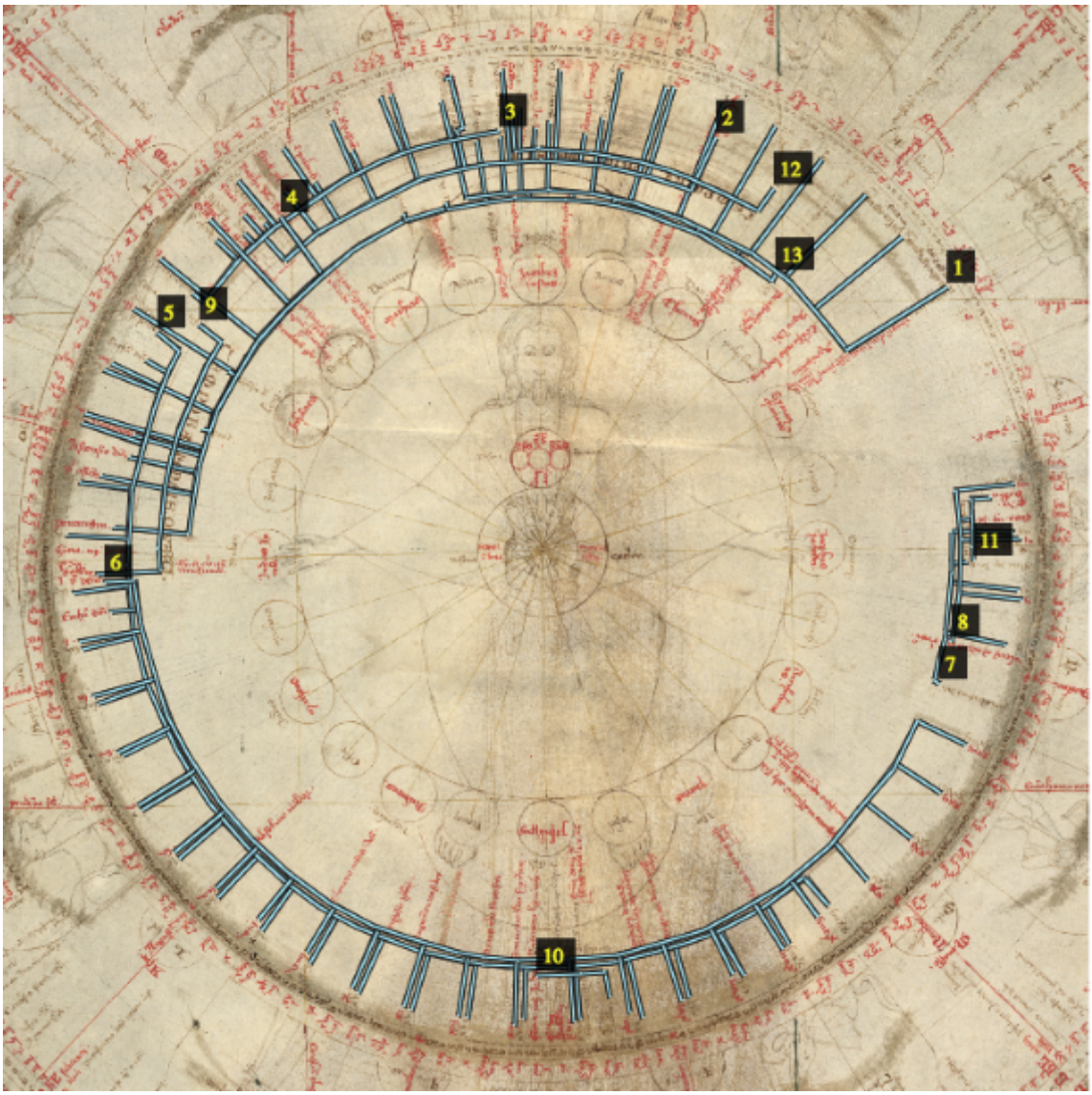
For the image: ‘14r.temporale.PNG’, which focuses on the movable calendar of the drawing, the following annotation is available:
c/ ‘Annotations_14r_temporale’ contains the annotations which explain the system of dials Opicinus used in his movable calendar. These will only appear if you have selected the image ‘14r.temporale.PNG’.

The regions should now be highlighted blue, and each labelled by yellow numbers on a black square.

In order to see a description of each region, click ‘Region Attributes’ in the bar to the left of the image. A table should appear below, containing a visual description/a transcription of the text of that region, followed by its identification.

Tips for viewing:
- If you click on a number in the ‘region attributes’ table, the region it describes will be highlighted in the image above.
- In order to view the highlighted sections without their numbers, or vice-versa, go to ‘View’ in the bar running across the top of the page, which provides different viewing options.
- To zoom in and out of the image, use the ‘+’ and ‘-’ symbols in the bar at the top of the page.

2. The Calendar Dials of *Palatinus A*



Annotations of the movable calendar (*Palatinus A*) dials in VIA

The numbers of the dials below correlate to the labels in the digital annotation of the movable calendar.

Pre-Lenten and Lent Season

1	18-Jan	prima lxx	**2**	21-Feb	ultima lxx
	25-Jan	lx		28-Feb	lx
	01-Feb	l		07-Mar	l
	04-Feb	Feria iiij cinerum		10-Mar	Feria iiij cinerum
	08-Feb	xl		14-Mar	xl
	11-Feb	Feria iiij Je[junia] I		17-Mar	Feria iiij Je[junia] I
	15-Feb	ij		21-Mar	ij
	22-Feb	iij		28-Mar	iij
	01-Mar	iiij		04-Apr	iiij
	08-Mar	v de passione		11-Apr	v de passione
	15-Mar	vi in palmis		18-Apr	vi in palmis
	19-Mar	Finis xl F[eria] v F vj		22-Apr	Finis xl F[eria] v
	25-Mar	Finis lx F[eria] iiij		28-Apr	Finis lx F[eria] iiij
	28-Mar	Finis lxx Sabbatum		01-May	Finis lxx Sabbatum

Easter

3	22-Mar	Pascha domini finis	**4**	25-Apr	Pascha domini finis
	29-Mar	Octavia		02-May	Octavia
	05-Apr	ij		08-May	ij
	12-Apr	iij		16-May	iij
	19-Apr	iiij		23-May	iiij
	26-Apr	v		30-May	v
	27-Apr	Rogationes		31-May	Rogationes
	30-Apr	Ascensio domini		03-Jun	Ascensio domini
	03-May	post ascensionem		06-Jun	post ascensionem
	09-May	pentecostes		13-Jun	pentecostes

Sundays after Pentecost

5	16-May	I post pentecostes	**6**	20-Jun	I post pentecostes
	20-May	Eucharistia domini		24-Jun	Eucharistia domini
	23-May	ij		27-Jun	ij
	30-May	iij		04-Jul	iij
	07-Jun	iiij		11-Jul	iiij
	14-Jun	v		18-Jul	v
	21-Jun	vj		25-Jul	vj
	28-Jun	vij		01-Aug	vij
	05-Jul	viij		08-Aug	viij
	12-Jul	viiij		15-Aug	viiij
	19-Jul	x		22-Aug	x
	26-Jul	xj		29-Aug	xj
	02-Aug	xij		05-Sep	xij
	09-Aug	xiij		12-Sep	xiij
	16-Aug	xiiij		19-Sep	xiiij
	23-Aug	xv		26-Sep	xv
	30-Aug	xvj		03-Oct	xvj
	06-Sep	xvij		10-Oct	xvij
	13-Sep	xviij		17-Oct	xviij
	20-Sep	xviiij		23-Oct	xviiij
	27-Sep	xx		31-Oct	xx
	04-Oct	xxj		07-Nov	xxj
	11-Oct	xxij		14-Nov	xxij
	18-Oct	xxiij		21-Nov	xxiij
	25-Oct	xxiiij			

Advent

7	27- Nov	prima adventus domini	**8**	03-Dec	ultimus adventus domini terminus
	04-Dec	ij		10-Dec	ij
	11-Dec	iij		17-Dec	iij
	14-Dec	Feria iiij Je[junia] x		20-Dec	Feria iiij Je[junia] x
	18-Dec	iiij		24-Dec	iiij

In some of the dial structures, Opicinus included the fasting days, such as Ash Wednesday (*Feria iiij cinerum*) in dials 1 and 2. Whether Opicinus intended to connect the fasting dates into the seasonal dials is unclear, as many of them overlap with multiple other feasts and dials.

Ember Days

The dial systems of the Ember days work slightly differently from the others. Although every date is written into the *temporale*, only two of the dates in each set are connected to the fork structure: the first day of the earliest parameter (*Feria iiii Ie*[*junia*] ...), and the last day of the latest parameter (*Sabbatum*). For example, the fork labelled 'tempora mensis quarti' (dial 9) connects 13 May and 19 June. This entire set is then labelled as the appropriate 'tempora mensis'. In this case, the first 't' and final 'a' (of 'tempora mensis quarta') align with 13 May and 19 June respectively. The dial therefore acts not to replicate the Ember days in order to map them onto one another, but to group the earliest and latest parameters together under one rung.

9	Tempora	13-May	Feria iiij Je[junia] iiij	16-Jun	Feria iiij Je[junia] iiij
	mensis	15-May	F[eria] vi.	18-Jun	F[eria] vi.
	quarti	16-May	Sabbatum	19-Jun	Sabbatum
10	Tempora	15-Sep	Feria iiij Je[junia] vij	21-Sep	Feria iiij Je[junia] vij
	mensis	17-Sep	F[eria] vj.	23-Sep	F[eria] vj.
	septimi	18-Sep	Sabbatum	24-Sep	Sabbatum

11	Tempora	14-Dec	Feria iiij Je[junia] x	20-Dec	Feria iiij Je[junia] x
	mensis	16-Dec	F[eria] vj.	22-Dec	F[eria] vj.
	decimi	17-Dec	Sabbatum	23-Dec	Sabbatum
12	Tempora	11-Feb	Feria iiij Je[junia] I	17-Mar	Feria Je[junia] I
	primi	13-Feb	F[eria] vj.	19-Mar	F[eria] vj.
	mensis	14-Feb	Sabbatum	20-Mar	Sabbatum

The Median Dial

Dial 13, the entries of which are found closer to the calendar's centre than the others, consists of a selection of the most important feast dates and Sundays from the Pre-Lenten and Easter seasons (dials 1 to 4). Each entry included in this dial is the median of the earliest and latest date on which the feast can lie. This is described in chapter three.

13	04-Feb	lxx
	11-Feb	lx
	18-Feb	l
	25-Feb	xl
	04-Mar	[illegible mark]
	11-Mar	iij
	18-Mar	iiij
	25-Mar	v de passione
	01-Apr	vi in palmis
	08-Apr	pascha domini
	15-May	ascensio dei
	27-May	pentecostes

Appendix II: The Manuscripts of the *De Rotis Ezechielis* (BN 12018 and BN 503)

This appendix looks at the diagrams of the two copies of Henricus de Carreto's *De Rotis Ezechielis* (BN 12018 and BN 503) and how they relate to one another. Following a justification of how BN 12018 can be used to reconstruct the original appearance of the diagrams of BN 503, table 1 compares the details of the Gospel animals in each manuscript, and tables 2 to 5 illustrate the diagram set in BN 12018.

A Reconstruction of BN 503

Only eight leaves separated from BN 503 are currently known to exist, but the following comparison between the earlier copy of the *De Rotis*, BN 12018, and extant leaves separated from BN 503 indicates that BN 503 included more diagrams identical to those in BN 12018, if not the entire set.[1] This means that it is possible to reconstruct the appearance of the lost leaves of BN 503 using BN 12018.

First, the known illuminations from BN 503 (including the half-page miniatures still in the codex: folios 80^{v}, 83^{r}, 85^{v} and 87^{r}) are almost identical to those of BN 12018 (compare figures 38 and 41), with only a few stylistic differences. Second, the traces of illumination in BN 503 which have been imprinted from the now-separated leaves show that at least one of the separated illuminations was identical to that in BN 12018. In detail 1a, pigment from a now-separated

[1] The author is aware of the current location of six of the leaves. Five are in the collection of Robert McCarthy and one owned by Jörn Günther Rare Books. This consists of different iterations of the vision of Ezekiel (such as fig. 41) and the Mysteries of Christ. My thanks to Bryan Keene, Assistant Curator in the Department of Manuscripts at the J. Paul Getty Museum, for this insight. One has been discovered by Stones in a private collection. Stones, *French Gothic Manuscripts, Part 2*, 1, p.149.

illumination in BN 503 has been transferred onto the verso of the preceding folio. The mirror image of the traces of transferred pigment, and therefore how the original image appeared, is almost identical to the left-side figure of fol. 260[r] in BN 12018 (detail 1b).





Detail 1a (left)*:* BN 503, fol. 164[v], (reversed detail).
Photo: S. Griffin, © Bibliothèque nationale de France

Detail 1b (right)*:* Detail from BN 12018, fol. 260[r] (fig. 40). Photo: S. Griffin, © Bibliothèque nationale de France

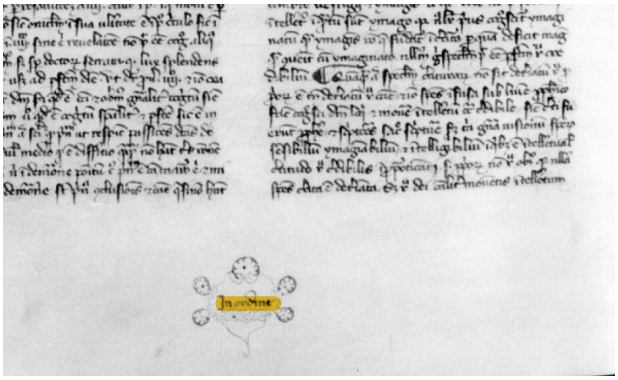
The reversed image shows half a circle with a figure seated inside. The blue corresponds to the blue robe of the seated figure in detail 1b, and the grey hair of the figure. The red background to the left of the figure in detail 1a, which is gold and green (labelled *crisoliti* on folios 115-118[v]) in detail 1b, shows the preparation ground (bol) for the gilding. Stones identified this missing leaf of BN 503 in a private collection, proving that it is indeed a copy of fol. 260[r].[2] This shows yet another diagram from BN 503 identical to one of those in BN 12018, and which was in the same place in the text of BN 503 as it still is in BN 12018.

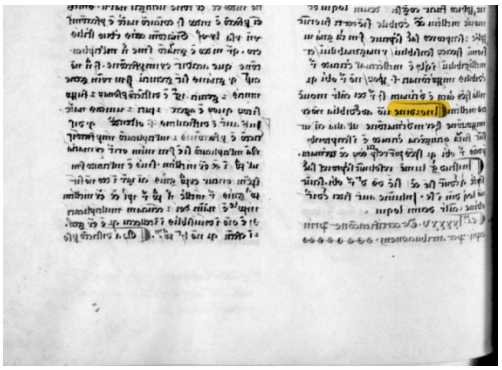
Third, an examination of the structure of the manuscripts indicates that the wheels-within-wheels diagrams were separated from BN 503 as a quire, along with the missing text and images of the vision. (Note that an interpretation of the collation of BN 503 is not helpful as it has been rebound since the images were extracted.) It is possible that the copyist chose not to copy every diagram found in BN 12018, but a comparison between the texts of the two copies suggests

[2] Stones, *French Gothic Manuscripts, Part 2*, 1, p.149.

otherwise. The *in ordine* written at the base of the leaf in BN 503 (detail 2a) is a catch word which signals to the binder of the manuscript that the next quire starts with these words. This system is found elsewhere in the manuscript, such as *fructus* on fol. 148^{v}, which anticipates the text on fol. 149^{r}. Details 2a and 2b show that the text up to the highlighted *in ordine* of each copy is identical, yet the text on the following folio of BN 503 does not follow on in the same way as BN 12018. Instead it begins with a new text on the following folio, indicating some of the text to be missing. The quire following *in ordine* as well as the images contained within have clearly been separated from the current codex.

It is still possible that the diagrams of the wheels-within-wheels never existed and that the removal of this text could be explained by the removal of the diagrams of the vision which follow them in BN 12018. The text which follows the removed quire indicates that this is not the case as it is identical to the text between the 'wheels-within-wheels' and the vision diagrams in BN 12018. It is far more likely that whoever separated the leaves from the book was only interested in the illuminations, and thus removed the two sets of diagrams and left the text in-between within the manuscript, rather than removing the second set whilst also making the effort to remove the second part of the text (beginning *in ordine*). In summary, it is clear that the same wheels-within-wheels images found in BN 12018 also existed in BN 503.





Detail 2a (left): BN 503, fol. 42^{v} (detail). Photo: S. Griffin, © Bibliothèque nationale de France

Detail 2b (right): BN 12018, fol. 111^{r} (detail). Photo: S. Griffin, © Bibliothèque nationale de France

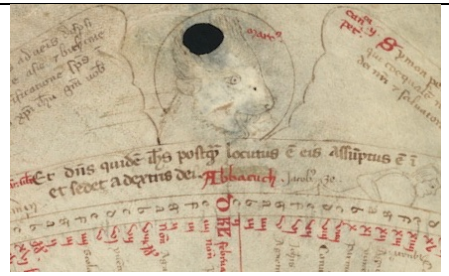
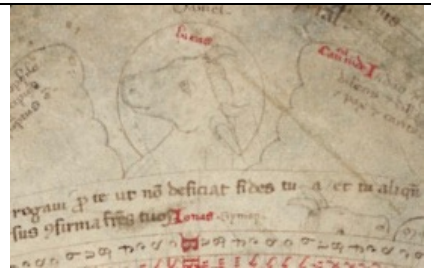
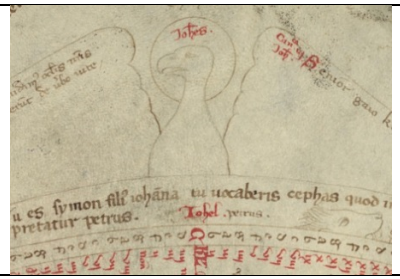
	Opicinus, Palatinus, fol. 14^{r} (c. 1334/5, details from fig. 1)	BN 503, (1320-21, details from fig. 41)	BN 12018, fol. 125^{r} (1313-15)	Pietro Vesconte, astronomical calendar (1318, details of fig. 10)
Lion of St Mark				
Angel of St Michael				
Ox of St Luke				
Eagle of St John				

Table 1: The Gospel beasts from *Palatinus A*, the *De Rotis* (BN 503 and BN 12018), and an illuminated calendar by Pietro Vesconte.

Book: *Liber…*	folio	Roman numeral at top of folio	Diagram Type
	-	Missing	-
oculorum	115r	II	wheels-within-wheels
	116r	III (fig. 37)	wheels-within-wheels
	117r	IIII	wheels-within-wheels
	118r	IIIII	wheels-within-wheels
	123r	VI	four wheels of the vision
	124r	VII (fig. 38)	four wheels of the vision
	125r	VIII	four wheels of the vision
	126r	VIIII	four wheels of the vision
aspectuum	136v	X	One wheel close up
	140r	XI	One wheel close up
	144v	XII	One wheel close up
	147r	XIII	One wheel close up
mysteriorum	258r	XIIII	Four wheels within one
	259r	XV	Two wheels within one
	260r	XVI (fig. 40)	Four wheels within one
	261r	XVII	Four wheels within one
	262r	XVIII	Six wheels within one
	263r	XIX	Five wheels within one
	264r	XX	Six wheels within one
	265r	XXI	Six wheels within one
	-	Missing	-
	266r	XXIII	Six wheels within one
	267r	XXIIII	Mysteries of Christ (four wheels)
	268r	XXV (fig. 39)	Mysteries of Christ (four wheels)
	269r	XXVI	Mysteries of Christ (four wheels)
	270r	XXVII	Mysteries of Christ (four wheels)

Table 2: The Illuminated Diagrams of BN 12018

fol. 116[r] Wheel-within-wheels	fol. 124[r] Four wheels of the vision	fol. 144[r] One wheel close up	fol. 268[r] Four wheels within one
			

Table 3: Set of wheel diagrams from BN 12018

Image Sources: S. Griffin, © Bibliothèque Nationale de France

fol. 115r	fol. 116r	fol. 117r	fol. 118r
			

Table 4: Wheel-within-Wheels Diagrams in BN 12018

Image Source: S. Griffin, © Bibliothèque Nationale de France

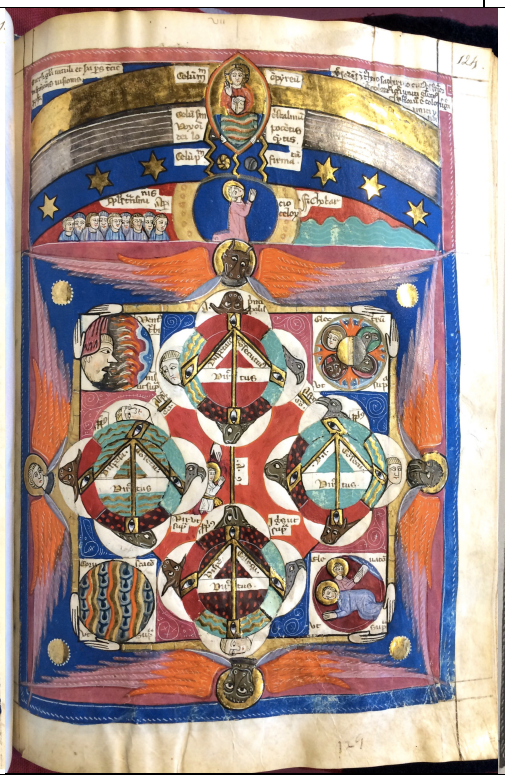
fol. 123[r]	fol. 124[r]	fol. 125[r]	fol. 126[r]
			

Table 5: Diagrams of the Four Wheels of the Vision in BN 12018

Image Sources:
fol. 123[r]: A. Stones, *Gothic Manuscripts 1260-1320 Part 2*, Vol. 1 (London, 2013), Plate 53, © Bibliothèque Nationale de France
fol. 124[r]: S. Griffin, © Bibliothèque Nationale de France
fol. 125[r]: A. Stones, *Gothic Manuscripts 1260-1320 Part 2*, Vol. 1 (London, 2013), Illustration 260, © Bibliothèque Nationale de France
fol. 126[r]: M. A. Bilotta, 'L'enluminure du Midi de la France dans le contexte des circulations culturelles méditerranéennes: un autre manuscrit juridique retrouvé enluminé à Avignon par l'atelier du Liber visionis Ezechielis (Arras, BM, ms. 499 [595]),' *Belvedere Meridionale*, Vol. 27, No. 2 (2005), pp.72-91, p.80 (fig. 7), © Bibliothèque Nationale de France

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Source: 'Atlas nautique de la mer Méditerranée et de la mer Noire / Petrus Vesconte de Janua fecit istas tabulas anno dni MCCCXIII,' *BnF Gallica*, http://gallica.bnf.fr/ark:/12148/btv1b5901108m, © Bibliothèque Nationale de France

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Source: 'Add. MS 27376,' *British Library: Catalogue of Illuminated Manuscripts*, https://www.bl.uk/catalogues/illuminatedmanuscripts/ILLUMIN.ASP?Size=mid&IllID=61158, © British Library

Figure 10: Astronomical Calendar (illuminated), Pietro Vesconte (1318). Venice, Museo Correr, port. 28
Photo: S. Griffin, © Museo Correr

