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From Computus Material to Preacher's Toolbox

Alexandre Tur

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ALFONSINE ASTRONOMY

ALFONSINE ASTRONOMY

STUDIES AND SOURCES

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The Written Record

Edited by

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JOSÉ CHABÁS

BREPOLS

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From Computus Material to Preacher's Toolbox: Manufacturing a Bat-Book Almanac in the Fifteenth Century

Introduction

In the entire collection of 40 000 medieval manuscripts at the Bibliothèque nationale de France, only three qualify as 'bat books' or, as we used to say before Johann Grumbert's 2016 study on this particular format, books *en forme de cliquette de ladre* (in the form of a leper's clapper), or *en forme de crécelle de pestiféré* (in the form of a pestiferous rattle).¹ All three of them are rather recent acquisitions; the last two, BnF NAL 375 and NAL 482 were bought in the nineteenth century by librarians out of curiosity for their odd format.² Both are fourteenth-century almanacs adapted from Peter of Dacia's *Kalendarium*, a widespread cyclic calendar used to obtain reliable syzygy times for liturgical purposes, in a folded form that proved to be, if rare (or at least rarely preserved), not exceptional at the time. Because of their specific format and delicacy, both have been preserved in the Department of Manuscripts' *Réserve* since their acquisition, although they are not the most precious items in the library.

The third BnF bat book entered the library at an earlier time, and, probably because it was part of a large donated collection, it does not seem to have attracted much attention upon its arrival. Manuscript Latin 7478 had been acquired by the bibliophile Roger of

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- 1 Johan Peter Gumbert, *Bat Books: A Catalogue of Folded Manuscripts Containing Almanacs or Other Texts* (Turnhout: Brepols, 2016).
- 2 Léopold Delisle, *Manuscrits latins et français ajoutés aux fonds des nouvelles acquisitions pendant les années 1875–1891* (Paris: H. Champion, 1891), I, pp. 91–92. The acquisition of these bat books took place in a context of scientific interest for portable books (even those not considered as bat books today, such as the pocket breviary, BnF Latin 10479. See also, Hercule Géraud, 'Calendrier perpétuel portatif dressé l'an 1381', *Bibliothèque de l'École des chartes*, 2 (1841), 272–80; 'Calendrier portatif du XIV^e siècle', *Bibliothèque de l'École des chartes*, 44 (1883), 569; 'Calendrier portatif du XV^e siècle', *Bibliothèque de l'École des chartes*, 45 (1884), 136–37.

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Alfonsine Astronomy: The Written Record, ed. by Richard L. KREMER, Matthieu HUSSON, José CHABÁS, Turnhout, 2022 (*Alfonsine Astronomy: Studies and Sources*, 1), pp. 143–198

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Gaignières (1644–1715), before he gifted his manuscript collection to King Louis XIV in 1711. After entering the royal collection, the manuscript was rebound in what was at the time the customary ‘Royal Morocco binding’ for the King’s manuscripts.³ While much of the codicological information on how it was composed as a bat book was lost in the process, it is striking that it was done quite competently and not in a way that would have entirely obliterated its bat book past: the folding remains, as well as the order of the leaves (for the most part). The procedure also strengthened the manuscript, leaving it less fragile than, for instance, NAL 375, which is in its original binding. Included in the scientific section of the royal library, MS Latin 7478 remained mostly unstudied, except for a few exhibitions or presentations of ‘unusual manuscripts’.⁴

Looking more closely at its organization and content, however, these appear very uncommon for a bat-book almanac. This paper aims to reclassify it more precisely within the contexts of late medieval bat books and of fifteenth-century ‘enhanced calendars’. With this rare case of a non-English Alfonsine bat book almanac, we endeavour to submit a few hypotheses on the role of such an object in the Alfonsine framework and late-medieval culture.

1. A bat book or folded almanac?

1.1. From content to form: a codicological notion

The concept of a bat book is relatively recent, as it was forged by late Leiden University codicology professor, Johan Peter Gumbert, in his 2016 published catalogue of folded manuscripts.⁵

In Gumbert’s sense, a bat book is a codicological type of manuscript, alternative to *codex* or *rotulus*. That means that a bat book is built in a manner entirely alien to that which we are accustomed with codex manuscripts. A bat book is made of individual folded leaves sewn together on a marginal tab, which means that there are no quires as there are in codices,