Figure 11: *Mappamundi*/portolan chart of Pietro Vesconte in the *De Secreta* (first edition, 1320). BAV, MS Vat. Lat. 2972, folios 112^{v}-113^{r}
Source: 'Vat. Lat. 2972,' *DigiVatLib*, https://digi.vatlib.it/view/MSS_Vat.lat.2972, © Biblioteca Apostolica Vaticana

Figure 12: *Mappamundi*/portolan chart of Pietro Vesconte in the *De Secreta* (third edition, c. 1331, after 1327). London, British Library, Add. MS 27376, folios 187^{v}-188^{r}
'MS Add. 27376,' *British Library: Catalogue of Illuminated Manuscripts*, https://www.bl.uk/catalogues/illuminatedmanuscripts/ILLUMIN.ASP?Size=mid&IllID=61158, © British Library

Figure 13: San Zeno Wheel (1455). California, La Jolla Map and Atlas Museum
Source: 'Now and Forever: The Art of Medieval Time,' *The Morgan Library & Museum*, http://www.themorgan.org/exhibitions/now-and-forever, © Morgan Library and Museum

Figure 14: Liturgical Calendar of Astronomical Clock in St Mary's Church, Gdańsk (1464-70).
Source: Wikimedia Commons, 'Interior of the Church of St. Mary in Gdańsk,' is licensed under CC BY-SA 3.0

Figure 15: Reproduction of the *astrarium* of Giovanni de'Dondi, Smithsonian Museum.
Source: S. A. Bedini, F. R. Madison and A. Silvio, 'Mechanical Universe: The Astrarium of Giovanni de' Dondi,' *Transactions of the American Philosophical Society*, Vol. 56, No. 5 (1966), pp.1-69, p.46, © Smithsonian Institution

Figure 16: *Palatinus A* and isolated calendar detail, Opicinus de Canistris. Vatican City BAV, MS Pal. Lat. 1993, fol. 14^{r}

Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993, © Biblioteca Apostolica Vaticana

Figure 17: Isolated calendar detail, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 6^{r}
Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993, © Biblioteca Apostolica Vaticana

Figure 18: Isolated calendar detail, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 25^{v}
Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993, © Biblioteca Apostolica Vaticana

Figure 19: Isolated calendar detail, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 5^{r}
Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993, © Biblioteca Apostolica Vaticana

Figure 20: *Claves terminorum* in right column, above *ultimi termini*. Oxford, St John's College, MS 17, fol. 13^{v}
Source: 'Oxford. St John's College. MS 17; fol. 13v,' *The Calendar & the Cloister: Oxford, St John's College MS 17,* McGill University Library. Digital Collections Program, http://digital.library.mcgill.ca/ms-17, © St John's College (Oxford) and the Bodleian Library

Figure 21: *Computus* table (Austria, most likely 1216). London, British Library, Egerton MS 3661, fol. 14^{r}
Source: 'MS Egerton 3661,' *British Library: Catalogue of Illuminated Manuscripts*, https://www.bl.uk/catalogues/illuminatedmanuscripts/ILLUMIN.ASP?Size=mid&IllID=12847, © British Library

Figure 22: *Computus* table (Toledo, c. 1250-1400). London, British Library, Harley MS 3734, fol. 42^{r}
Source: 'MS Harley 3734,' *British Library: Digitised Manuscripts*, http://www.bl.uk/manuscripts/FullDisplay.aspx?ref=Harley_MS_3734, © British Library

Figure 23: Perpetual calendar (Germany, late-sixteenth century). New York, Metropolitan Museum of Art, Inv. no. 03.21.66
Source: 'Universal and Perpetual Calendar,' *Metropolitan Museum of Art*, https://www.metmuseum.org/art/collection/search/188865, CC0

Figure 24: Illustration of chain of movable feasts. Oxford, Bodleian Library, MS Laud Misc. 620, fol. 20^{r}
Photo: S. Griffin, © Bodleian Library

Figure 25: Detail of Liturgical Calendar, Reconstruction of *Astrarium* by Thwaites and Reed Ltd. (1974). London, Science Museum, Inv. no. 1974-386

Source: https://collection.sciencemuseum.org.uk/objects/co7/reconstruction-of-dondis-astronomical-clock-1974-astronomical-clock-replica, © The Board of Trustees of the Science Museum

Figure 26: *The Nativity and the Adoration of the Magi* (c. 1325-30), Pseudo-Jacopino di Francesco,. North Carolina Museum of Art
Source: 'The Nativity and the Adoration of the Magi,' *NCMA: Permanent Collection*,' http://ncartmuseum.org/art/detail/the_nativity_and_the_adoration_of_the_magi, © North Carolina Museum of Art

Figure 27: Dial emendations, detail of *Palatinus A*, Opicinus de Canistris. Vatican City, Vatican Library, Pal. Lat. 1993, fol. 14^{r}
Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993, © Biblioteca Apostolica Vaticana

Figure 28: Lunar diagram. London, British Library, Royal MS 12 C XVII, fol. 48^{r}
Source: 'Royal MS 12 C XVII,' *British Library: Catalogue of Illuminated Manuscripts*, https://www.bl.uk/catalogues/illuminatedmanuscripts/ILLUMIN.ASP?Size=mid&IllID=33462, © British Library

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Source: 'Astrolabe 48213,' *Astrolabe Catalogue (Museum of the History of Science, Oxford)*, https://www.mhs.ox.ac.uk/astrolabe/catalogue/browseReport/Astrolabe_ID=165.html, © Museum of the History of Science (Oxford)

Figure 30: Astronomical Volvelle (c. 1424?). Oxford, Bodleian Library, MS Ashmole 30, fol. 25^{r}
Photo: S Griffin, © Bodleian Library

Figure 31: Detail of Gospel animals, *Palatinus A*, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 14^{r}
Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993', © Biblioteca Apostolica Vaticana

Figure 32: Detail of *Liber ezechielis* (legend), Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 5^{r}
Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993', © Biblioteca Apostolica Vaticana

Figure 33: Cherub diagram, *The Howard Psalter* (East Anglian, c. 1310-20). London, British Library, Arundel MS 83-I, fol. 5^{v}
Source: M. J. Carruthers, 'Ars oblivionalis, ars inveniendi: The Cherub Figure and the Arts of Memory,' *Gesta*, Vol. 48, No. 2 (2009), pp.99-117, p.110, © British Library

Figure 34: Rose window (thirteenth century). Apulia, Ruvo Cathedral
Source: Wikimedia Commons, 'Cathedral (Ruvo di Puglia),' is licensed under CC BY-SA 3.0

Figure 35: Oxford-Paris-London Bible Moralisée (thirteenth century, Paris). BnF, MS Lat. 11560. a: fol. 186^{r}; b: 186^{r}; c: fol. 187^{v}
Source: 'Emblèmes bibliques, volume comprenant la fin de Job, le Psautier, les livres de Salomon et les Prophètes,' *BnF Gallica*, http://gallica.bnf.fr/ark:/12148/btv1b10538038j/f375.item.r=11560 and http://gallica.bnf.fr/ark:/12148/btv1b10538038j/f378.item.r=11560, © Bibliothèque Nationale de France

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Source: M. Reeves and B. Hirsch-Reich, *The Figurae of Joachim of Fiore* (Oxford, 1972), Plate 28, © Corpus Christi College (Oxford)

Figure 37: *Descriptio Rote sive iuxta vitulum Et secunda pars sive dispositionis*, Henricus de Carreto, *De Rotis Ezechielis* (c. 1313-15). BnF, MS Lat. 12018, fol. 116^{r}
Photo: S. Griffin, © Bibliothèque nationale de France

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Photo: S. Griffin, © Bibliothèque nationale de France

Figure 40: Henricus de Carreto, *De Rotis Ezechielis* (c. 1313-15). BnF, MS Lat. 12018, fol. 260^{r}
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Figure 41: The Wheel of Ezekiel: the Preeminence of the Face of the Lion, Full-page illumination taken from Henricus de Carreto's *De Rotis Ezechielis* (c. 1320-21). BnF, MS Lat. 503
Photo: Provided by Dr. Jörn Günther Rare Books, © Dr. Jörn Günther Rare Books

Figure 42: Commentary on the Tragedies of Seneca, illuminated by the *Queste* Master. Vatican City, BAV, MS Urb. Lat. 355, folios 1^{v} and 2^{r}
Source: 'MS Urb. Lat. 355,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Urb.lat.355, © Biblioteca Apostolica Vaticana

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Source: 'Copy of Mosaic by Pietro Cavallini on the Facade of the Basilica di S. Paolo Fuori le Mura,' *National Galleries Scotland*, https://www.nationalgalleries.org/art-and-artists/14312/copy-mosaic-pietro-cavallini-facade-basilica-di-s-paolo-fuori-le-mura, © National Galleries Scotland

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Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993', © Biblioteca Apostolica Vaticana

Figure 45: Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 25^{r}
Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993', © Biblioteca Apostolica Vaticana

Figure 45a: Detail of top magnification, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 25^{r}
Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993', © Biblioteca Apostolica Vaticana

Figure 45b: Detail of lower magnification, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 25^{r}
Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993',
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Figure 45c: Diagram of the magnifications of figures 1a and 1b.
Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993', © Biblioteca Apostolica Vaticana

Figure 46: Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 24^{v}
Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993', © Biblioteca Apostolica Vaticana

Figure 46a: Detail of top magnification, Opicinus de Canistris. Vatican City, BAV, Pal. Lat. 1993, fol. 24^{v}
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Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993', © Biblioteca Apostolica Vaticana

Figure 47a: Diagram of cycles of time in Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 6^{r}
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Figure 48a: Detail of top magnification, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 13^{v}
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Figure 48b: Detail of lower magnification, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 13^{v}
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Figure 49: Opicinus de Canistris, Vatican City, BAV, MS Pal. Lat. 1993, fol. 9^{r}
Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993', © Biblioteca Apostolica Vaticana

Figure 50: Opicinus de Canistris, Vatican City, BAV, MS Pal. Lat. 1993, fol. 9^{v}
Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993', © Biblioteca Apostolica Vaticana

Figure 51: Opicinus de Canistris, Vatican City, BAV, MS Pal. Lat. 1993, fol. 17^{r}
Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993', © Biblioteca Apostolica Vaticana

Figure 52: *Wheel of Sevens* (thirteenth century). Archivio Capitolare di Vercelli
Source: Archivio Capitolare di Vercelli, © Archivio Capitolare di Vercelli

Figure 53: *Mysterium Ecclesiae*, *Liber Figurarum* of Joachim of Fiore. Oxford, Corpus Christi College MS 255A, fol. 17^{v}
Source: M. Reeves and B. Hirsch-Reich, *The Figurae of Joachim of Fiore* (Oxford, 1972), Plate 32, © Corpus Christi College (Oxford)

Figure 54: Opicinus de Canistris (1350), Vatican City, BAV, MS Pal. Lat. 1993, fol. 26^{r}
Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993', © Biblioteca Apostolica Vaticana

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Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993', © Biblioteca Apostolica Vaticana

Figure 56: Calendar of Astronomical Clock, Prague Town Hall
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Figure 57: Calendar of Astronomical Clock (1472 onwards), St Mary's Church, Rostock
Source: Wikimedia Commons, 'Rostock St Marien Astronomische Uhr Ziffernblatt,' is licensed under CC BY-SA 3.0

Figure 58: Sphere of John Peckham, England (c. 1308-40). London, British Library, Arundel MS 83-II: *De Lisle Psalter*, fol. 123^{v}
Source: 'Arundel MS 83,' *British Library: Digitised Manuscripts*, http://www.bl.uk/manuscripts/Viewer.aspx?ref=arundel_ms_83_f117r, © British Library

Figure 59: *The Creation*, Wall painting by Piero di Puccio (1389-90). Pisa, Camposanto.
Source: Wikimedia Commons, 'Camposanto monumentale di Pisa, Piero di Puccio, Cosmografia,' is licensed under CC BY-SA 3.0

Figure 60: Diagram of the height of Christ, Book of Hours (French, fifteenth century). California, Huntington Library, HM 1104, fol. 214^{v}
Photo: S. Griffin, © Huntington Library

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Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993', © Biblioteca Apostolica Vaticana

Figure 61b: Detail of lower Christ crucified, *Palatinus A*, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 14^{r}
Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993', © Biblioteca Apostolica Vaticana

Figure 62: Detail of May, Calendar from farmer's almanac (English, fourteenth century). Oxford, Bodleian Library, MS Rawl. D. 939, Part II
Photo: S Griffin, © Bodleian Library

Figure 63: *The Creation*, Wall painting by Guisto de'Menabuoi (1376-78). Padua Duomo, Baptistery
Source: Wikimedia Commons, 'Giusto de'Menabuoi - Creazione - Battistero del Duomo di Padova' is licensed under CC BY-SA 3.0

Figure 64: *The Creation of the World and the Expulsion from Paradise*, Giovanni di Paolo (1445). New York, Metropolitan Museum of Art, Inv. no. 1975.1.31
Source: 'The Creation of the World and the Expulsion from Paradise,' *Metropolitan Museum of Art*, https://www.metmuseum.org/art/collection/search/458971, CC0

Figure 65: Lunar diagram, Opicinus de Canistris. Vatican City, BAV, MS Vat. Lat. 6435, fol. 51^{r}
Source: 'Vat. Lat. 6435,' *DigiVatLib*, https://digi.vatlib.it/view/MSS_Vat.lat.6435, © Biblioteca Apostolica Vaticana

Figure 66: Detail of Christ crucified over Jerusalem, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 6^{r}
Source: 'Pal. Lat. 1993,' *DigitVatLib*, https://digi.vatlib.it/view/MSS_Pal.lat.1993', © Biblioteca Apostolica Vaticana

Figure 67: Side Wound of Christ in the *Image du monde* of Gautier of Metz (c. 1320). BnF, MS Fr. 574, fol. 140^{v}
Source: 'Gossouin de Metz, Image du monde,' *BnF Gallica*, http://gallica.bnf.fr/ark:/12148/btv1b84526412/f294.item, © Bibliothèque Nationale de France

Figure 68: Side Wound of Christ (before 1349). New York, Metropolitan Museum of Art, The Cloisters Collection, MS 68.86, fol. 331^{r}
Source: Wikimedia Commons, CC0

Figure 69: *Ihesus-Maria* Clock Face (Delft, c. 1460-70) pasted into South Netherlandish Book of Hours (c. 1440). France, Private collection, fol. 13^{r}
Source: Rudy, K., 'Ihesus-Maria Clocks and Wounds,' in *Postcards on Parchment: The Social Lives of Medieval Books* (New Haven, 2015), pp.141-55, p.143, © Private Collection

Illustrations

Readers should note that high-quality images of the Palatinus and Vaticanus manuscripts are available on the Vatican Library's website:

Palatinus: https://digi.vatlib.it/view/MSS_Pal.lat.1993
Vaticanus: https://digi.vatlib.it/view/MSS_Vat.lat.6435

The Palatinus images reproduced here are stitched together from two separate images. Due to the size of the folios, the drawings were digitised in two halves.



Figure 1: *Palatinus A*, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 14^{r}

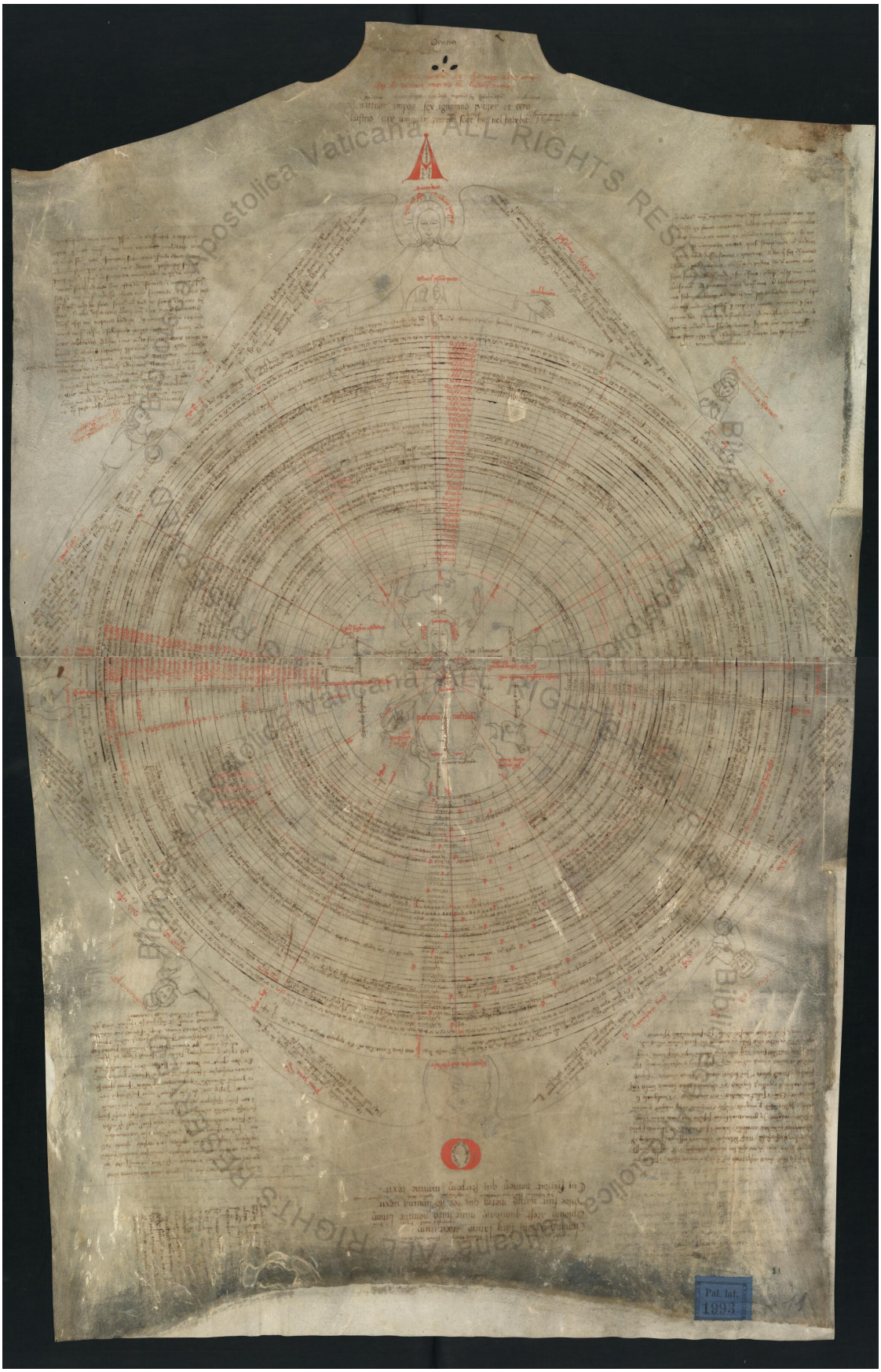


Figure 2: Autobiographical Calendar, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 11^{r}



Figure 3: Opicinus de Canistris (c. 1350). Vatican City, BAV, MS Pal. Lat. 1993, fol. 1[r]



Figure 4: Calendar of *Palatinus A*, Opicinus de Canistris (image edited by the author).
Vatican City, BAV, MS Pal. Lat. 1993, fol. 14[r]

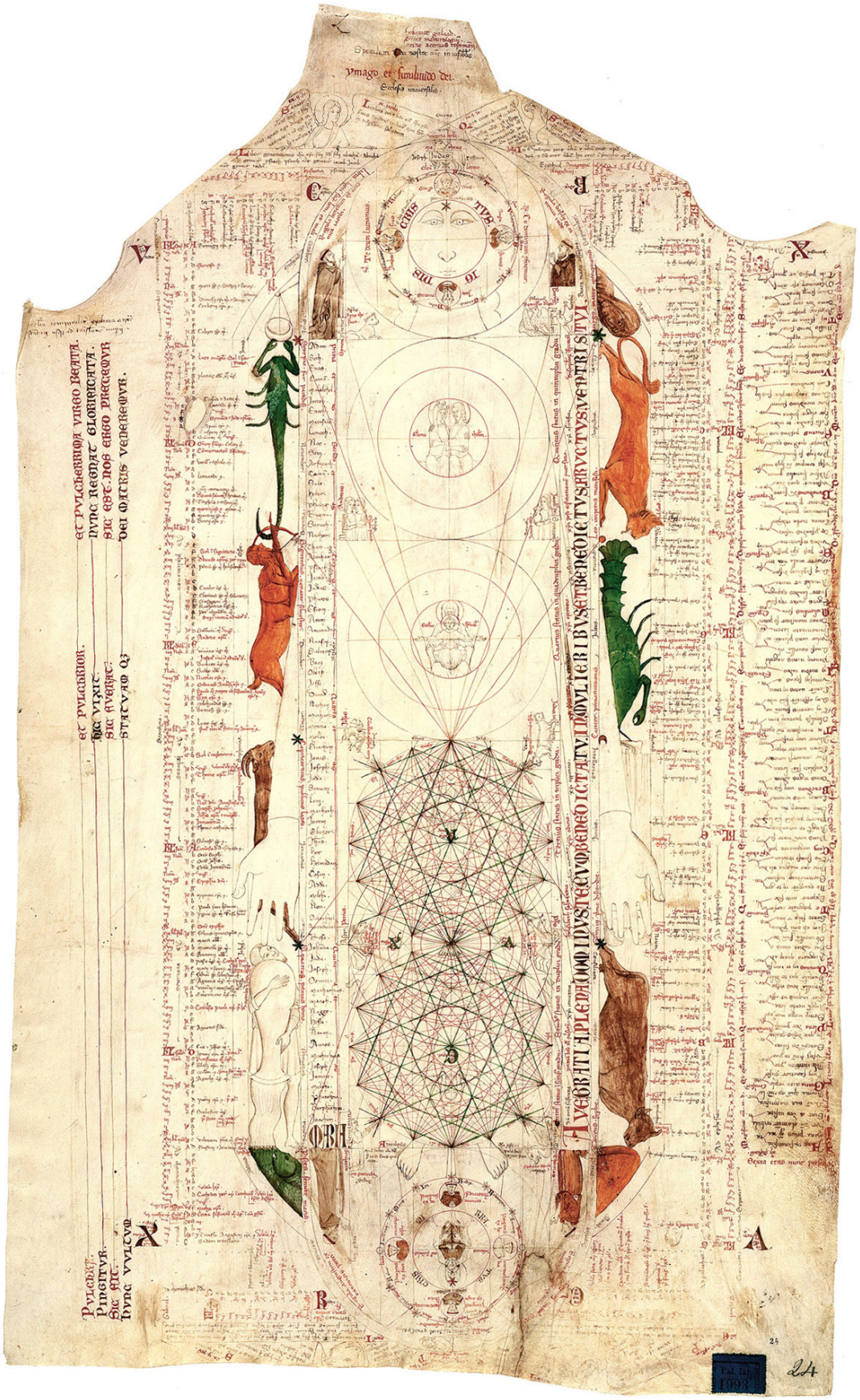


Figure 5: *Rectangular Calendar*, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 24^{r}

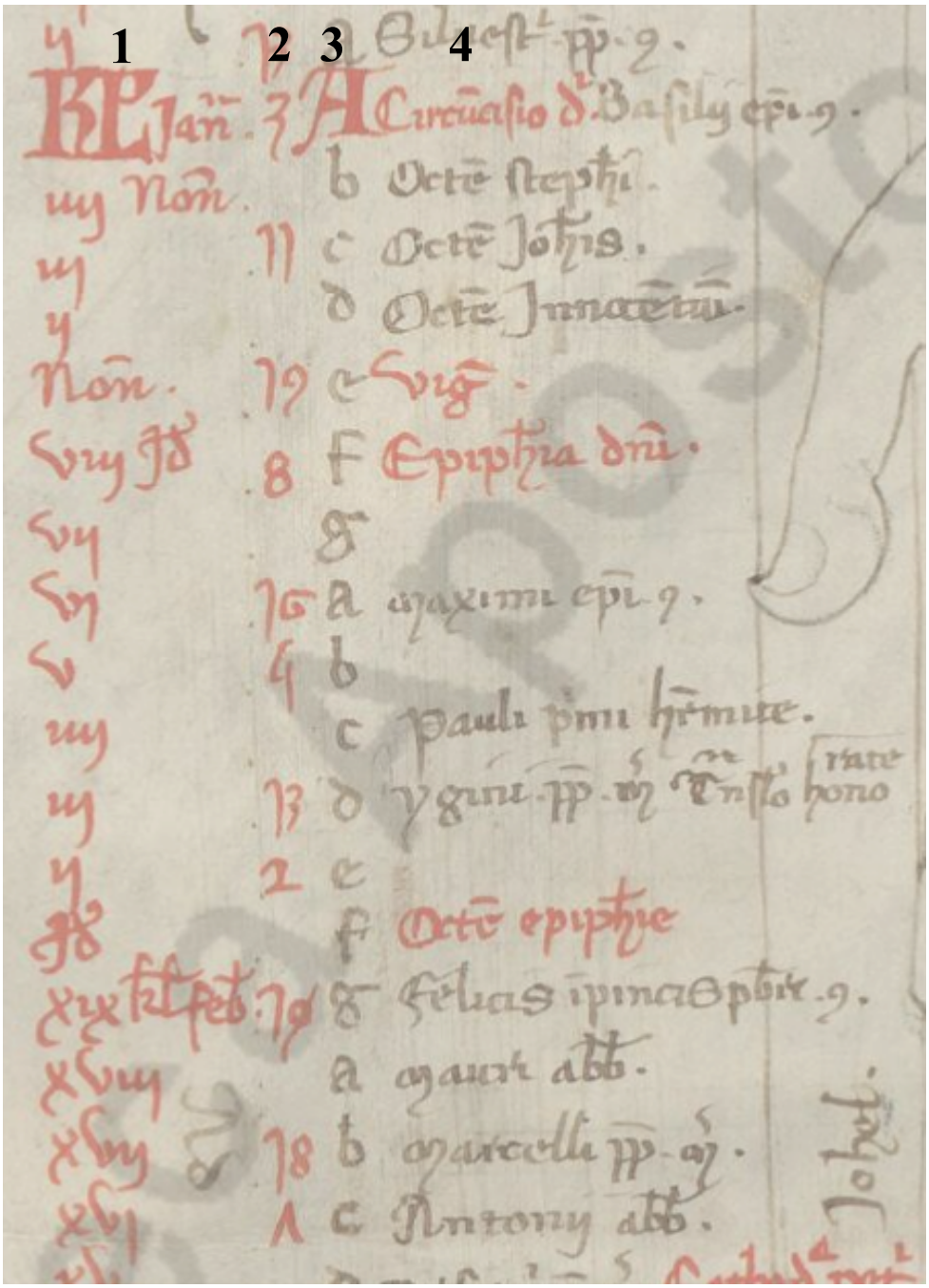


Figure 5a: Detail of calendar of *Rectangular Calendar* (numbers inserted by the author), Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 24^{r}

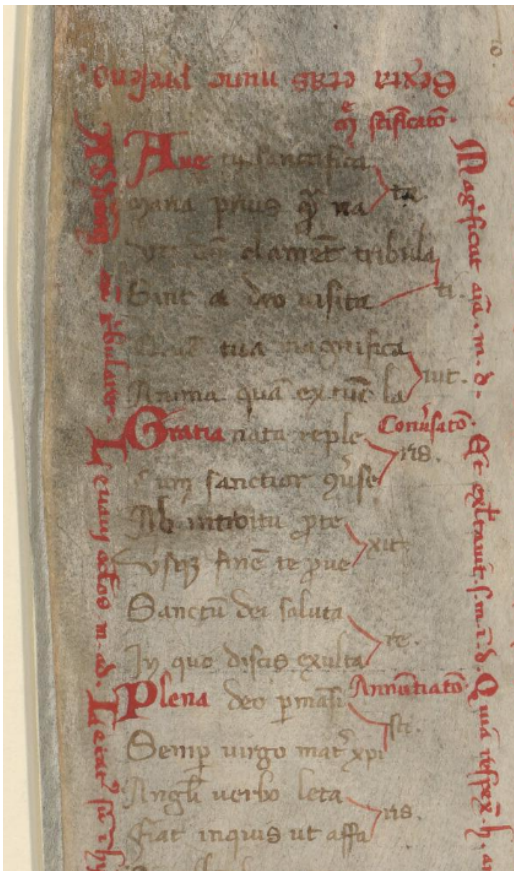


Figure 5b: Detail of *Rectangular Calendar*, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 24[r]

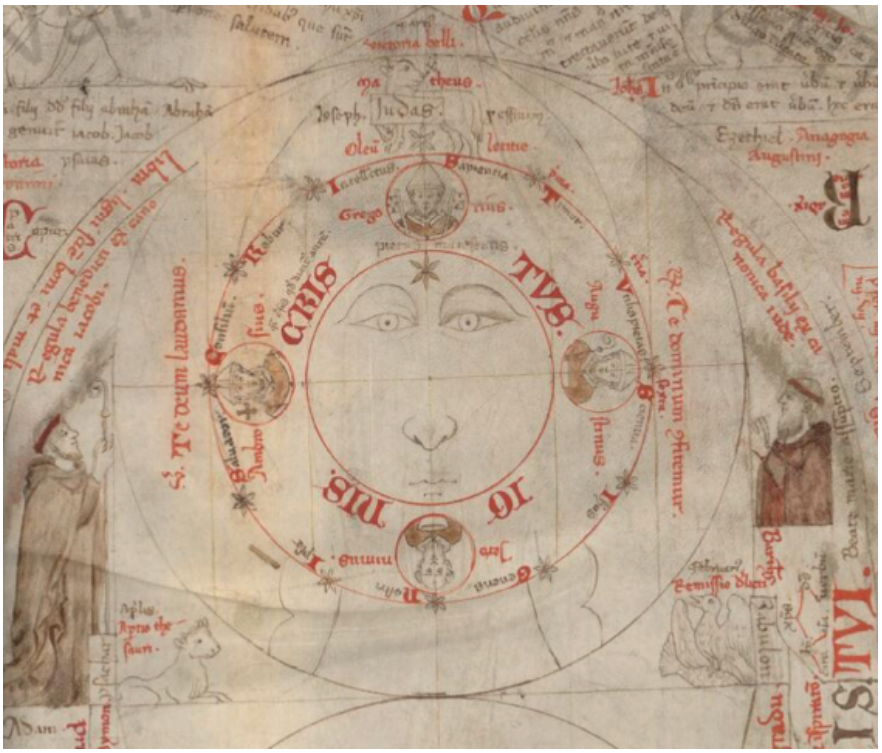


Figure 5c: Detail of *Rectangular Calendar*, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 24[r]

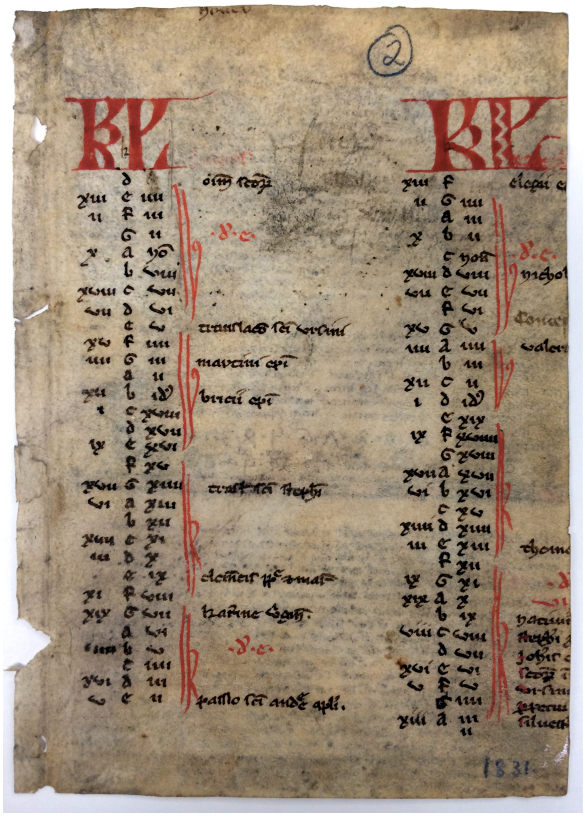


Figure 6: *Computus* sheet (early-fourteenth century). London, Wellcome MS 201

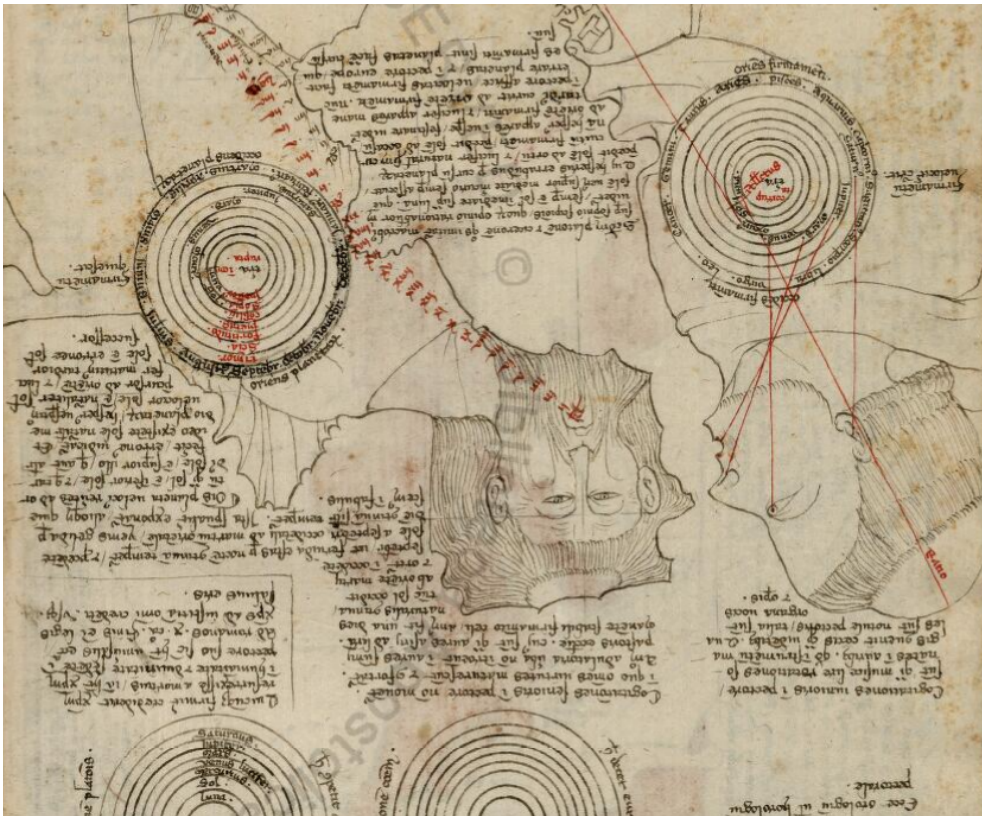


Figure 7: Detail of Vaticanus drawing, Opicinus de Canistris. Vatican City, BAV, MS Vat. Lat. 6435, fol. 69^{r}

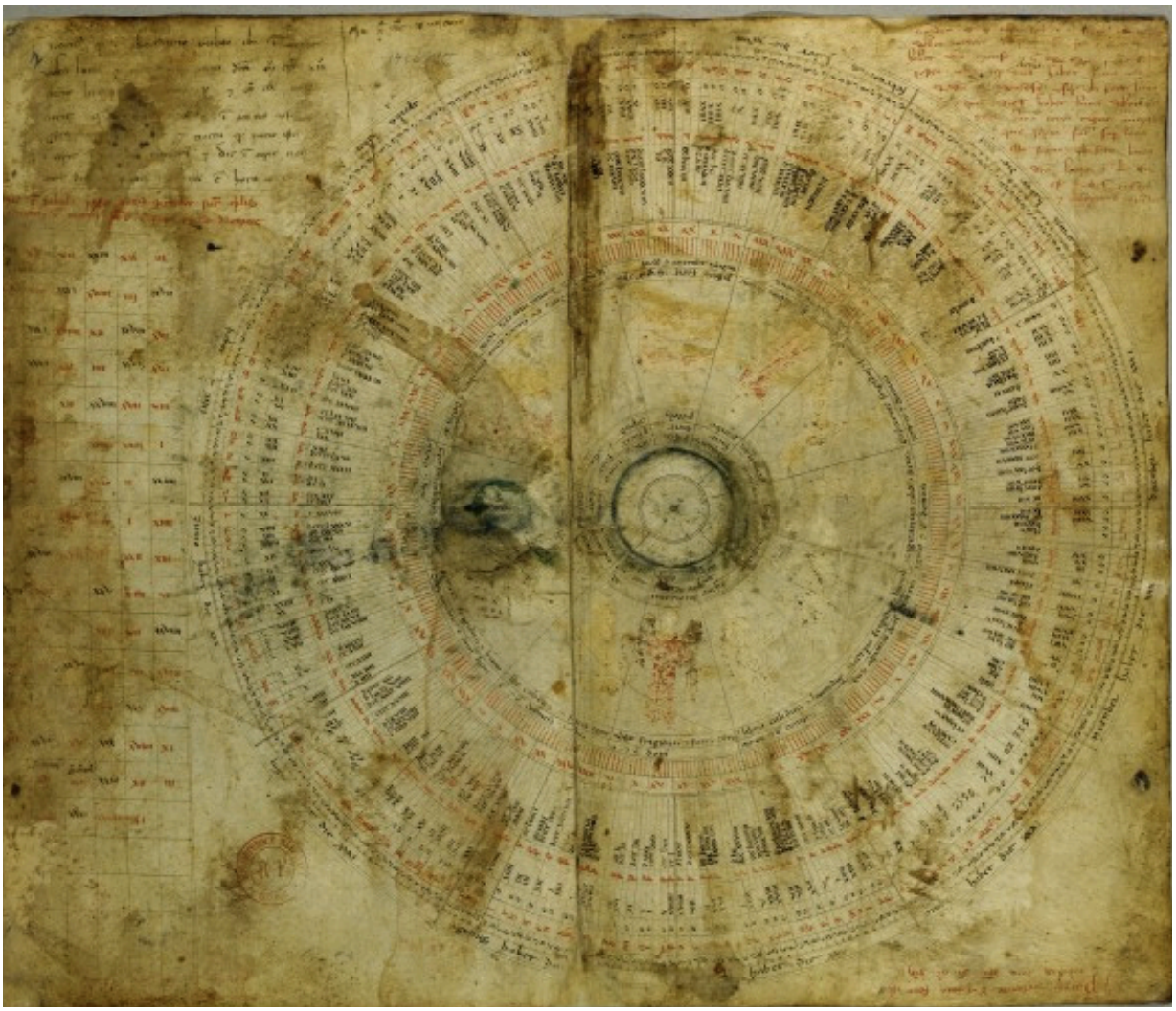


Figure 8: Astronomical Calendar (bare), Pietro Vesconte (1313). BnF, Cartes et Plans, GE DD-687

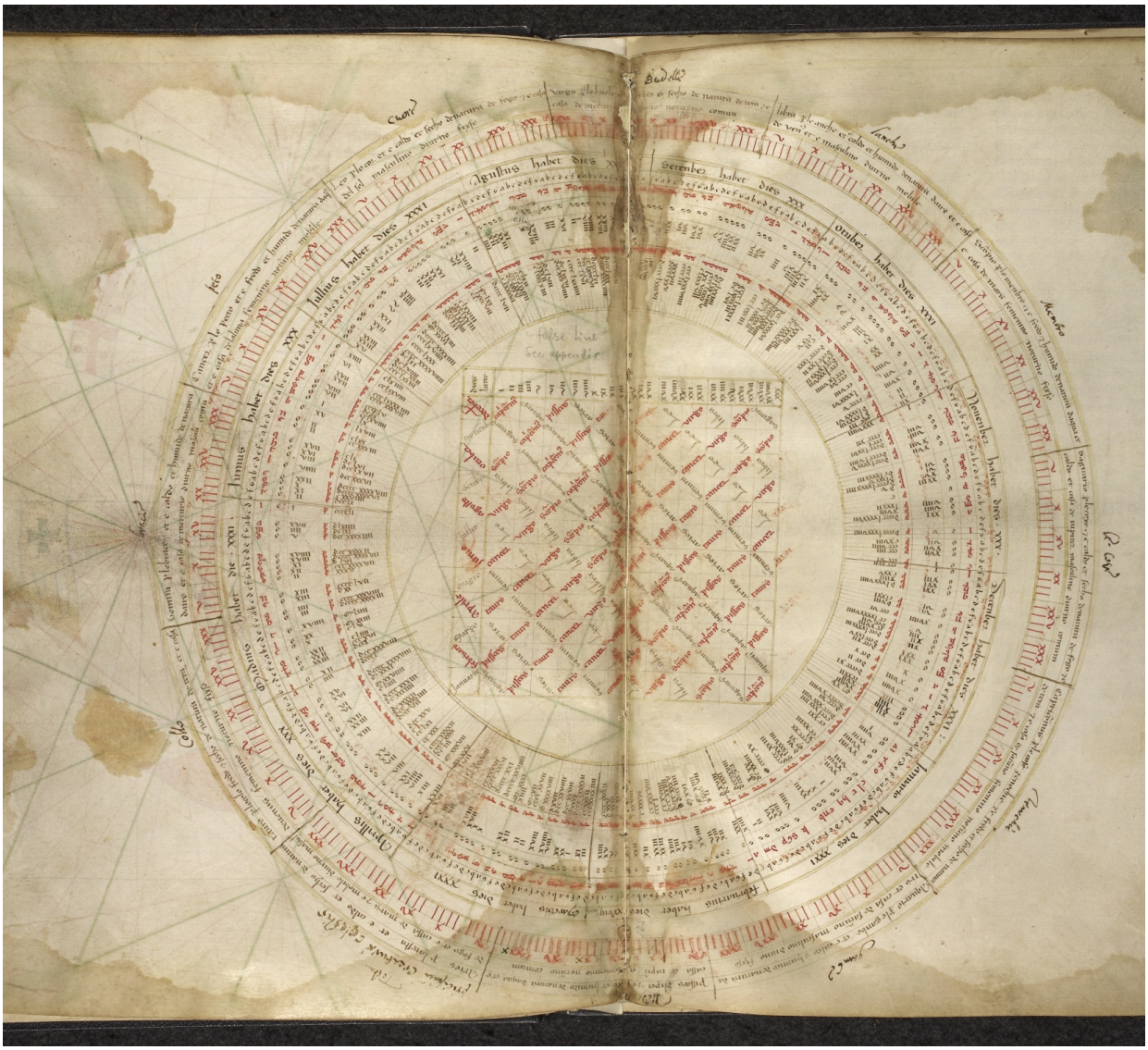


Figure 9: Astronomical Calendar (bare), Pietro Vesconte (c. 1331, after 1327). London, British Library, Add. MS 27376, folios 185^{v}-186^{r} (accompanies fig. 12)

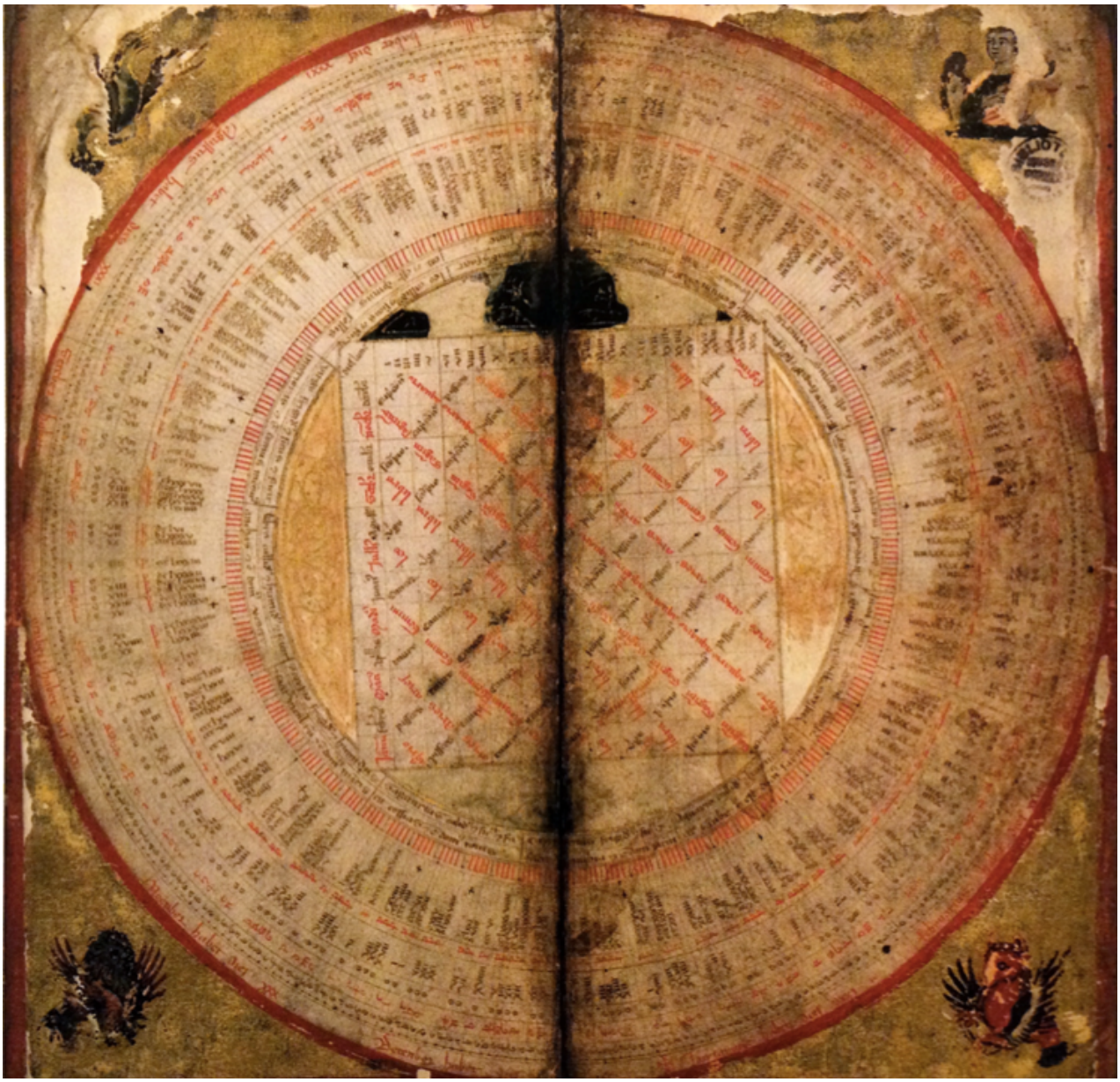


Figure 10: Astronomical calendar (illuminated), Pietro Vesconte (1318). Venice, Museo Correr, port. 28