3 It is described as unbound in the 1711 inventory of the Gaignières collection (‘Ancien almanach avec des cartes sur velin, in-12° non relié’, BnF Clairambault 1032, #73, f. 347^r). On the 1717 register of the entry of the collection in the Royal Library, an early-nineteenth-century librarian added a #73/2 item as ‘Anonymi tabulae variae ad cyclum solarem et lunarem accomodatae, accedunt canones, saec. XV°’, with the actual shelfmark (attributed 1744), ‘[Latin] 7478’ (BnF NAF 5738, p. 10). As both descriptions match the object of this paper, and there is no other manuscript from the Gaignières collection matching #73[/1], it is safe to assume, as hypothesized by Gumbert, that both lines refer to the same Latin 7478. On this subject, see also the COLLECTA database on the Gaignières collection and its record for item #73: <https://www.collecta.fr/permalien/COL-OUV-00078> [Accessed 28 July 2020].

4 Although it has been identified as a bat book for some time, Latin 7478 remains less highlighted than the other two, and less altered. It was, for instance, mentioned in ‘Le Livre’ exhibition as a relation to the displayed NAL 375 (*Le Livre* [May 17–Oct. 31, 1972], ed. by Roger Pierrot and Marcel Thomas [Paris: Bibliothèque nationale, 1972], p. 74, #222). See also Hermann Degering, ‘Der Bucheinband: Ein calendarium pugillare mit Computus aus dem Jahre 1294’, in *Buch und Bucheinband, Aufsätze und graphische Blätter zum 60. Geburtstag von Hans Loubier*, ed. by Max Joseph Husung (Leipzig: Hiersemann, 1923), pp. 79–88, mostly pp. 81–83 and pl. 7. Latin 7478 is mentioned in *Mappemondes AD 1200–1500: Catalogue préparé par la Commission des cartes anciennes de l’Union géographique internationale*, ed. by Marcel Destombes (Amsterdam: N. Israel, 1964), p. 61 nb. 23 for the map of the world displayed in f. 17D, maybe a later adjunct (see below).

5 Gumbert, *Bat Books*.



Figure 1. Bat book; *en forme de crécelle de pestiféré* or *en forme de cliquette de ladre* (shaped like a leper's clapper or rattle).

(a) A pestiferous rattle. Paris, BnF, Arsenal, MS-5080, f. 373^r.

(b) A leper's clapper. Paris, BnF, Français 9140, f. 151^v.

(c) Bat book. Paris, BnF, NAL 482, tail edge. All reproduced with permission of the BnF.

and these leaves are to be unfolded to be read, from the outer edge to the stub, sometimes with several compartments for each step of the unfolding process.

While Gumbert was not the first to notice such books (there have been regular mentions since the nineteenth century, and in the case of English bat book almanacs, we have Hilary Carey's 2003 and 2004 illuminating papers), he is the first to give such a strong physical definition that goes back to the core of the book and is disconnected from the content, which enables a better typological view.⁶

Since the release of Gumbert's catalogue, even the name, bat book, has been widely adopted, in part because of the appealing metaphor, 'For myself I have gradually grown accustomed to calling them "bat books", because when in rest they hang upside-down and all folded up, but when action is required they lift up their heads and spread their wings wide', but also because previous English denominations were not really satisfactory.⁷ Even 'folded book' or 'folded manuscript' can be misleading, as a traditional codex can obviously contain folded leaves without being a bat book. *A fortiori*, 'folded almanac' confuses form and content, weakening the coherence of the notion.

The French denominations mentioned above (books shaped like a leper's clapper or rattle) are somewhat more interesting, because they relate to the appearance given by the

6 Hilary M. Carey, 'What is the Folded Almanac? The Form and Function of a Key Manuscript Source for Astro-medical Practice in Later Medieval England', *Social History of Medicine*, 16 (2003), 481–509; Hilary M. Carey, 'Astrological Medicine and the Medieval English Folded Almanac', *Social History of Medicine*, 17 (2004), 345–63. See also the nineteenth-century references mentioned above, and, more recently, André Vernet, 'Le Calendrier portatif de Mamert Fichet (1440)', *Bulletin de la Société Nationale des Antiquaires de France*, 1959 (1961), 243–44; Monique-Cécile Garand, 'Livres de poche médiévaux à Dijon et à Rome', *Scriptorium*, 25 (1971), 18–24; Chelsea Silva, 'Opening the Medieval Folding Almanac', *Exemplaria*, 30 (2018), 49–65.