Figure 11: *Mappamundi*/portolan chart of Pietro Vesconte in the *De Secreta* (first edition, 1320). Vatican City, BAV, MS Vat. Lat. 2972, folios 112^{v}-113^{r}



Figure 12: *Mappamundi*/portolan chart of Pietro Vesconte in the *De Secreta* (third edition, c. 1331, after 1327). London, British Library, Add. MS 27376, folios 187^{v}-188^{r} (accompanies fig. 9)



Figure 13: San Zeno Wheel (1455). California, La Jolla Map and Atlas Museum



Figure 14: Liturgical calendar of astronomical clock in St Mary's Church, Gdańsk (1464-70)

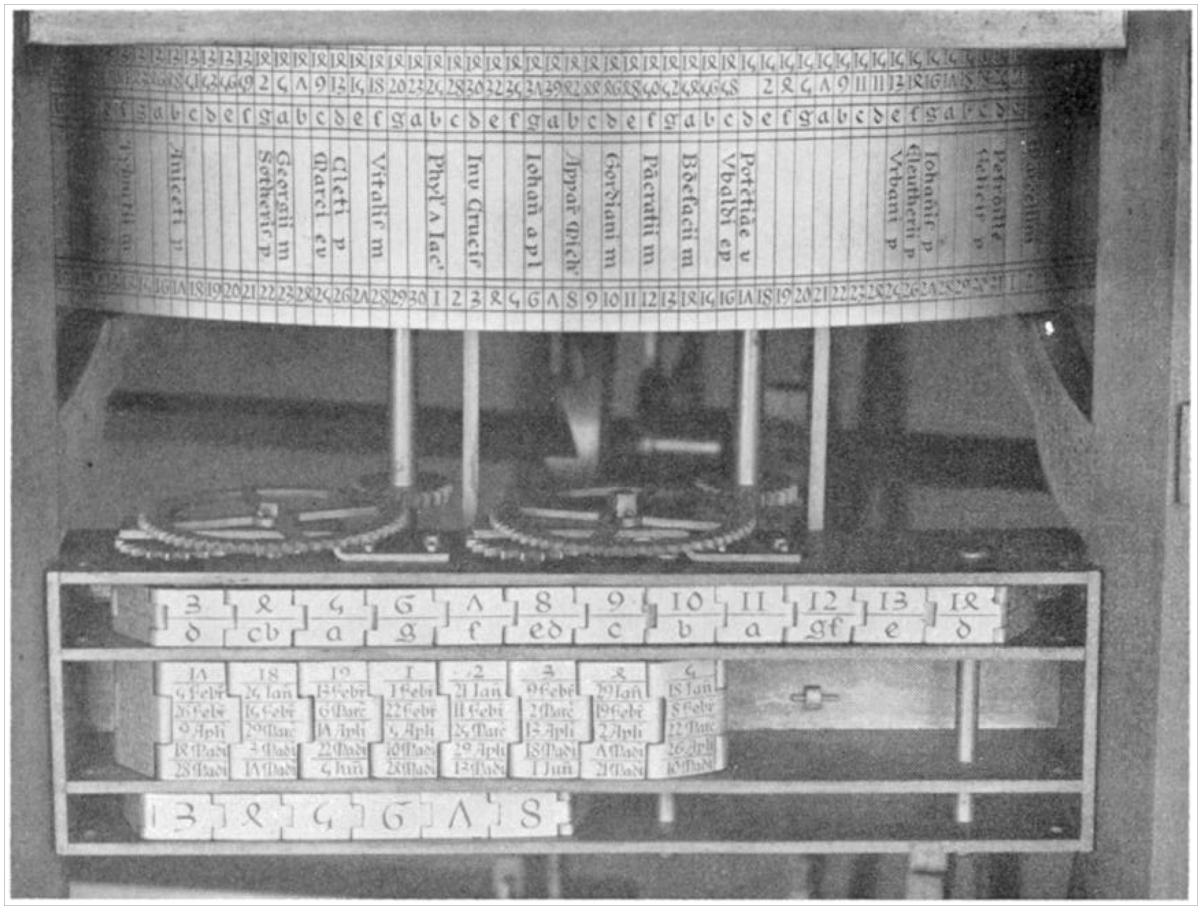


Figure 15: *Sanctorale* (above) and *temporale* (below) from the reproduction of Giovanni de'Dondi's *astrarium*. Washington D. C., Smithsonian Museum



Figure 16: *Palatinus A*, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 14r*

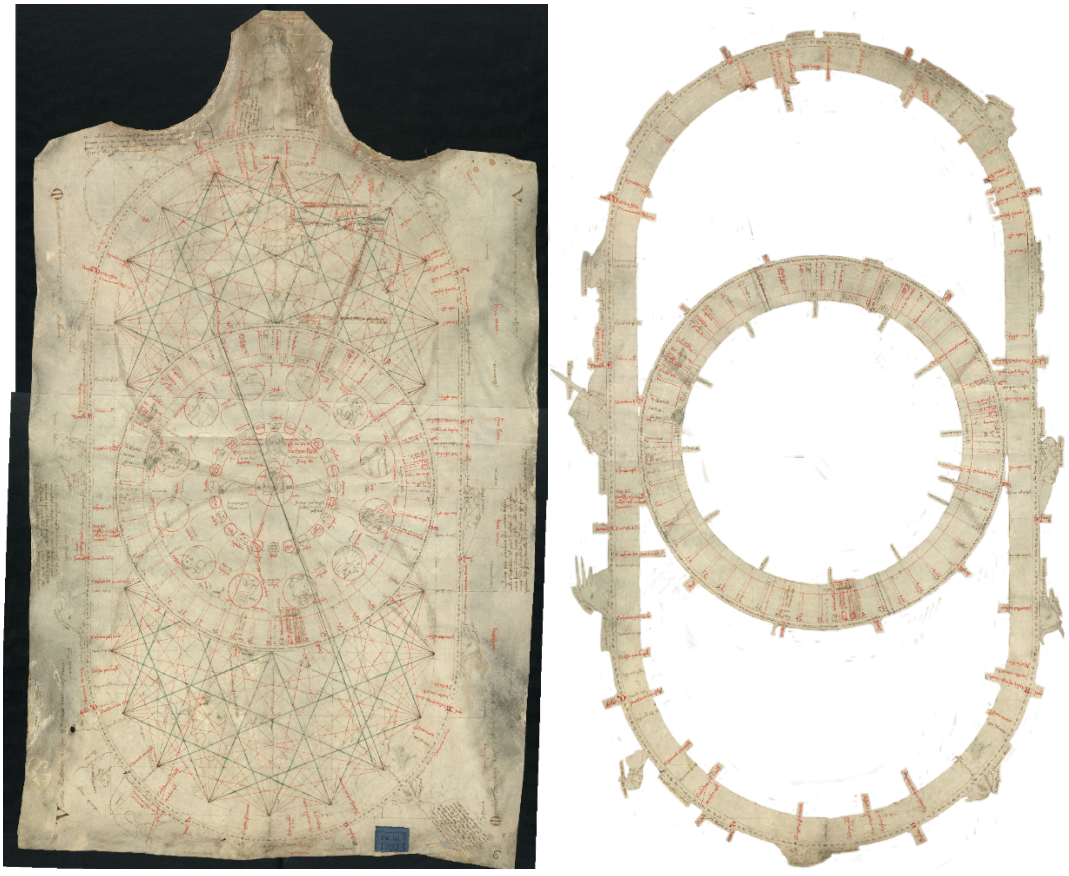


Figure 17: Opicinus de Canistris, Vatican City, BAV, MS Pal. Lat. 1993, fol. 6r*

* Images which highlight the calendars of the Palatinus drawings were edited by the author.

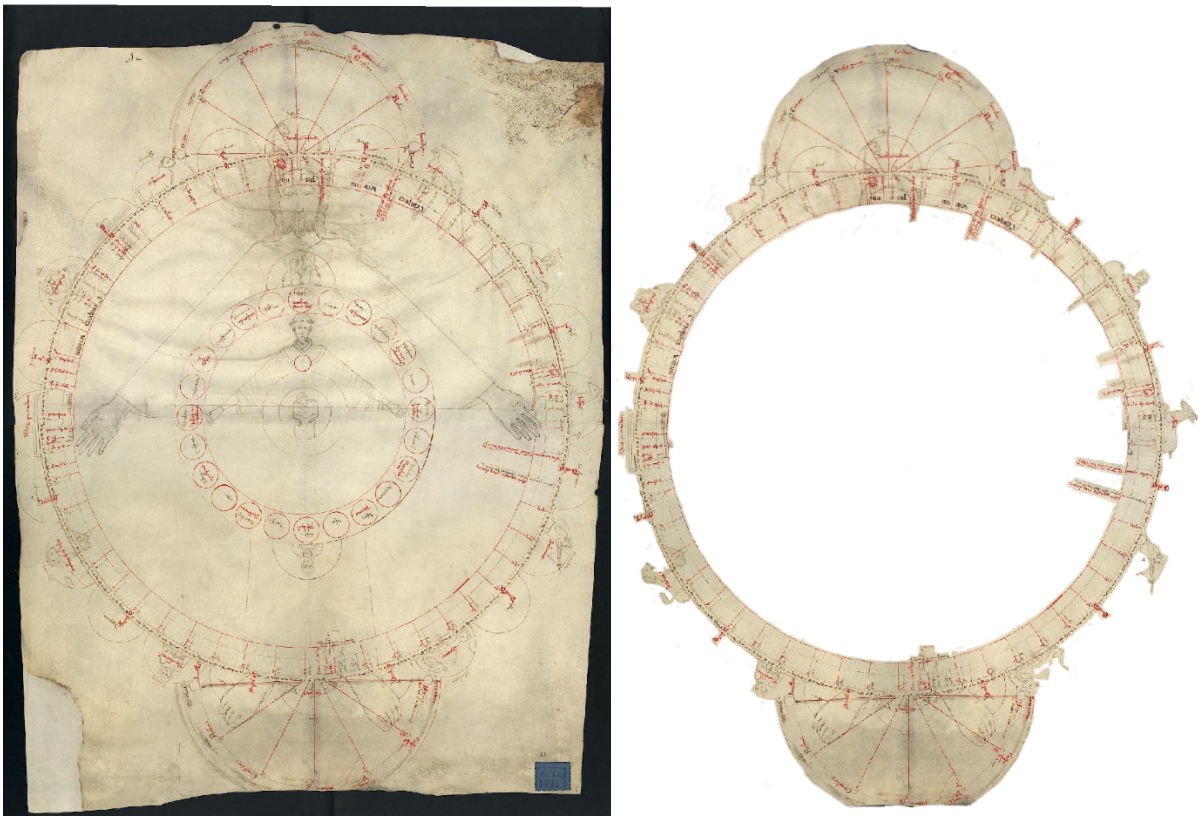


Figure 18: Opicinus de Canistris, Vatican City, BAV, MS Pal. Lat. 1993, fol. 25^{v}*



Figure 19: Opicinus de Canistris, Vatican City, BAV, MS Pal. Lat. 1993, fol. 5^{r}*

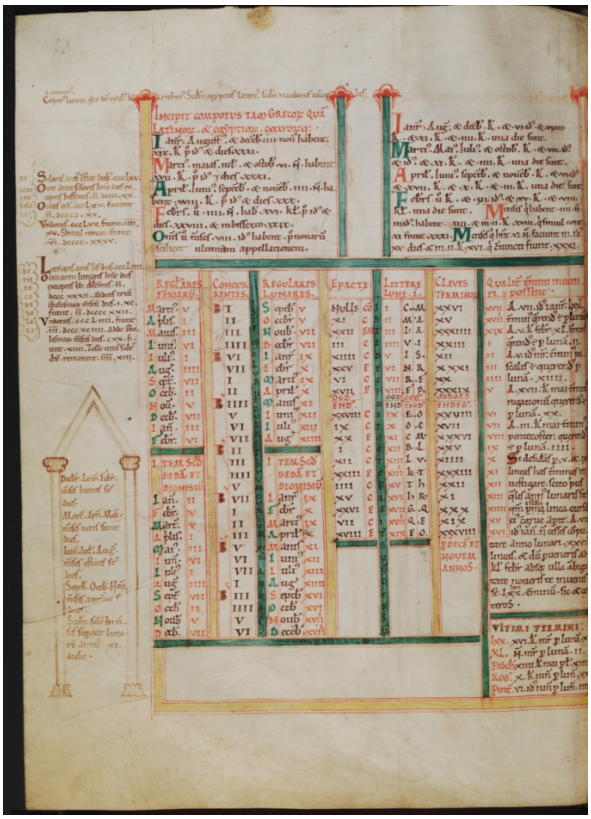


Figure 20: *Claves terminorum* in right column, above *ultimi termini*. Oxford, St John's College, MS 17, fol. 13^{v}





Figure 21: *Computus* table (Austria, most likely 1216). London, British Library, Egerton MS 3661, fol. 14^{r}

Figure 22: *Computus* table (Toledo, c. 1250-1400). London, British Library, Harley MS 3734, fol. 42^{r}



Figure 23: Universal and Perpetual Calendar (Germany, late-sixteenth century). New York, Metropolitan Museum of Art, Inv. no. 03.21.66

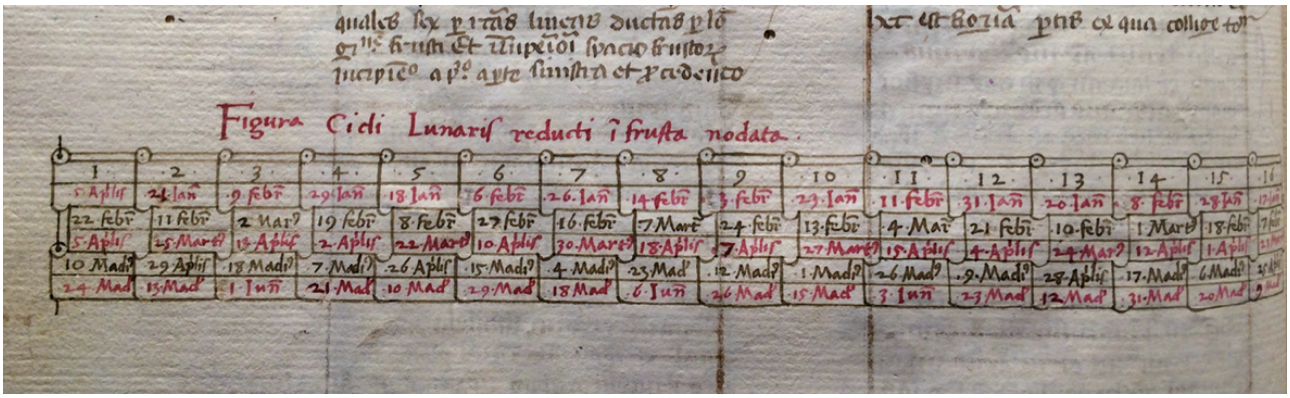


Figure 24: Illustration of chain of movable feasts. Oxford, Bodleian Library, MS Laud Misc. 620, fol. 20^{r}

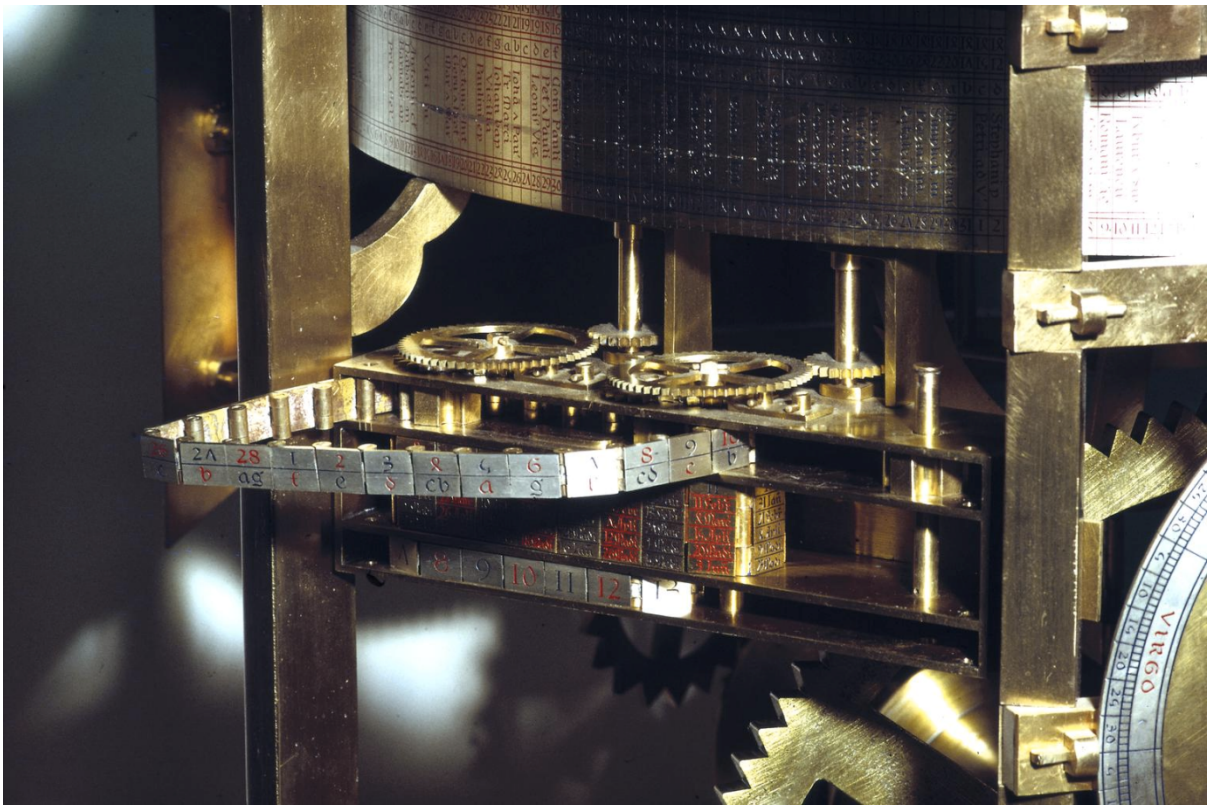


Figure 25: Detail of Liturgical Calendar, Reconstruction of the *Astrarium* by Thwaites and Reed Ltd. (1974). London, Science Museum, Inv. no. 1974-386



Figure 26: *The Nativity and the Adoration of the Magi* (c. 1325-30), Pseudo-Jacopino di Francesco. North Carolina Museum of Art

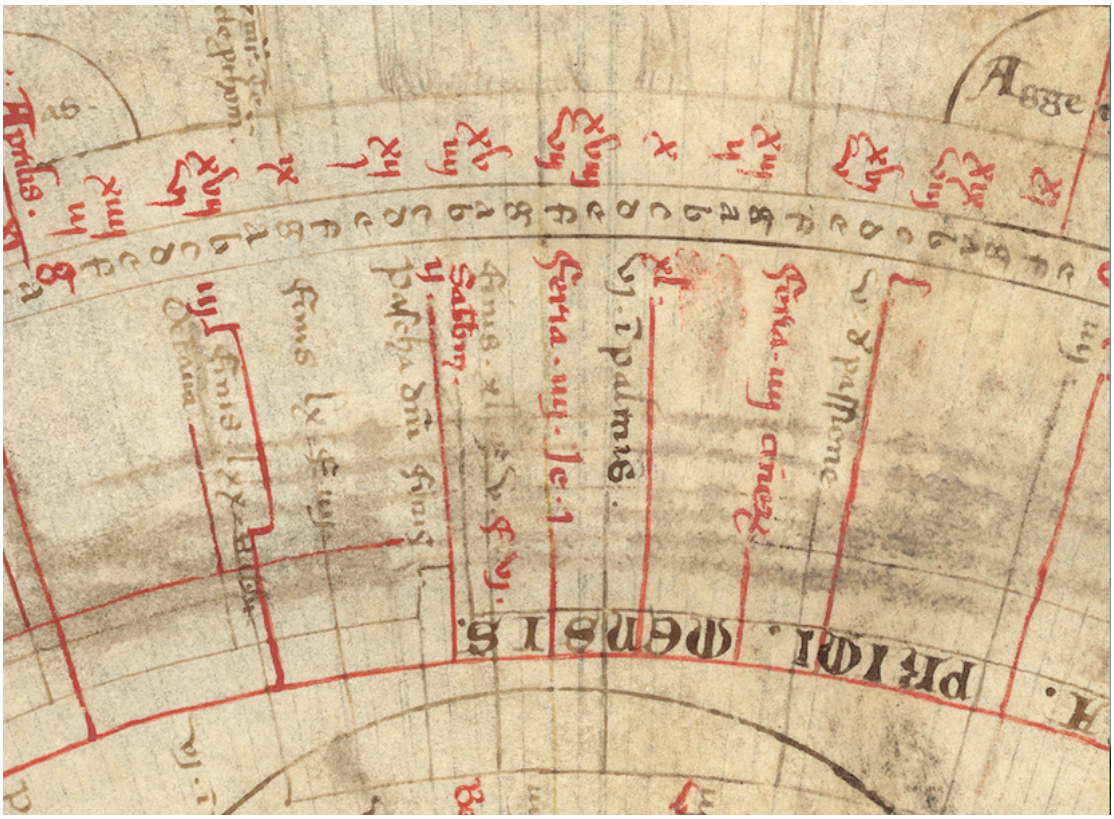


Figure 27: Dial emendations, detail of *Palatinus A*, Opicinus de Canistris. Vatican City, BAV, Pal. Lat. 1993, fol. 14[r]

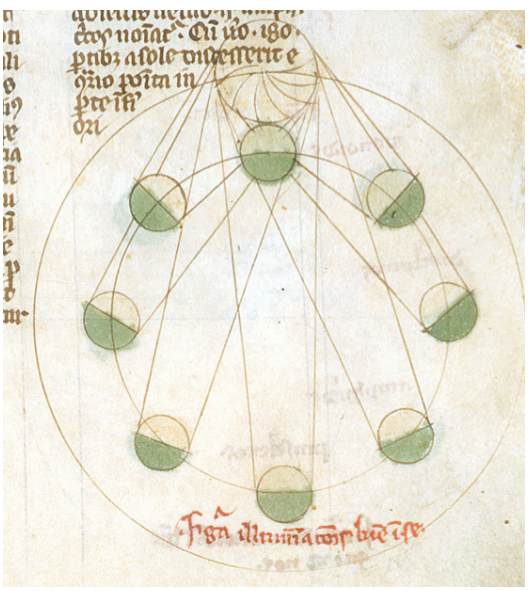




Figure 28: Lunar diagram. London, British Library, Royal MS 12 C XVII, fol. 48[r]

Figure 29: Geared Astrolabe, Muhammad ibn Abī Bakr al Ibarī (1221/22). Oxford, Museum of the History of Science, Inv. no. 48213

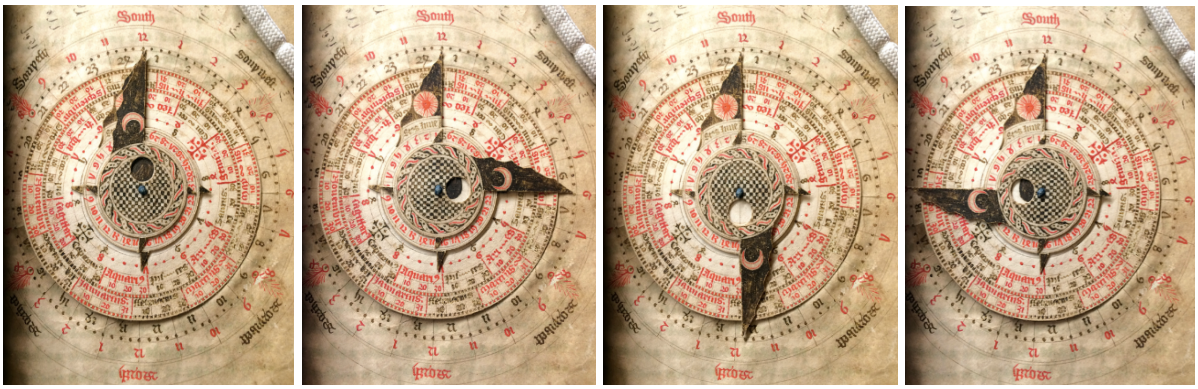


Figure 30: Astronomical volvelle (c. 1424?). Oxford, Bodleian Library, MS Ashmole 30, fol. 25^{r}



Figure 31: Detail of Gospel animals, *Palatinus A*, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 14r*

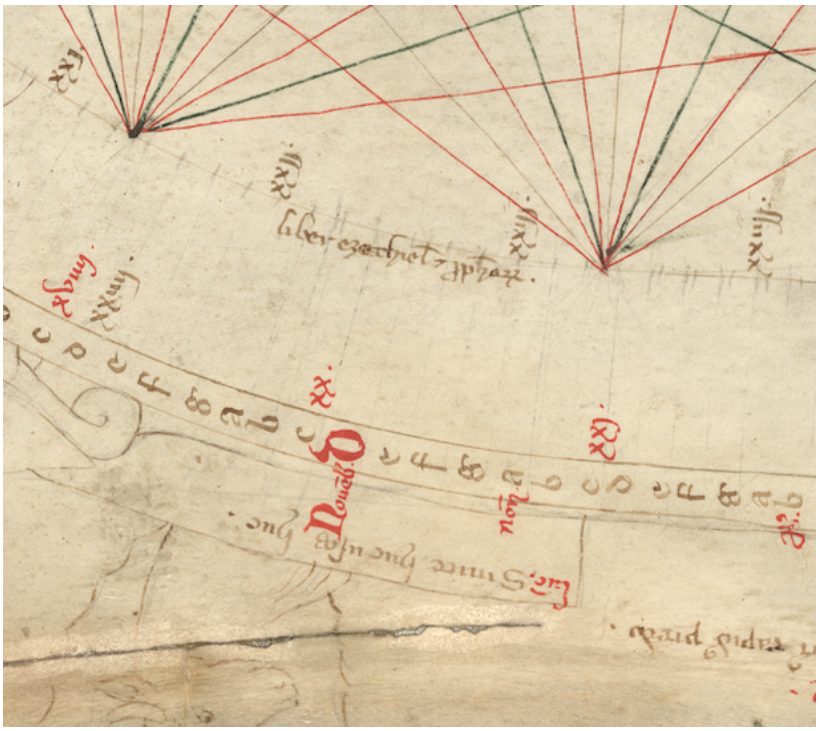


Figure 32: Detail of *Liber ezechielis* legend, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 5[r]



Figure 33: Cherub diagram, *The Howard Psalter* (East Anglian, c. 1310-20). London, British Library, Arundel MS 83-I, fol. 5[v]



Figure 34: Rose window (thirteenth century). Apulia, Ruvo Cathedral



Figure 35: Oxford-Paris-London Bible Moralisée (thirteenth century, Paris). BnF, MS Lat. 11560. a (top left): fol. 186^{r}; b (top right): 186^{r}; c (beneath): fol. 187^{r}

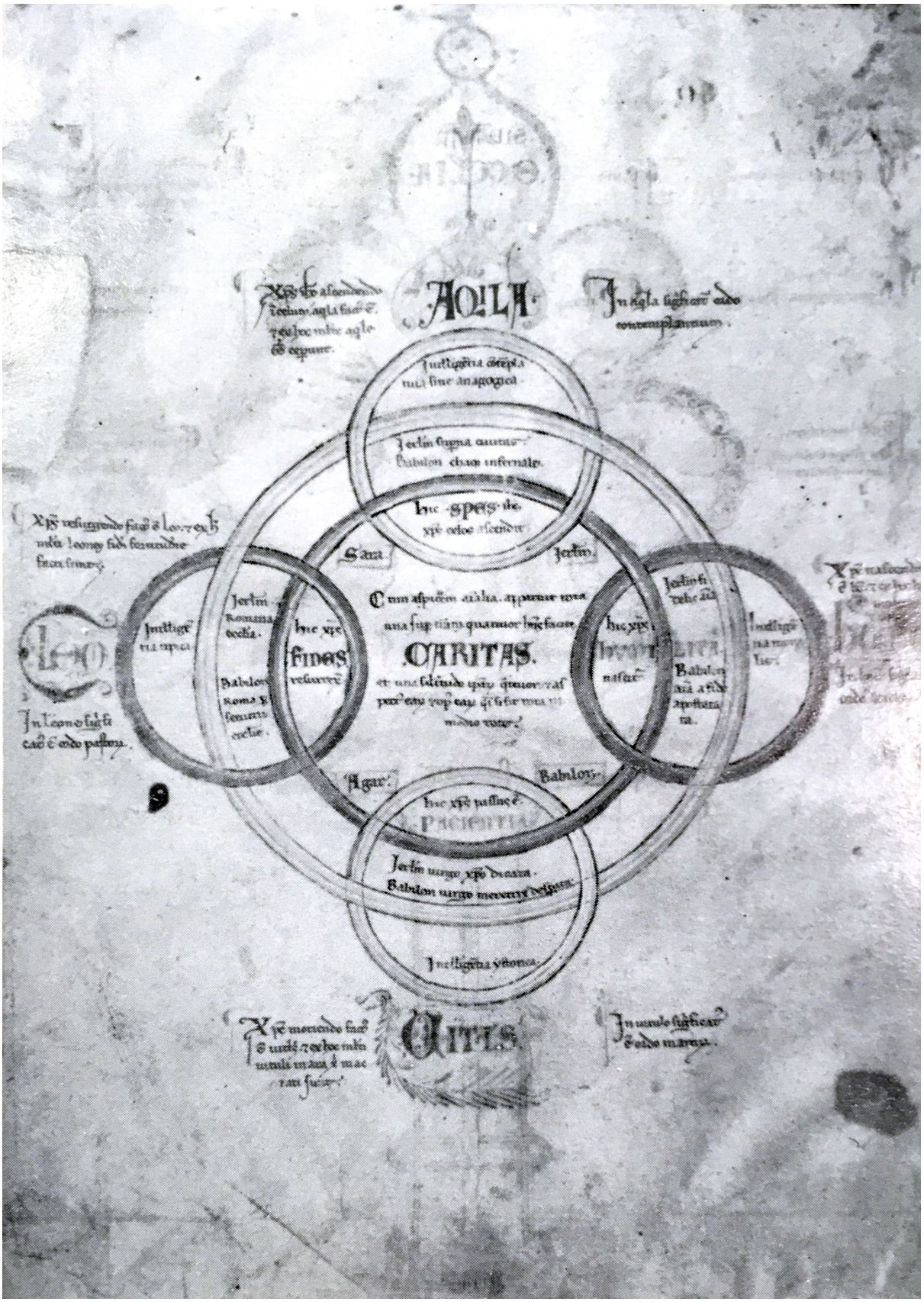


Figure 36: Wheels of Ezekiel, *Liber figurarum* of Joachim of Fiore. Oxford, Corpus Christi College, MS 225A, fol. 16^{v}



Figure 37: Wheel-within-wheels (*Descriptio Rote secunde iuxta vitulum. Et secunda pars secunde dispositionis*), Henricus de Carreto, *De Rotis Ezechielis* (c. 1313-15). BnF, MS Lat. 12018, fol. 116^{r}

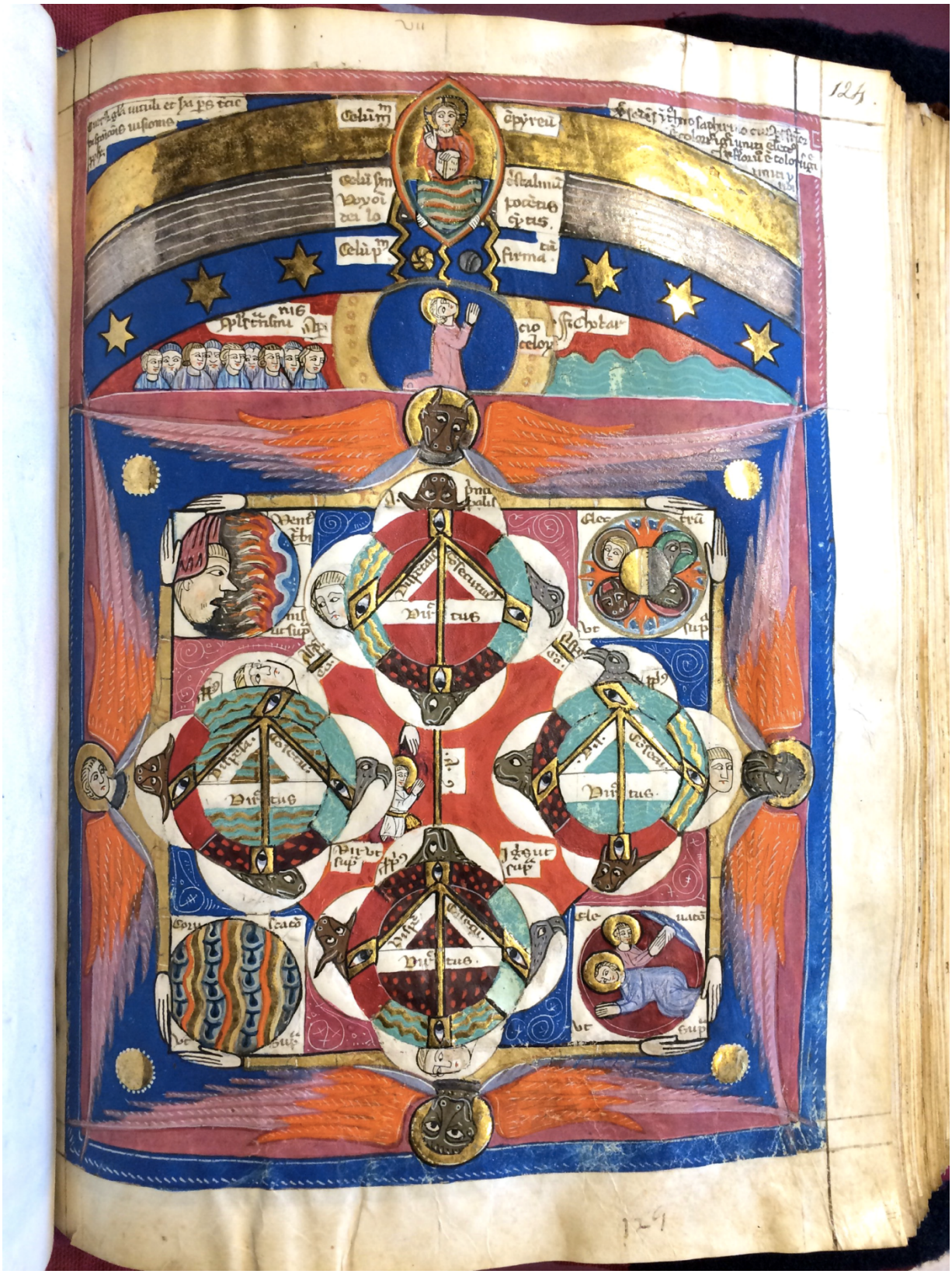


Figure 38: Diagram of the vision (no heading), Henricus de Carreto, *De Rotis Ezechielis* (c. 1313-15). BnF, MS Lat. 12018, fol. 124^{r}



Figure 39: Close up of the Wheel (*Decimo in principatu vidi veteris et novi testamenti conductationum (?) misteria dividerunt per misteria iiij rotarum inferius descriptarum*), Henricus de Carreto, *De Rotis Ezechielis* (c. 1313-15). BnF, MS Lat. 12018, fol. 268^{r}



Figure 40: Henricus de Carreto, *De Rotis Ezechielis* (c. 1313-15).
BnF, MS Lat. 12018, fol. 260^{r}

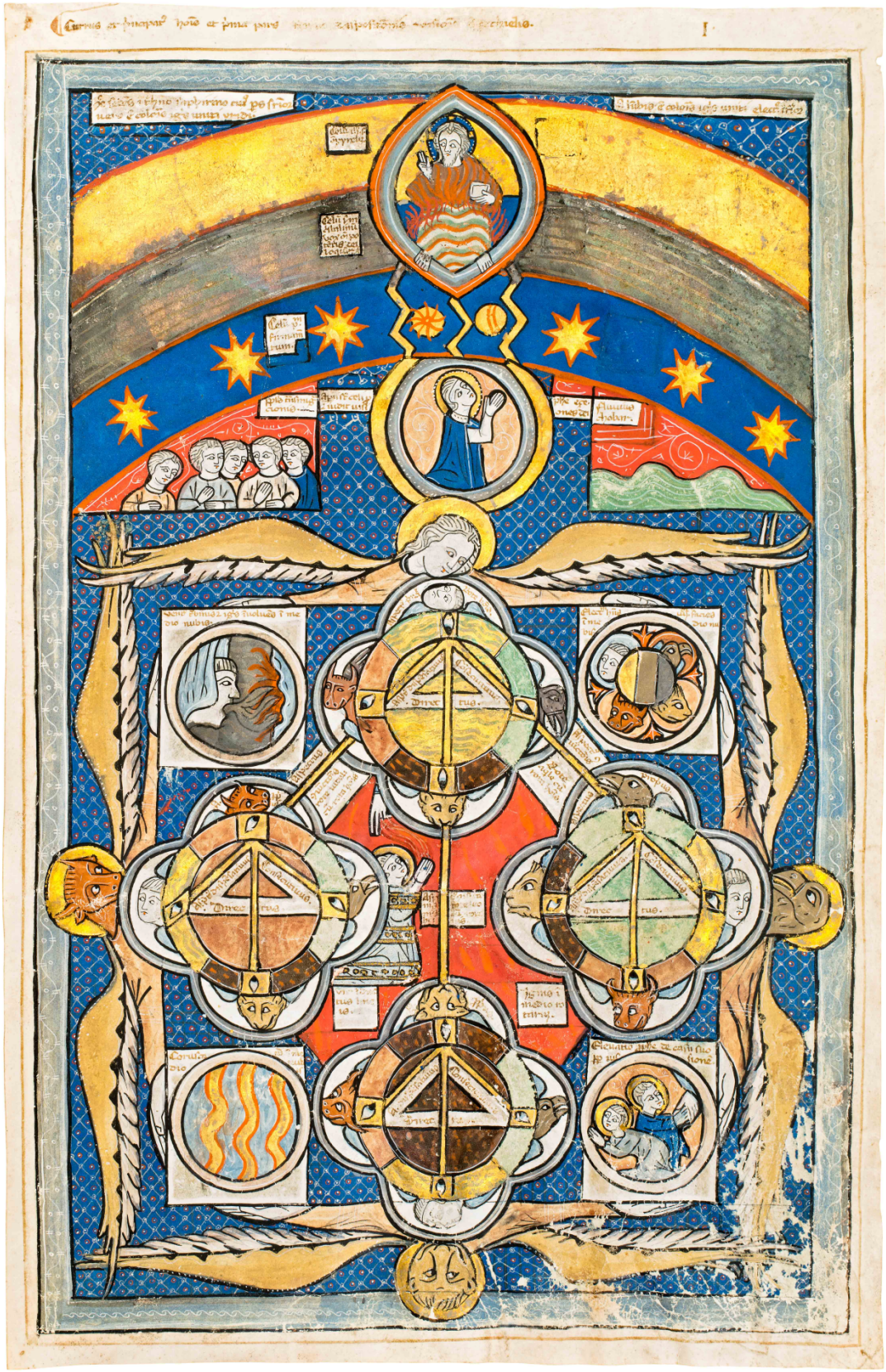


Figure 41: The Wheel of Ezekiel: the Preeminence of the Face of the Lion, Full-page illumination taken from Henricus de Carreto's *De Rotis Ezechielis* (c. 1320-21). Single leaf, taken from BnF, MS Lat. 503.

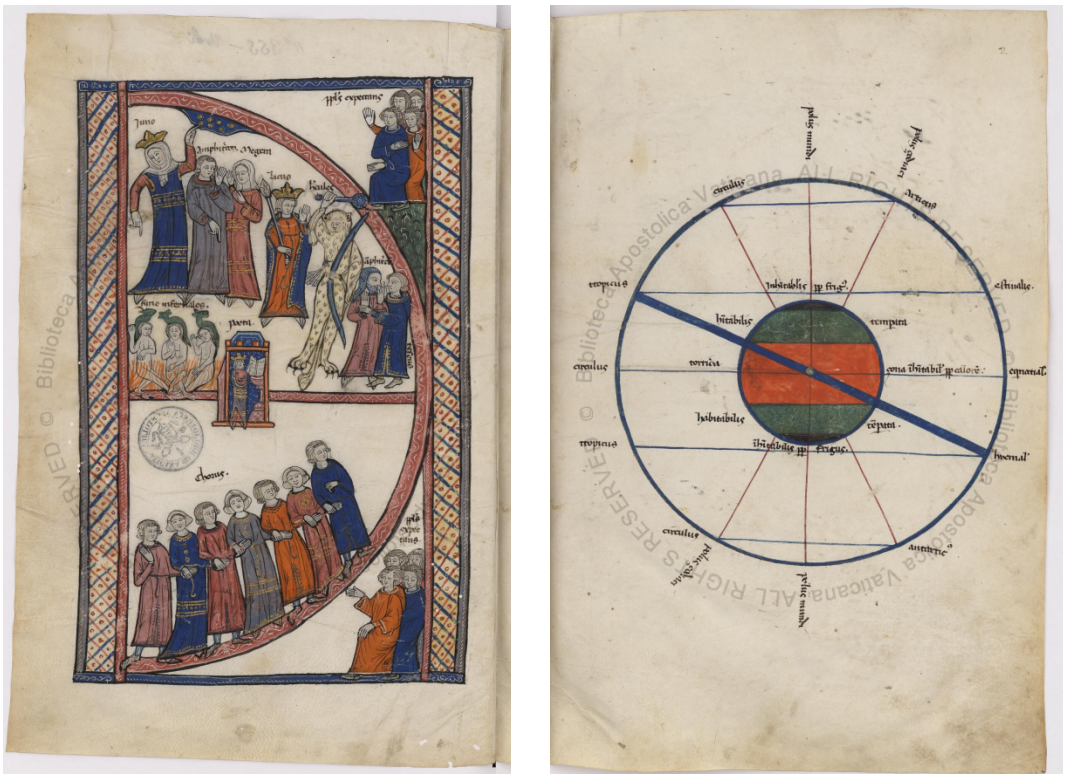


Figure 42: Commentary on the Tragedies of Seneca, illuminated by the *Queste* Master. Vatican City, BAV, MS Lat. Urbinate 355, folios 1^{v} and 2^{r}.

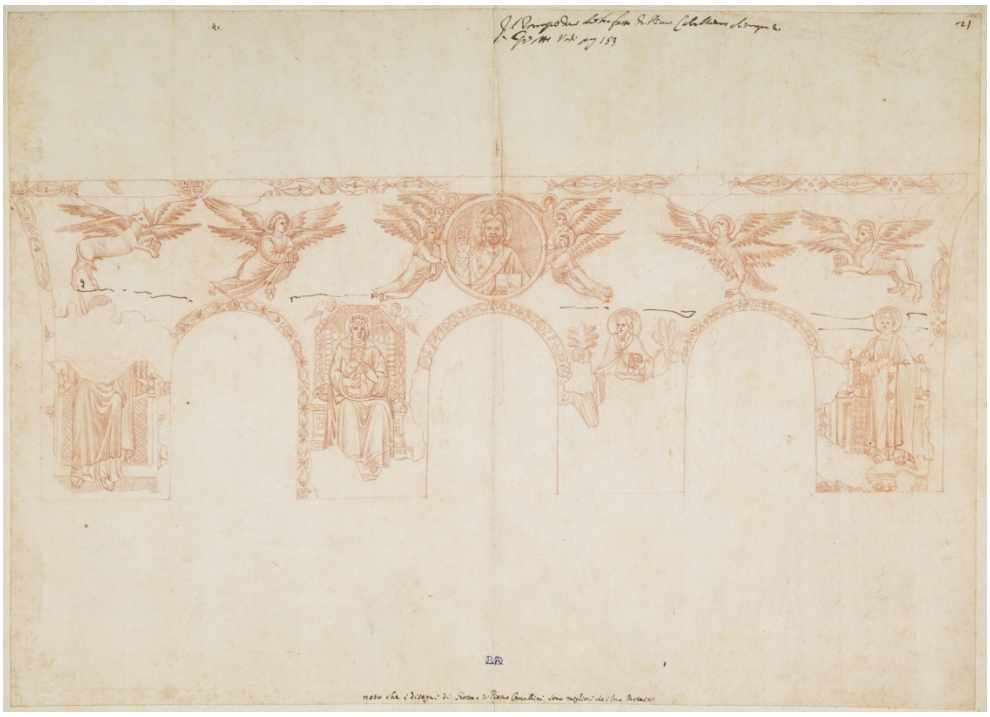


Figure 43: Drawing of facade mosaic of S Paolo fuori le mura, Rome (seventeenth century). Scotland, National Gallery, Inv. no. 1057