7 Gumbert, *Bat Books*, p. 19.

main codicological characteristic, the tab sewing, that may evoke a clapper or a rattle, and mostly because, as Gumbert points out, the expression is found in the 1472 catalogue of the Clairvaux library, which seems to prove that it was already used with that meaning in the fifteenth century.⁸ For twenty-first-century readers, however, we must admit (and appreciate) that clappers and rattles are not as evocative.

1.2. *Bat books in the late Middle Ages*

In his catalogue, Gumbert identifies sixty-three bat book manuscripts, either currently preserved in public libraries, or that were attested precisely enough in the last century. He gathers them in seven groups, depending on their date and content, which gives an interesting picture of the history of this type of book.⁹

Bat books seem to have been invented in the middle of the thirteenth century as a solution to, as Gumbert puts it, ‘make something that is small outside but large inside.’¹⁰ The first bat books were not specifically designed to be astronomical tools: they carried texts as diverse as historical chronicles, legal texts, liturgical or philosophical treatises, as well as medical recipes, and, early as it was, calendars and computistical tables. They were easy to transport as they were smaller than codices with the same text, but also thicker and a good choice for scholars or practitioners wanting to travel with lots of texts.

On that market, however, they would soon face competition from what we now call ‘pocket bibles’, which are small-dimension codices featuring very thin parchment and small script, thus containing a lot of text in a small and light book. They were easier to make and easier to use.¹¹

The earliest bat book known to Gumbert is a partially preserved compendium of historical texts on Glastonbury Abbey, today in the Bodleian Library, dated around 1265. He identifies six more of the oldest, non-astronomical bat books from the thirteenth century.¹²

Around 1300, however, such textual bat books had disappeared in the face of the competition. They only remained the preferred alternative for tabular content, in fact, mostly calendars or astronomico-computistical tables. Calendars need a large surface for content that cannot be divided over several leaves nor written too small as offered by the pocket bible technology, but in return, they do not need many leaves, usually about fifteen if we count one leaf per month plus a few extras. In the fourteenth and fifteenth centuries, Gumbert identifies fifty-six bat books, only three of which are not calendars or almanacs in tabular form: a Bosnian collection of prognoses, following a calendar sequence but in textual form, dating from the 1450s, now in Parma, and two ‘late breviaries’ dating to the

8 André Vernet, *La Bibliothèque de l'abbaye de Clairvaux du XIII^e au XVIII^e siècle* (Paris: Editions du Centre national de la recherche scientifique, 1979), I, p. 334, #2221: ‘Item une autre Journal fait en manière d’une cliquette de ladre, et y sont les leçons et respons d’après Pasques et Pentecoste et le commun des saintz, commençant on second feuillet d’après le kalendier || nostre configuratum et finissant on penultime pedibus marinos || Ainsi signé &55’. See Gumbert, *Bat Books*, p. 19, note 8.

9 Most of this description is borrowed from Gumbert, *Bat Books*, passim.

10 Gumbert, *Bat Books*, p. 23.

11 Gumbert, *Bat Books*, pp. 24–25.

12 Gumbert, *Bat Books*, p. 25.

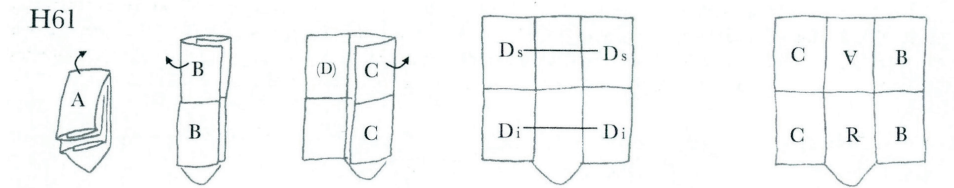


Figure 2. Gumbert's figure of the H6l pattern.

© Johan Peter Gumbert, *Bat books: A catalogue of folded manuscripts containing almanacs or other texts* (Turnhout: Brepols, 2016), p. 20. Reproduced with permission.