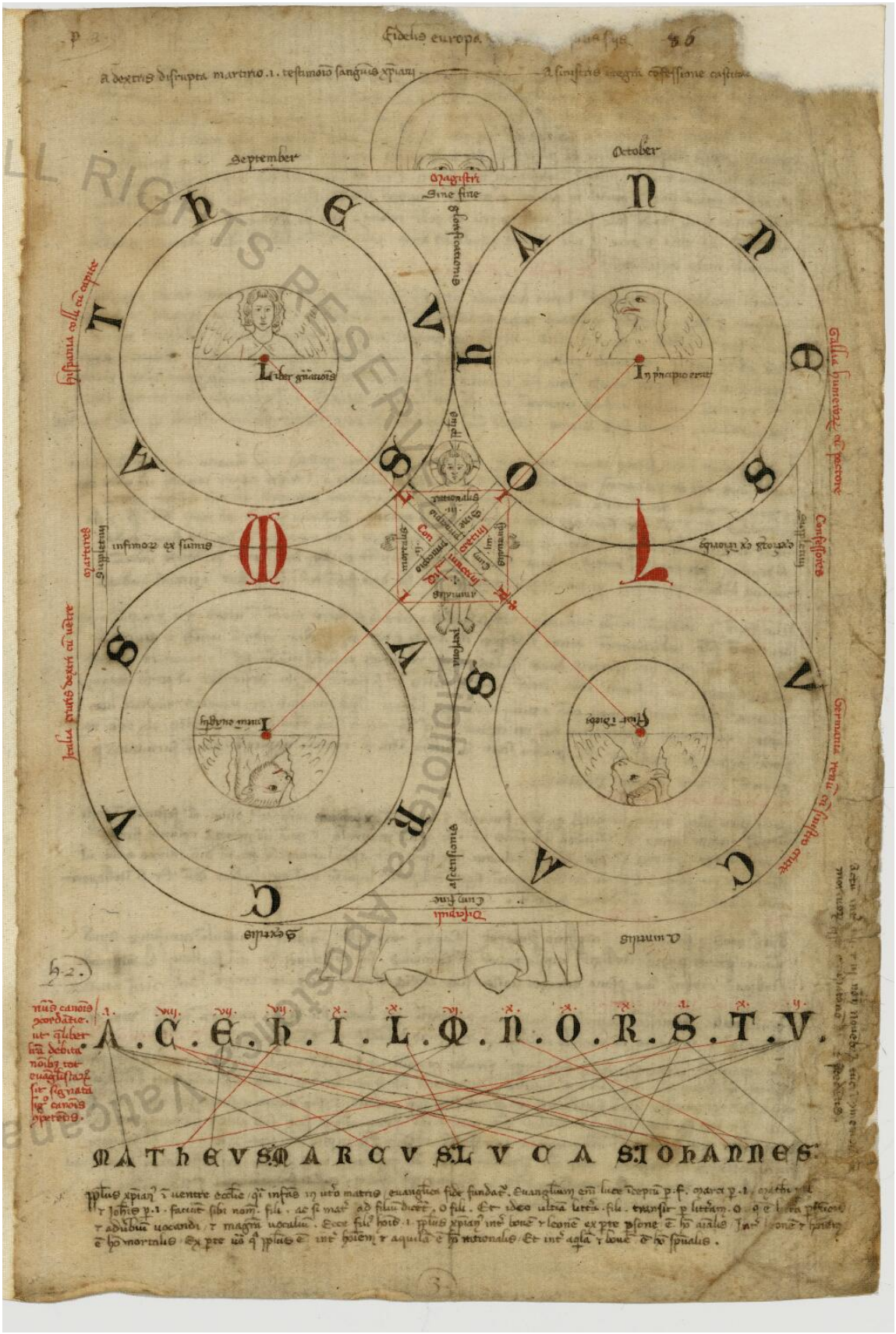


Figure 44: Wheels of the Gospels, Opicinus de Canistris. Vatican City, BAV, MS Vat. Lat. 6435, fol. 86^{r}

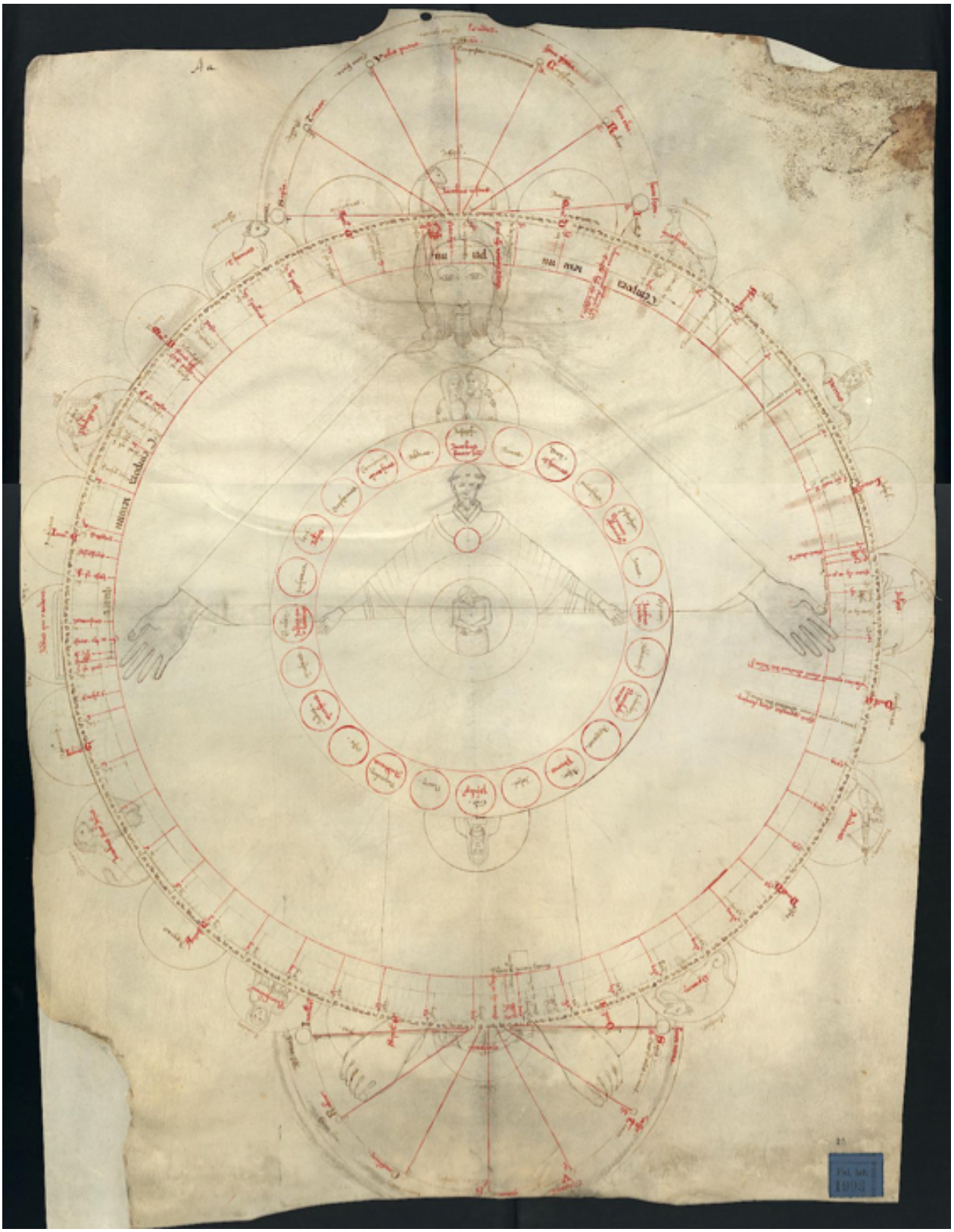


Figure 45: Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 25^{r}



Figure 45a: Detail of top magnification, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 25[r]

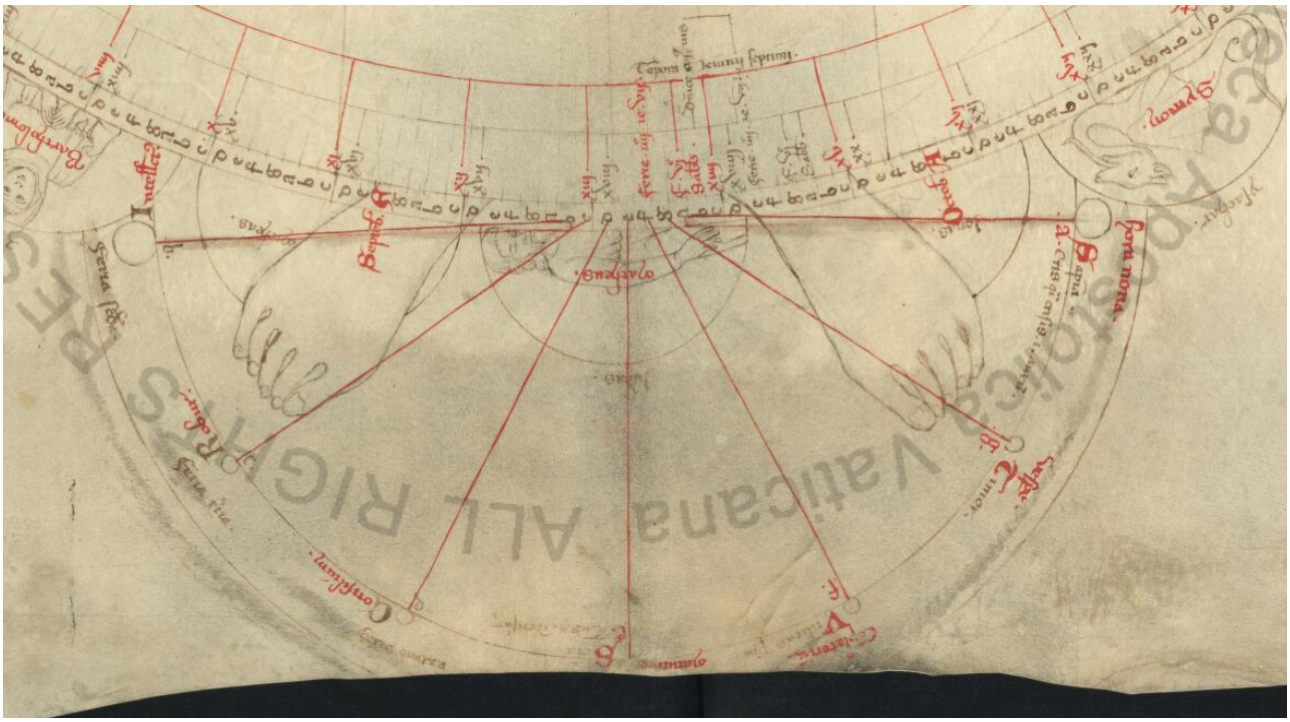


Figure 45b: Detail of lower magnification, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 25[r]

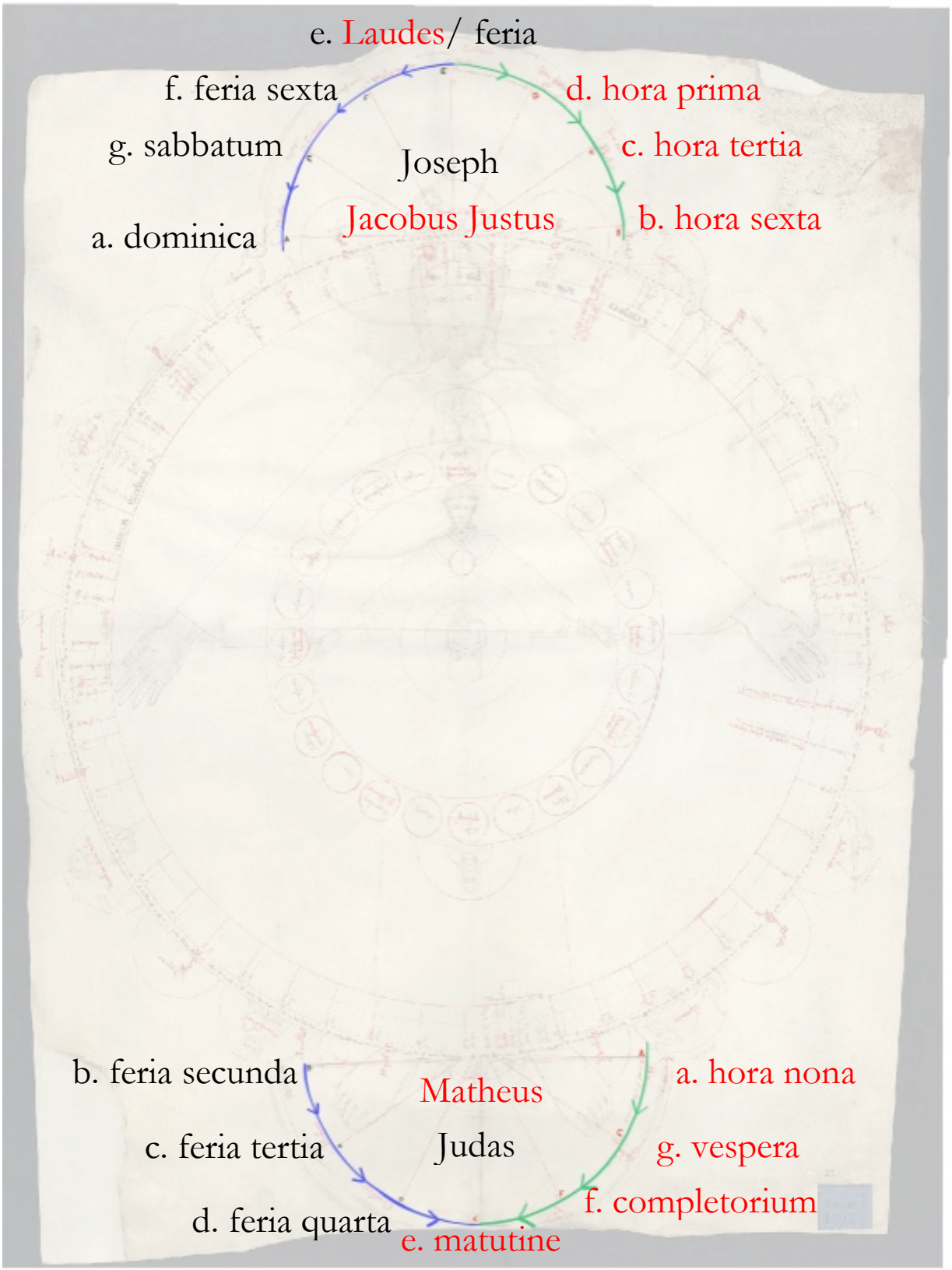


Fig. 45c: Diagram of the magnifications of figures 1a and 1b.
Blue shows the direction of the weekdays. Green shows the direction of the canonical hours.

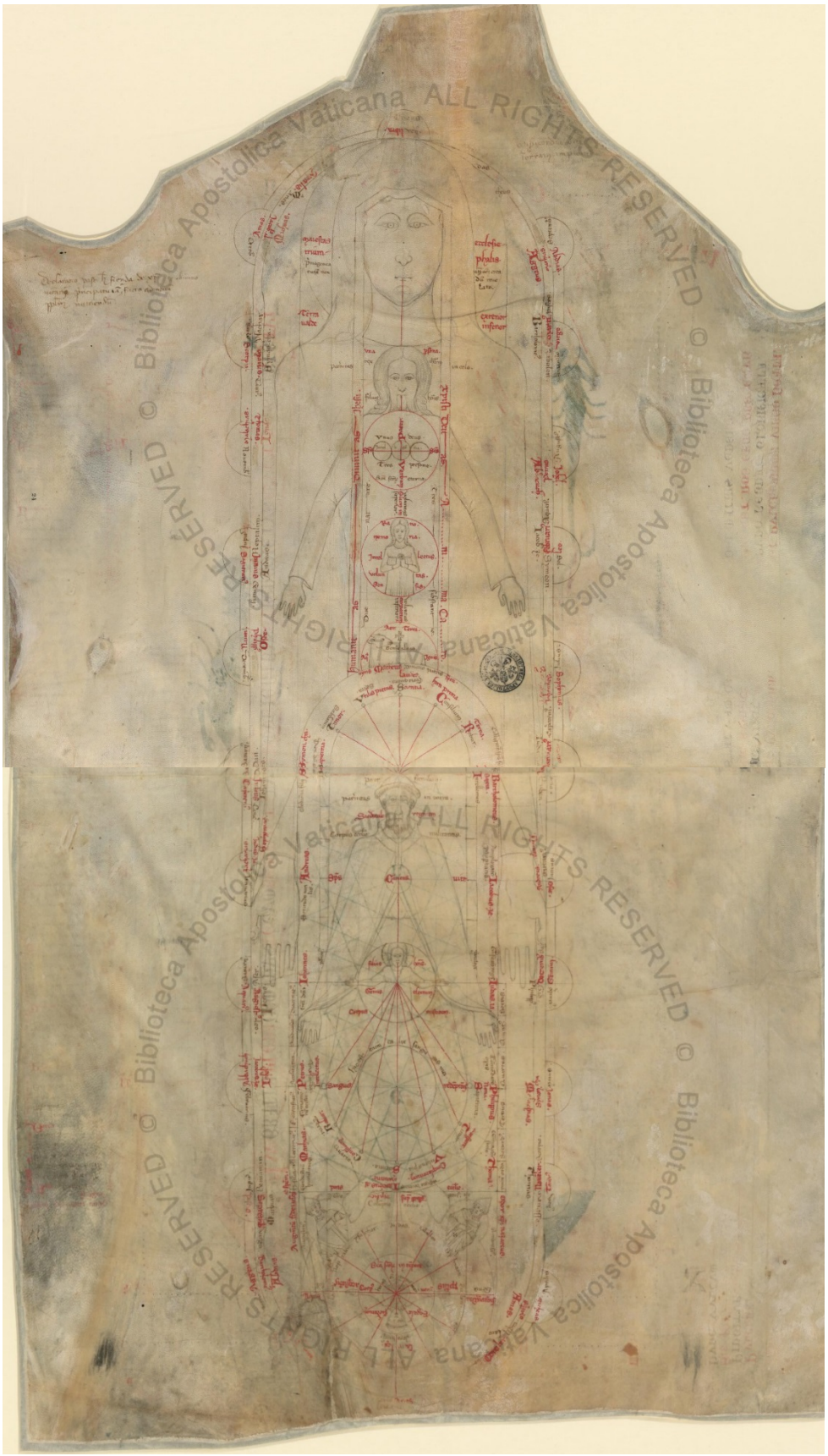

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Figure 46: Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 24^{v}

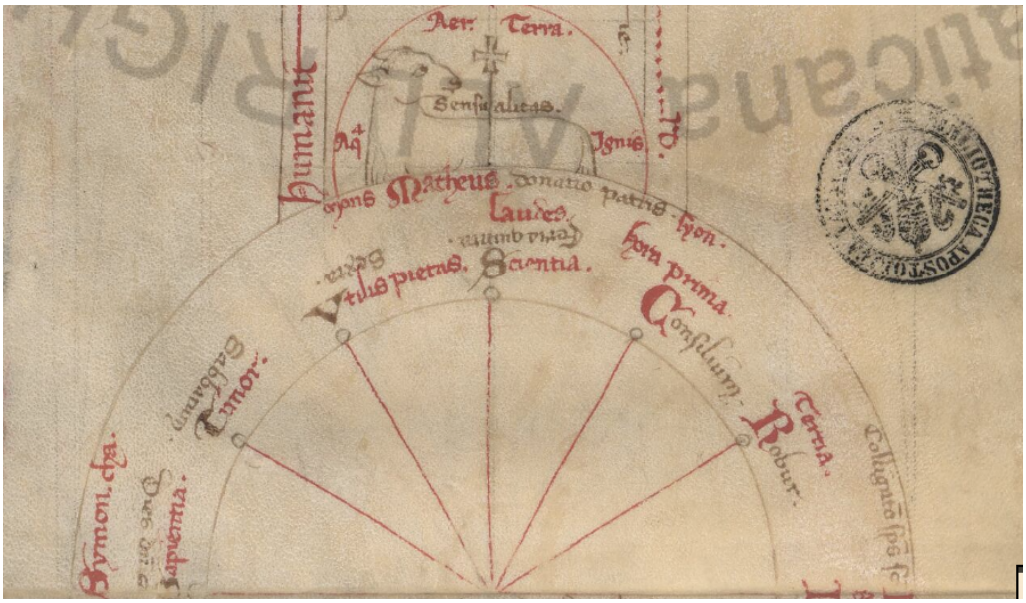


Figure 46a: Detail of top magnification, Opicinus de Canistris. Vatican City, BAV, Pal. Lat. 1993, fol. 24^{v}

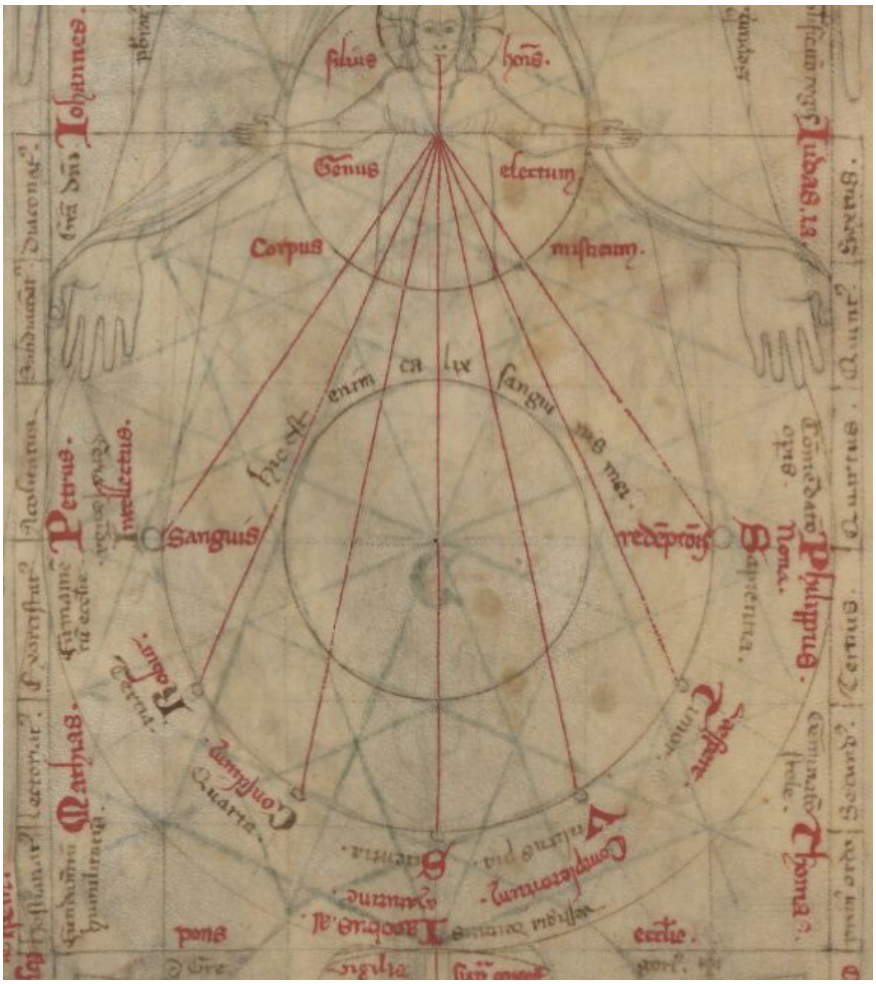


Figure 46b: Detail of lower magnification, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 24^{v}

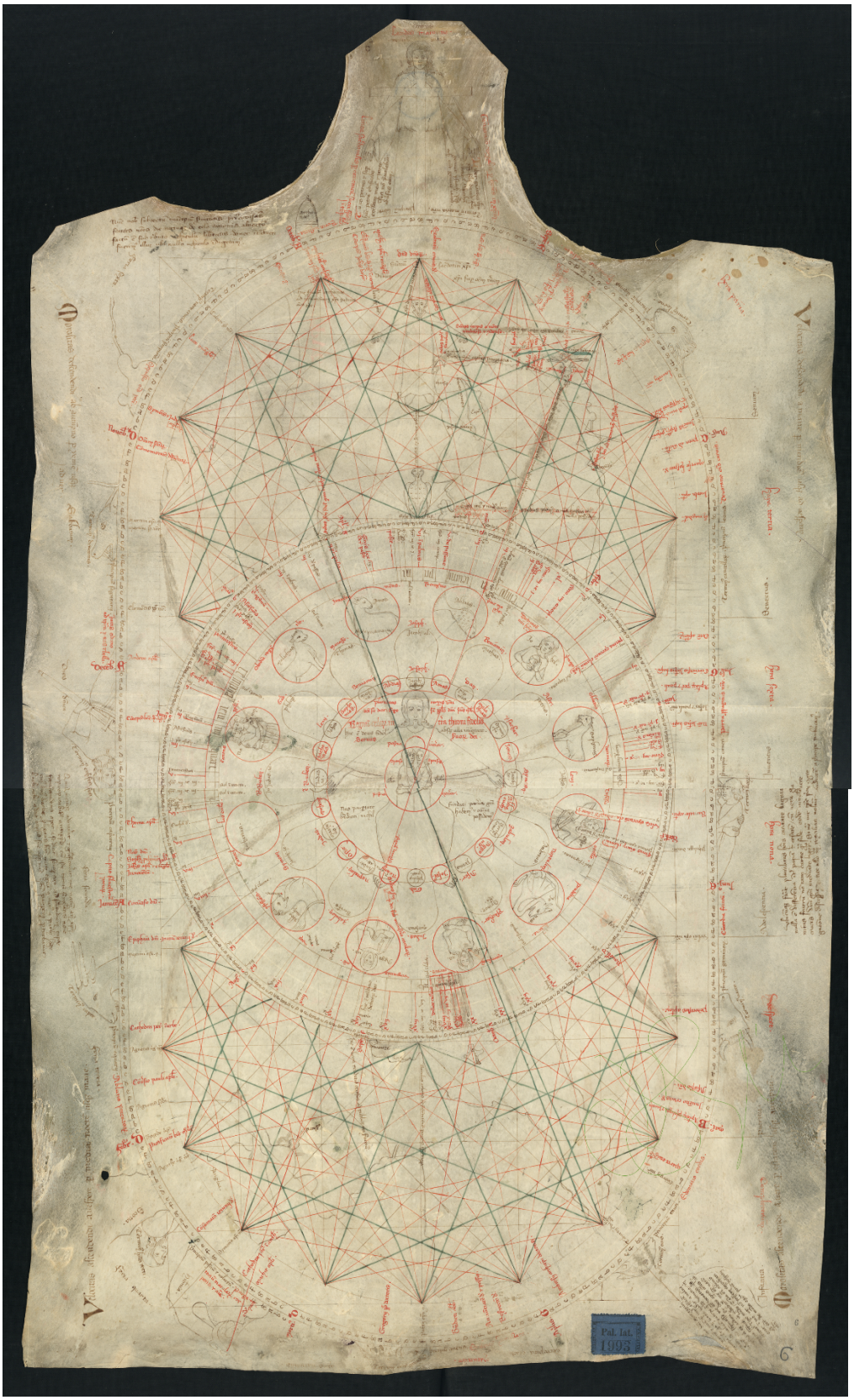


Figure 47: Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 6^{r}

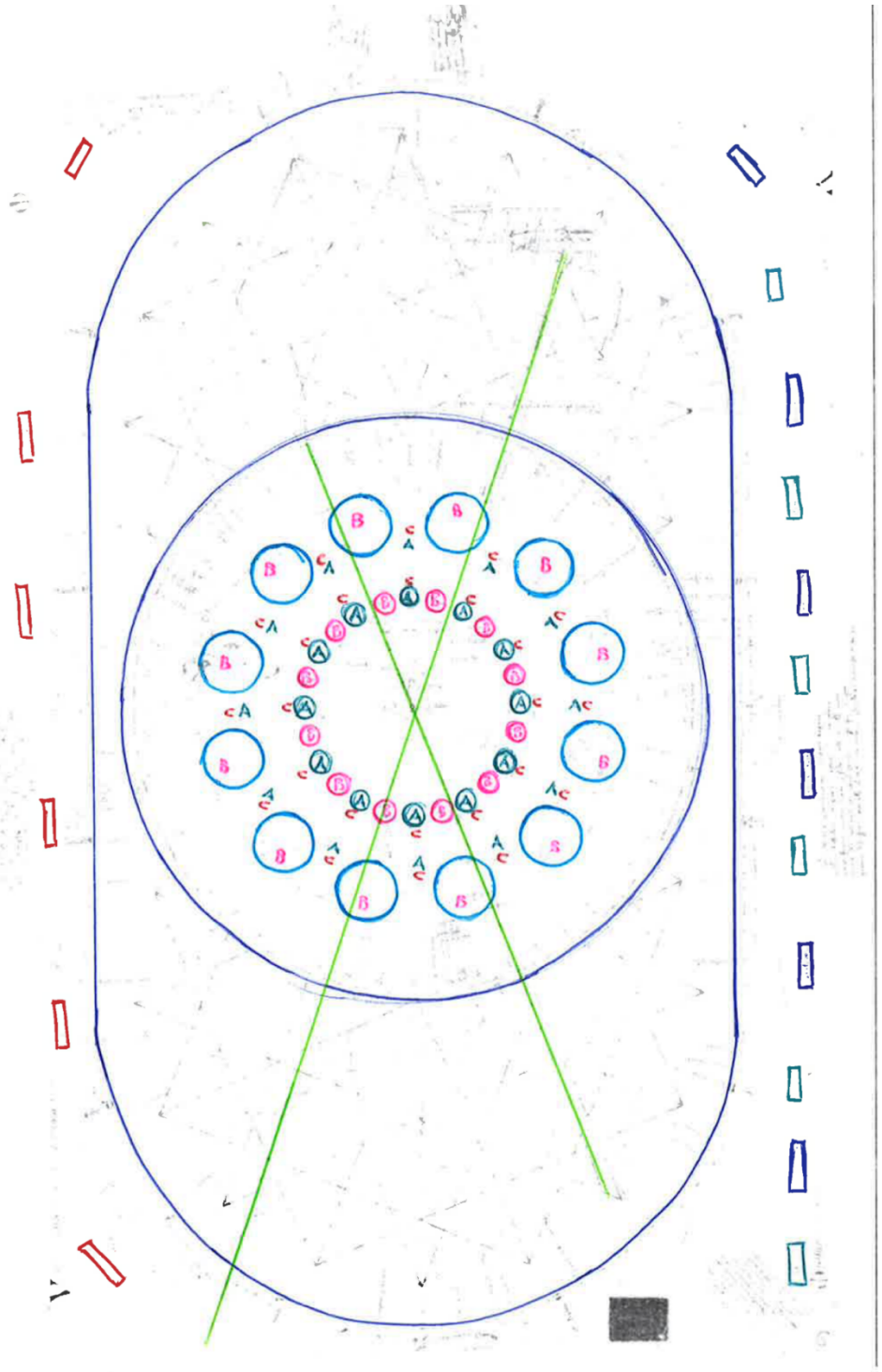


Figure 47a: Diagram of cycles of time in Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 6^{r}
Outside of oblong:
Red: days of the week
Blue: canonical hours
Green: ages of man

Inside Circle: A: names of the apostles; B: names of the minor prophets, C: names of the tribes of Israel

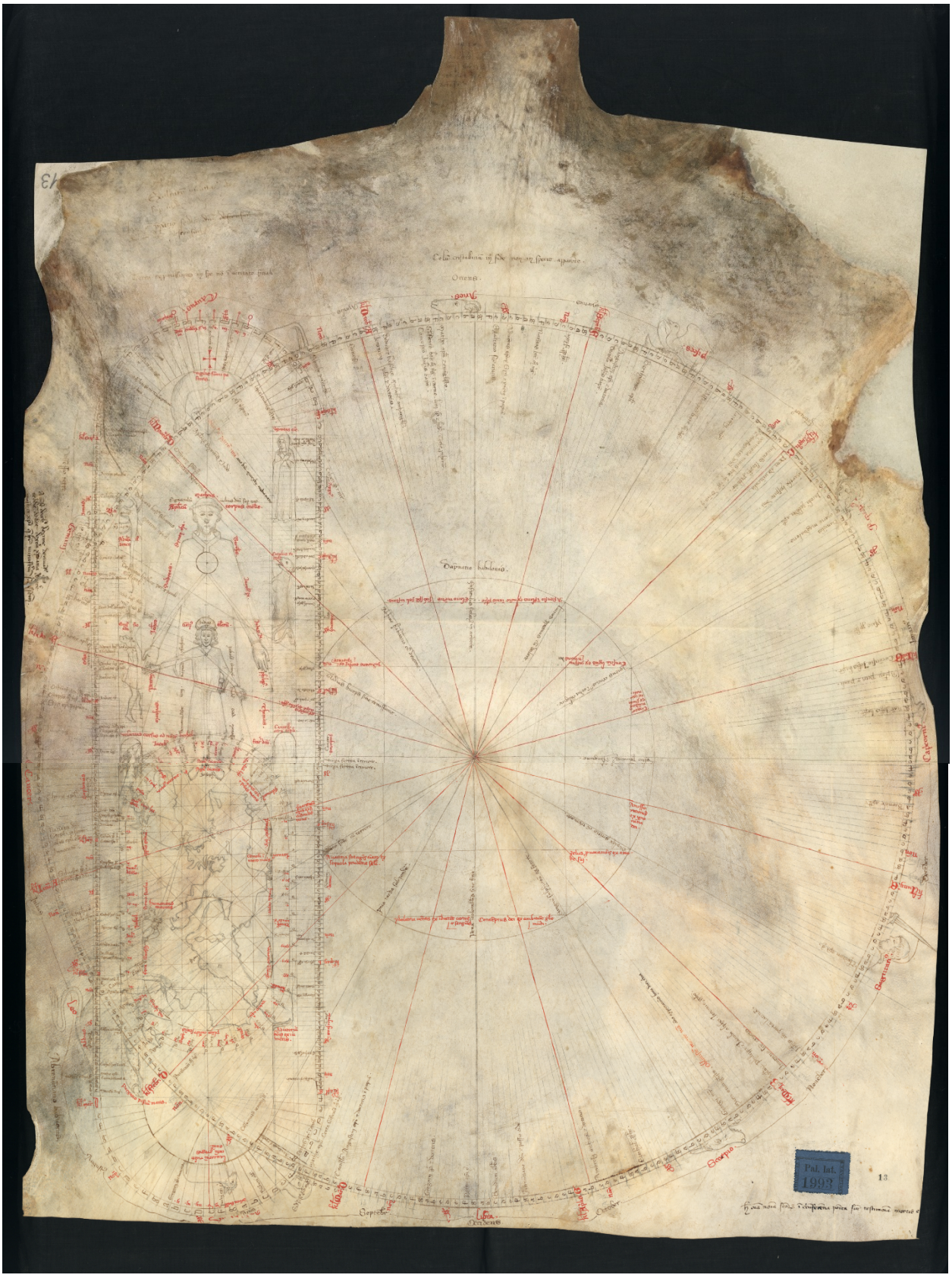


Figure 48: Opicinus de Canistris, Vatican City, BAV, MS Pal. Lat. 1993, fol. 13^{v}

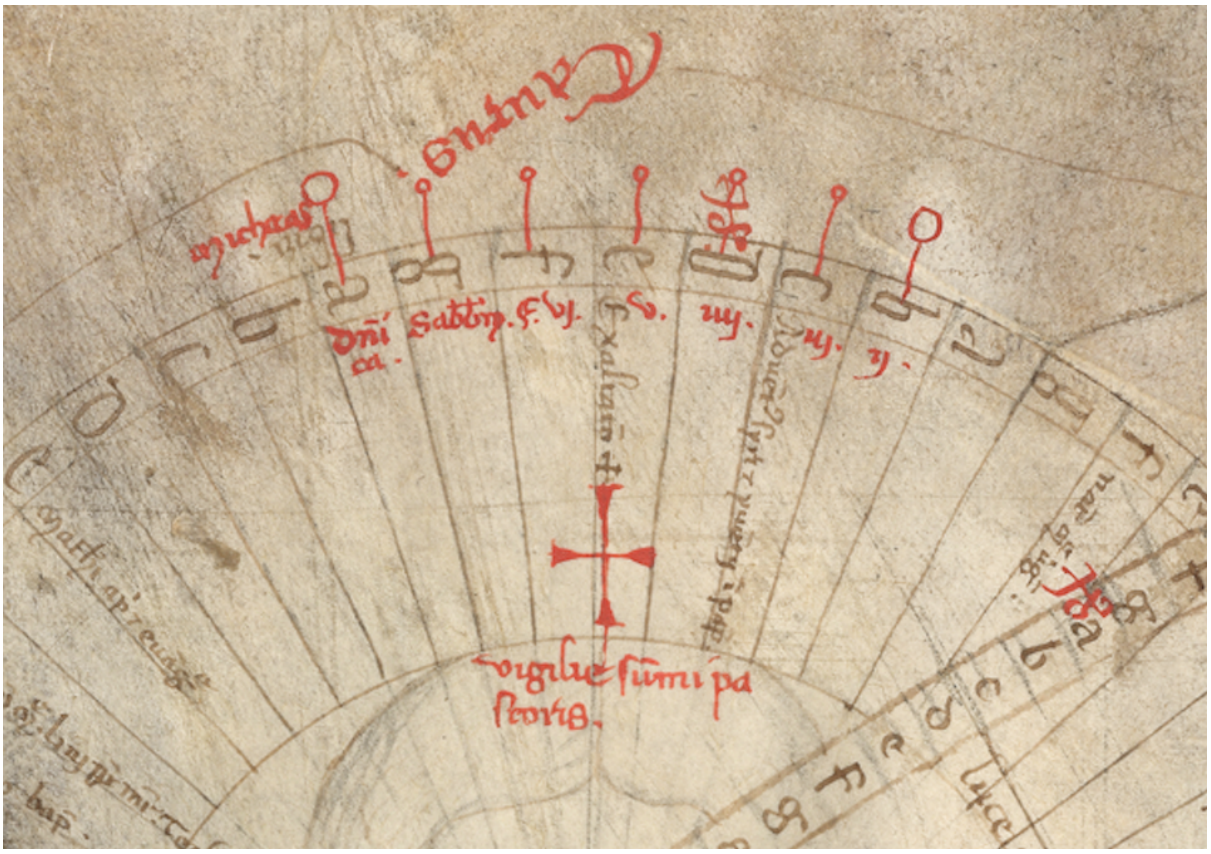
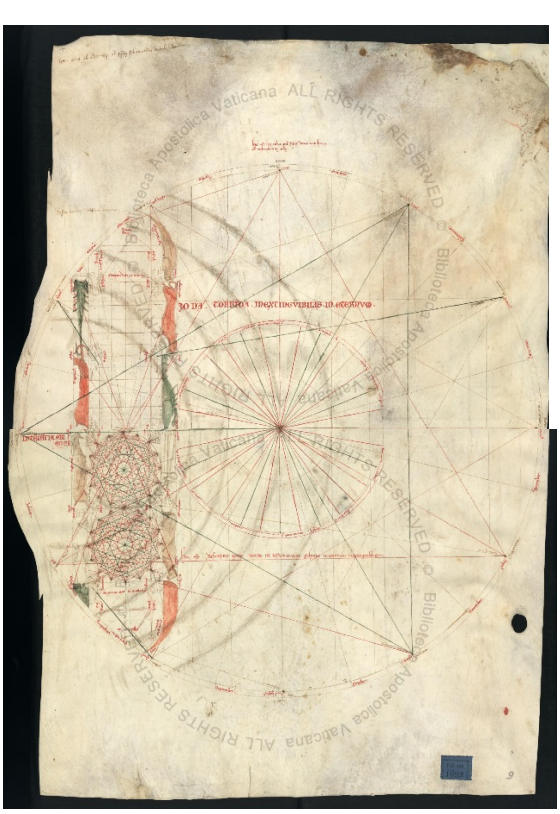


Figure 48a: Detail of top magnification, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 13^{v}



Figure 48b: Detail of lower magnification, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 13^{v}



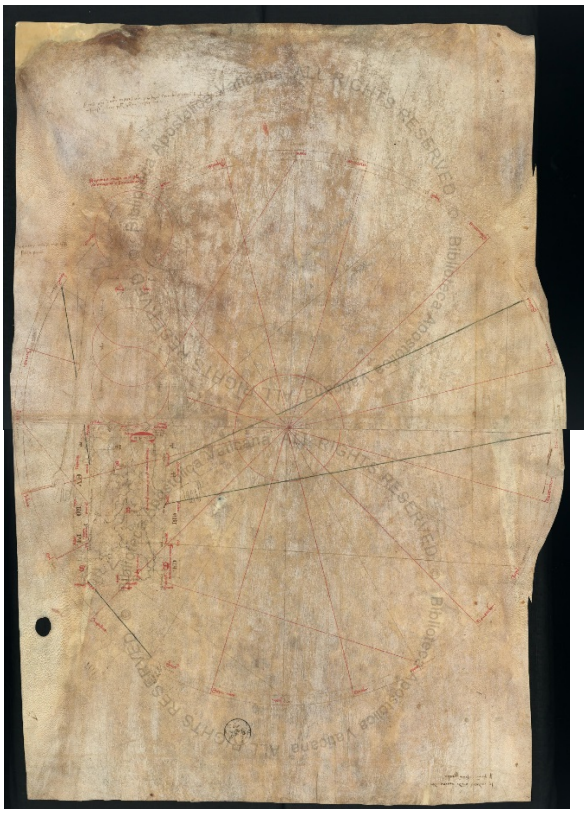


Figure 49: Opicinus de Canistris, Vatican City, BAV, MS Pal. Lat. 1993, fol. 9^{r}

Figure 50: Opicinus de Canistris, Vatican City, BAV, MS Pal. Lat. 1993, fol. 9^{v}



Figure 51: Opicinus de Canistris, Vatican City, BAV, MS Pal. Lat. 1993, fol. 17^{r}

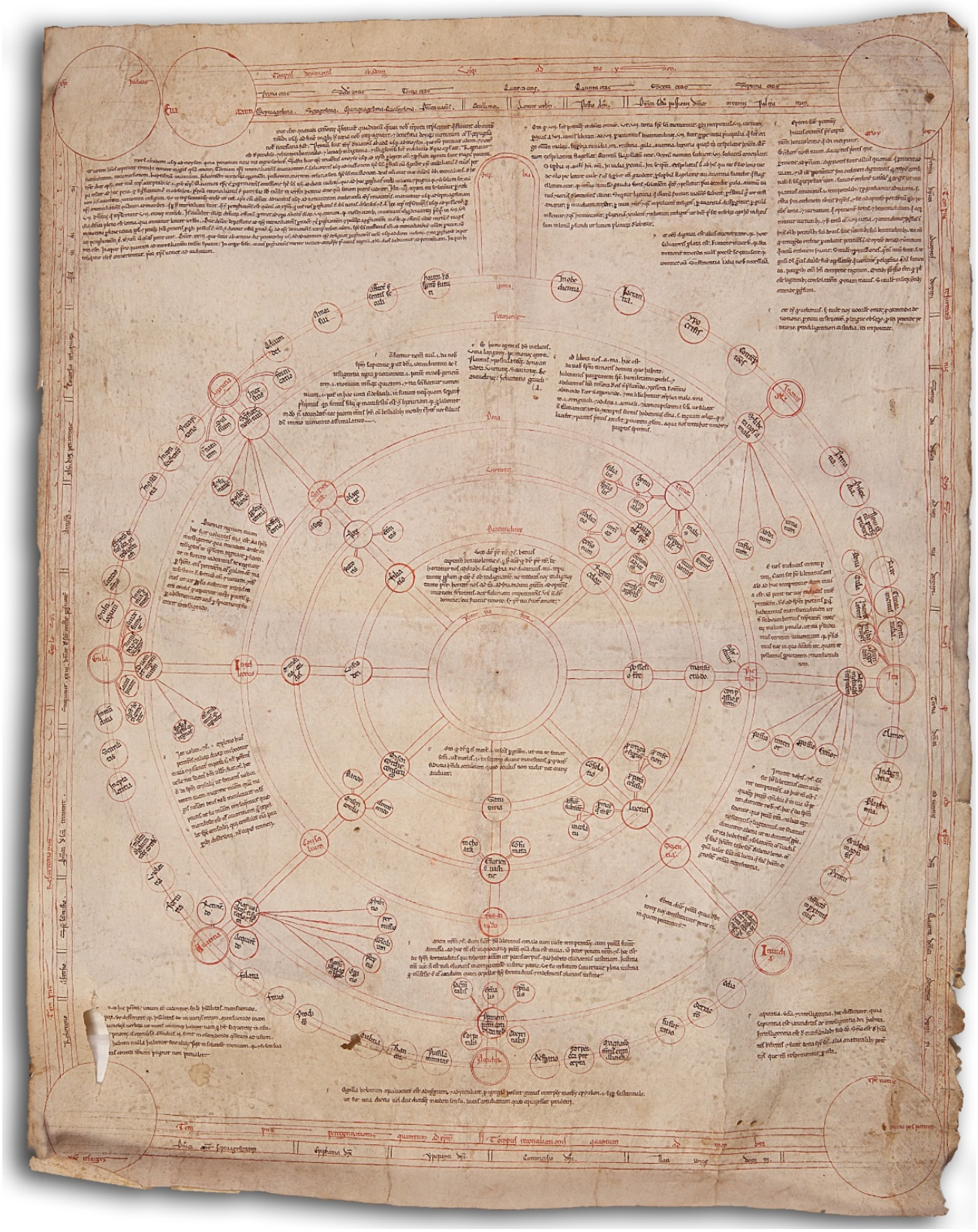


Figure 52: *Wheel of Sevens* (thirteenth century). Archivio Capitolare di Vercelli

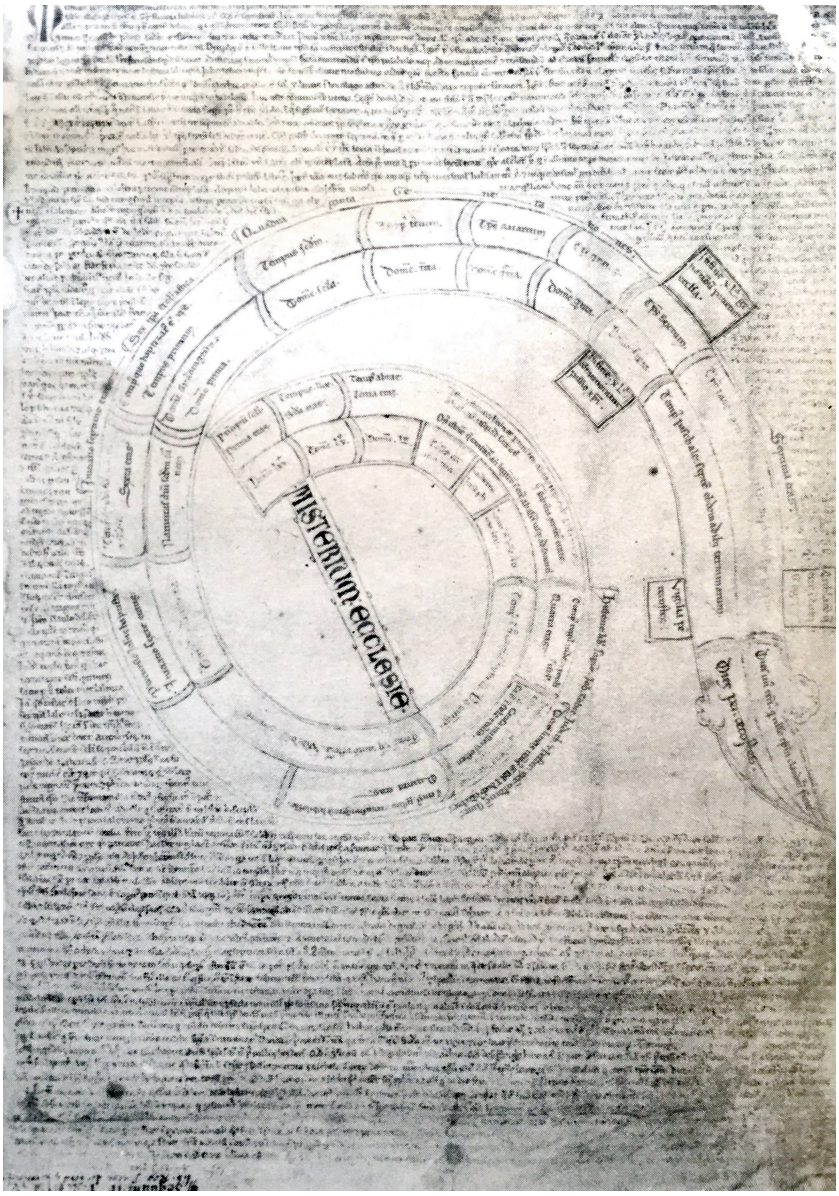


Figure 53: *Mysterium Ecclesiae*, *Liber figurarum* of Joachim of Fiore (early-thirteenth century, southern Italian). Oxford, Corpus Christi College MS 255A, fol. 17^{v}

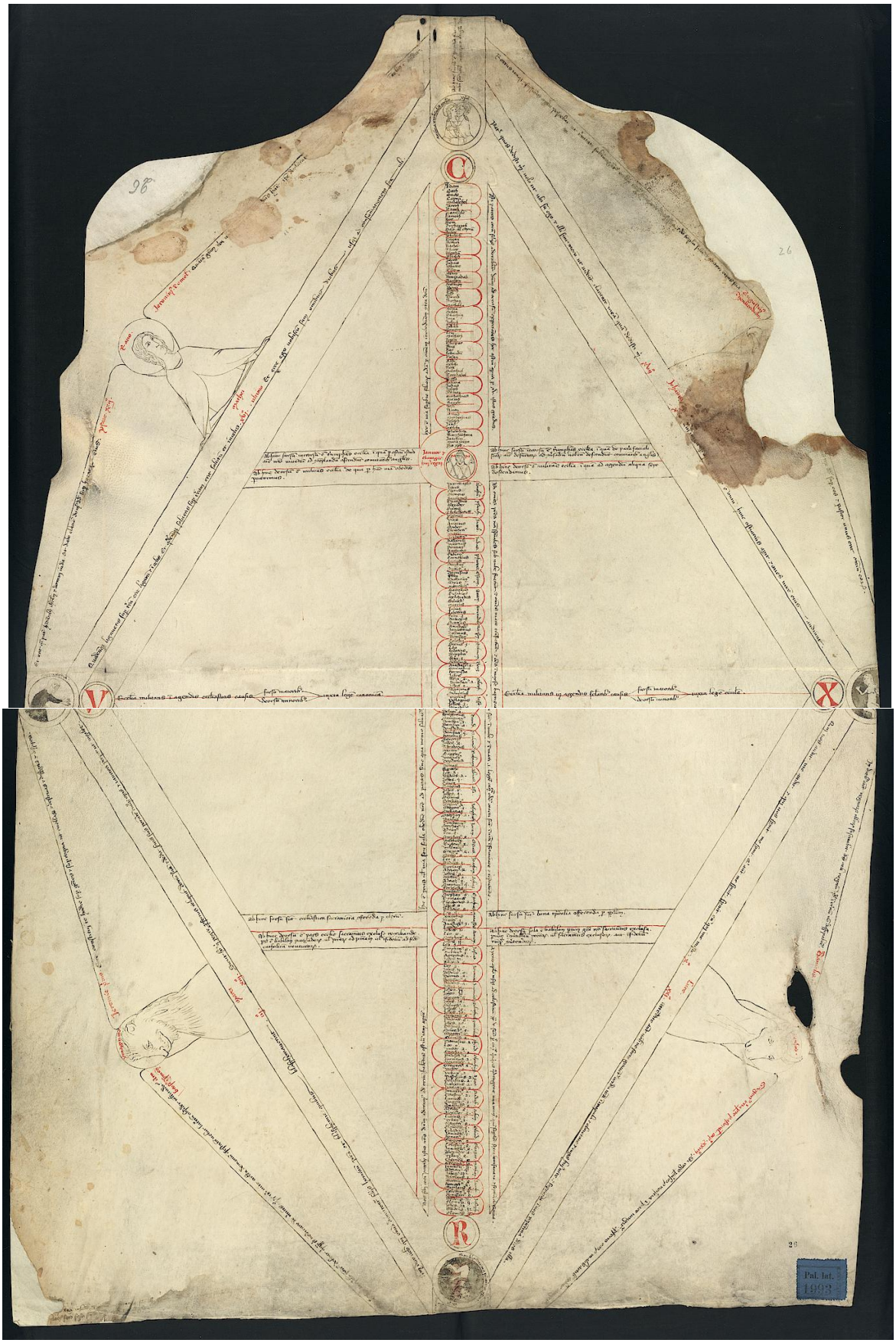


Figure 54: Opicinus de Canistris (1350), Vatican City, BAV, MS Pal. Lat. 1993, fol. 26^{r}

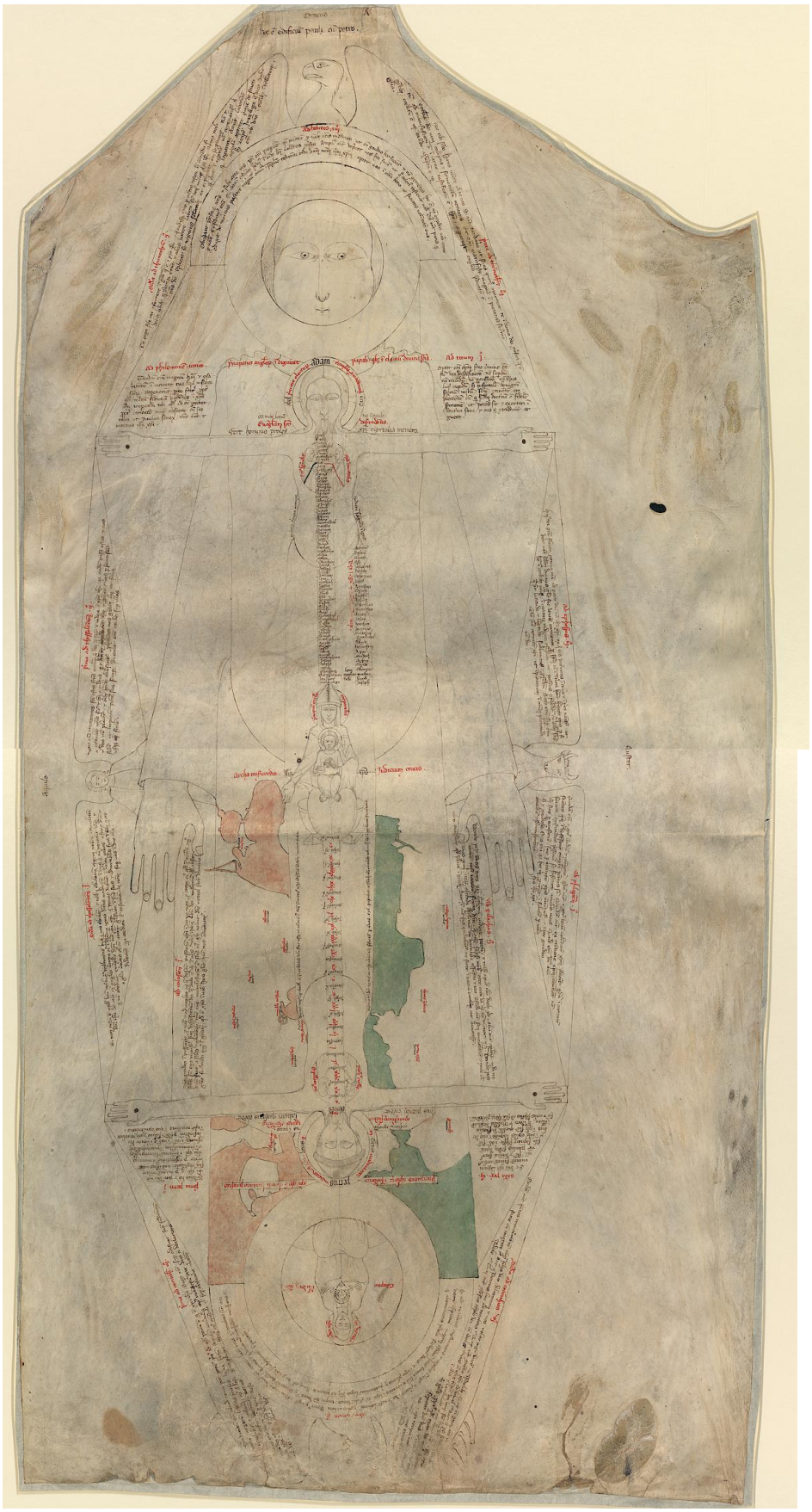


Figure 55: Opicinus de Canistris, Vatican City, BAV, MS Pal. Lat. 1993, fol. 10^{r}



Figure 56: Calendar of Astronomical clock, Prague town hall

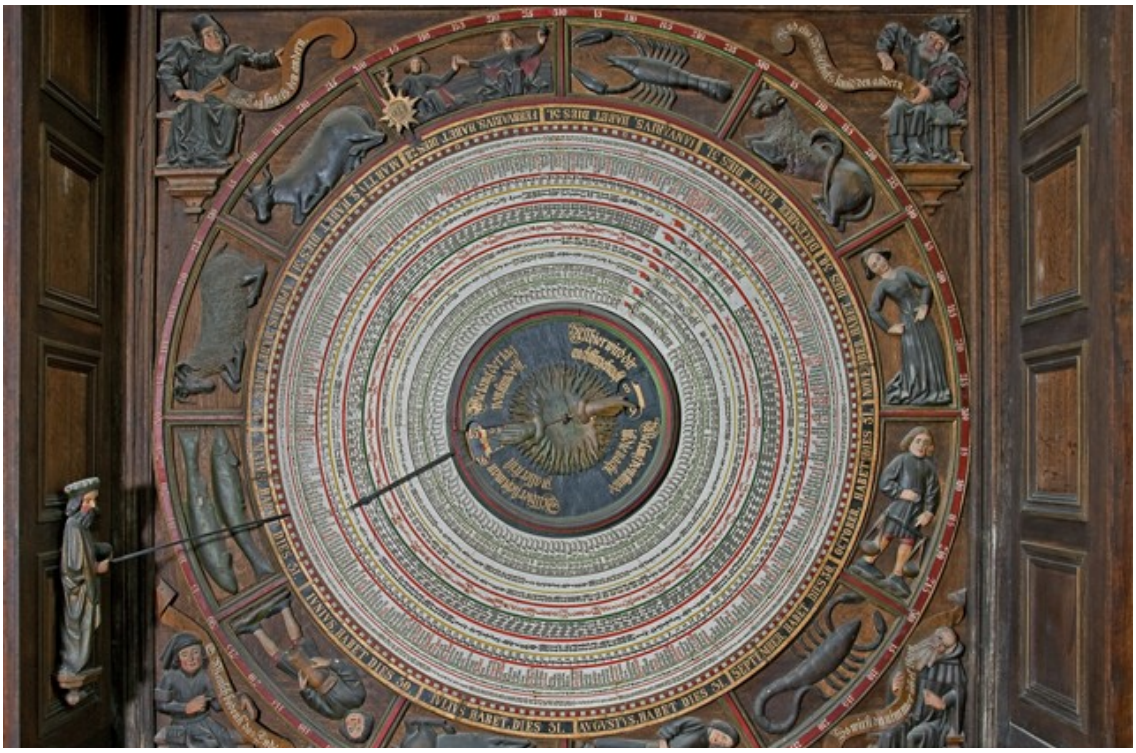


Figure 57: Calendar of Astronomical clock (1472 onwards), St Mary's Church, Rostock



Figure 58: Sphere of John Peckham, England (c. 1308-40). British Library, MS Arundel 83-II: *De Lisle Psalter*, fol. 123^{v}



Figure 59: *The Creation* wall painting by Piero di Puccio (1389-90). Pisa, Camposanto

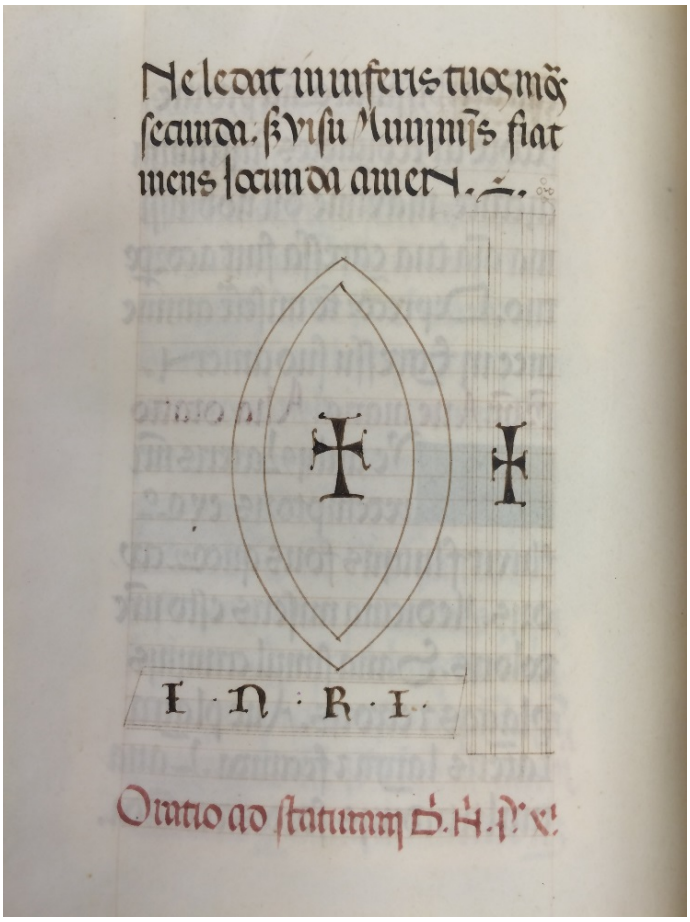


Figure 60: Diagram of the height of Christ, Book of Hours (French, fifteenth century). California, Huntington Library, HM 1104, fol. 214[v]





Figure 61a: Detail of upper Christ crucified, *Palatinus A*, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 14^{r}

Figure 61b: Detail of lower Christ crucified, *Palatinus A*, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 14^{r}



Figure 62: Detail of May, Calendar from farmer's almanac (English, fourteenth century). Oxford, Bodleian Library, MS Rawl. D. 939, Part II



Figure 63: *The Creation* wall painting, Giusto de'Menabuoi (1376-78). Padua Duomo, Baptistery

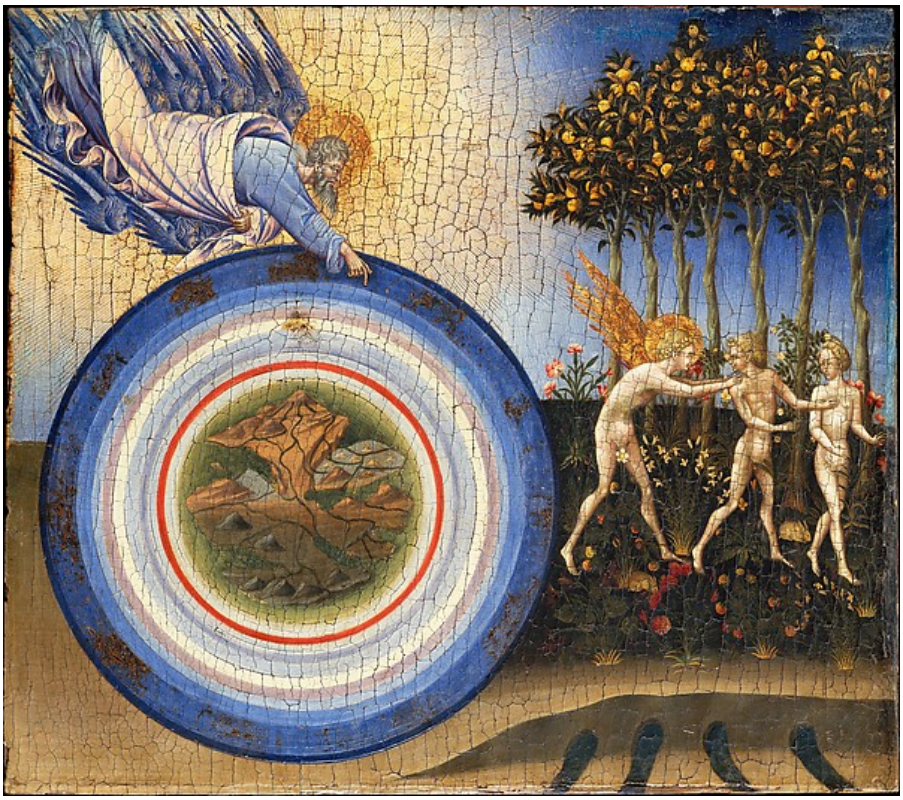


Figure 64: *The Creation of the World and the Expulsion from Paradise*, Giovanni di Paolo (1445). New York, Metropolitan Museum of Art, Inv. No. 1975.1.31

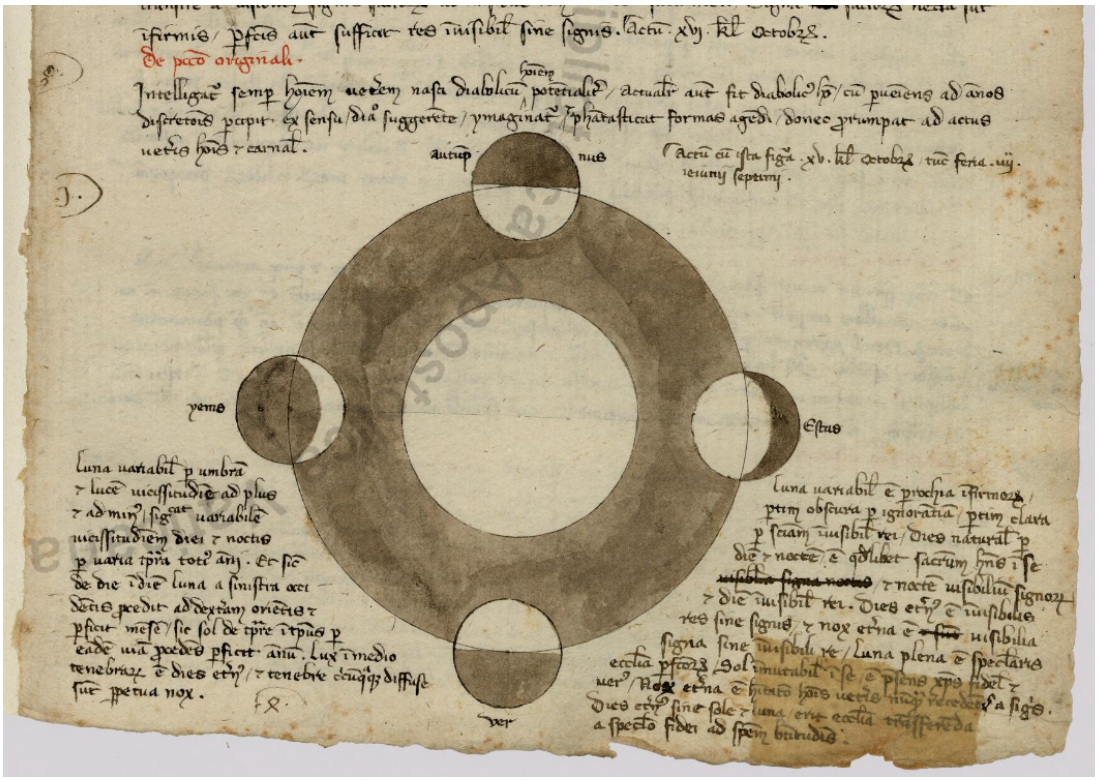


Figure 65: Lunar diagram, Opicinus de Canistris. Vatican City, BAV, MS Vat. Lat. 6435, fol. 51[r]

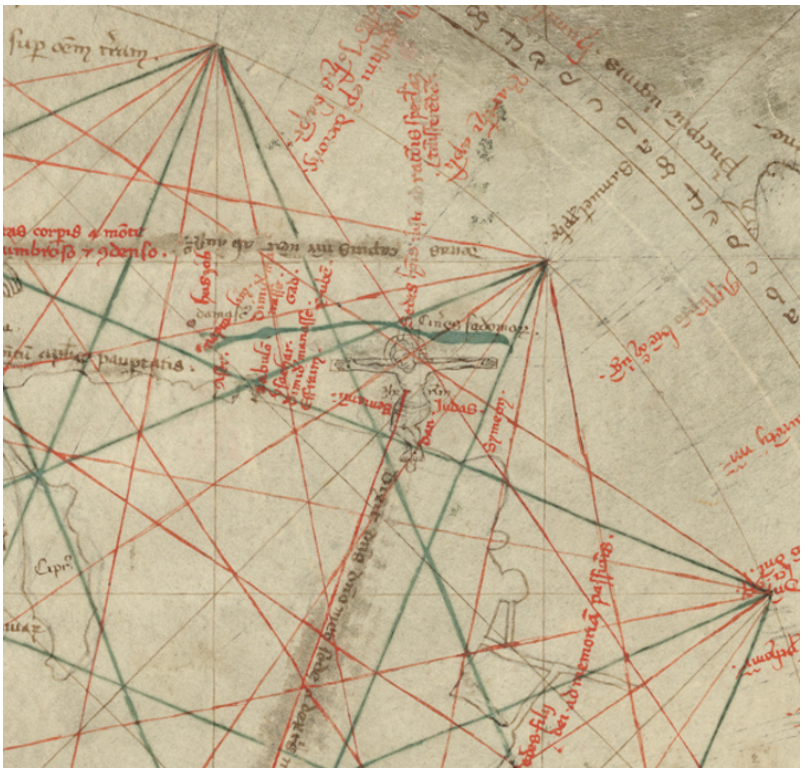


Figure 66: Detail of Christ crucified over Jerusalem, Opicinus de Canistris. Vatican City, BAV, MS Pal. Lat. 1993, fol. 6^{r}



Figure 67: Side wound of Christ, *Image du monde*, Gautier of Metz (c. 1320). BnF, MS Fr. 574, fol. 140^{v}



Figure 68: Side wound of Christ (before 1349). New York, Metropolitan Museum of Art, The Cloisters Collection, MS 68.86, fol. 331[r]

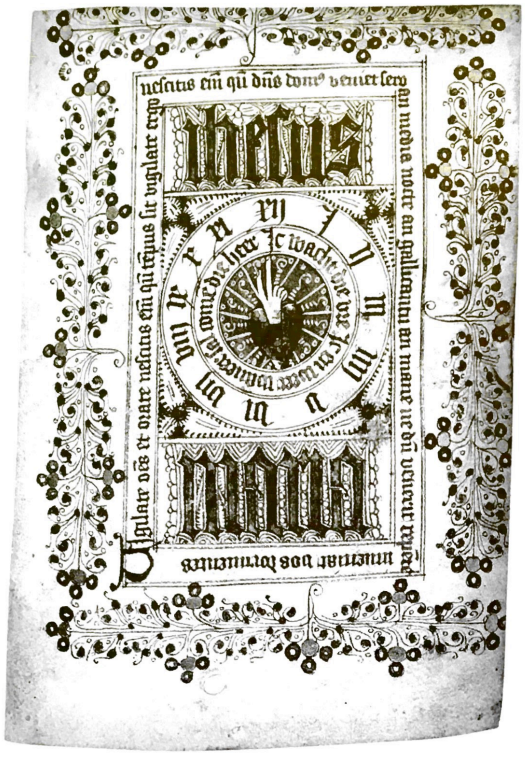


Figure 69: *Ihesus-Maria* clock face (Delft, c. 1460-70) pasted into South Netherlandish Book of Hours (c. 1440). France, Private collection, fol. 13[r]