Latin 7478 has a H6r pattern: its leaves open on the top as well, but the first compartment to be unfolded (B) is then on the right, and only the last one (C) is on the left.

late-fifteenth or even early-sixteenth century and seeming to be witnesses of a surprising Cistercian trend that might be related to the invention of printing.¹³

All of the other fifty-three bat books from the fourteenth and fifteenth centuries can be described as 'calendars' or 'almanacs', two categories for which a dividing line is not always very easy to determine. Gumbert distinguishes between 'Continental Calendars' (nine + Parma prognoses), 'Continental Almanacs' (14), and three types of 'English Almanacs'; 'Early' (10), 'Mid-[Fifteenth] Century' (5) and 'Late' (15).¹⁴ This census gives a new scope to a phenomenon long believed to be specifically English. The distinction Gumbert draws between calendars and almanacs is described as astrological; while calendars might encompass some basic precalculated astrological data such as lucky days, they are mostly filled with liturgical content. Some are perpetual calendars, sometimes with basic computistical tables, mostly to find the golden number and the date of Easter. On the other hand, an almanac gives enough astronomical information to allow an astrologer to make his own predictions in a variety of subjects.¹⁵

1.3. Latin 7478: A codicological description

Gumbert classes manuscript BnF Latin 7478 in the 'Continental Almanacs' category. He dates it, convincingly enough, to 1456 Italy, as we shall see later.

Latin 7478 has seventeen leaves, measuring 10 × 7 cm folded and 19 × 22 cm unfolded, making it rather large for a continental bat book. All leaves are folded to the same pattern, categorized by Gumbert as a 'H6r' horizontal pattern (cf. Fig. 2). This pattern, one of the main seven known to Gumbert, is somewhat uncommon; most bat books used rather a vertical pattern — the last fold being vertical, which means that each leaf first opens on

¹³ Gumbert, *Bat Bbooks*, pp. 24 and 207–8.

¹⁴ Gumbert, *Bat Books*, pp. 40, 73, 121, 153, 160 (respectively).

¹⁵ We qualify this distinction in the following paragraphs. In fact, astronomical information related to almanacs tends to be limited to a more effective indication of the dates and hours of syzygies than just the golden number, which does not allow much direct astrological use without further calculations. It is important to note that Gumbert's educated distinction does not necessarily reflect any self-designation as 'kalendarium' or 'almanach' in the bat books' titles or canons.

the right or left, whereas the leaves of Latin 7478 open on the top. The H6 pattern is rare but not distinctive: Gumbert found instances in every time period and place, whereas a V8 pattern, for instance (with eight compartments instead of six), would have been characteristic of the late English almanacs.¹⁶

Except for the first leaf, which is probably sewn backwards, maybe due to a rebinding mistake, the folded part is first visible on the recto while looking at the manuscript like a codex; however, it has to be turned to be read, so that the tabs (or now the binding) always remain at the bottom. Most of the content, and especially the tabular content, is written on the unfolded face of the leaves. In most cases, the folded recto and verso are mainly the support for a repeated title, and all intermediary compartments are empty. However, this leaves very little space for canons and commentary, and on some leaves, part of the text goes over the edges of the folded compartments. On the first leaf, the copyist seems to have made use of this possibility without careful consideration; the text initiated on the unfolded face extends onto an intermediary compartment. It is thus only readable with the leaf half-folded. When completely folded, it appears as a partial (and unusable) text beside the title. By contrast, one of the last leaves, the *tabola ad inveniendum ciclum solarem et lunarem* (f. 15) exploits all compartments, allowing different texts, schemas, and tables to be read in any position. This could be a clue that the quality of the codicological features of the copyist may have improved through experience while manufacturing this copy.¹⁷

While sharing the H6r pattern, the last leaf, copied on a different, less refined sort of parchment — but seemingly by the same hand — might be a later adjunct. Describing the earthly and heavenly spheres with scarce verses giving the rotation period of each planet, it is also less in tune with the rest of the almanac, which we shall now consider.

2. A rare copy of a widespread *Kalendarium*

2.1. A late anonymous almanac

Like most bat books, Latin 7478 is mostly a seventy-six-year lunations calendar with some astronomical and astrological additions. The first leaf is called ‘Tabula quattuor cyclorum decemnovenaliū’ (*tabula 4^{or} ciclorum 19^m*) and contains a diagram that is used to obtain the golden number of each of the seventy-six plus two years included, 1456–1533. Additionally, there are brief canons explaining how to use it, together with the following calendar, to find the precise date and time (to the minute) of each of the luminaries’ mean conjunctions and oppositions in those seventy-eight years.¹⁸ The next twelve leaves, folios 2–13, are dedicated to the calendar, one per month. Each displays a table with a line for each day of the month, and four sets of columns including:

¹⁶ Gumbert, *Bat Books*, p. 20.

¹⁷ This would mean that Latin 7478 is the first bat book manufactured by its copyist. We revisit this hypothesis in the last part of this paper.

¹⁸ Cycles of seventy-six years were widely used throughout the medieval era as they combined the four-year solar cycle and the nineteen-year lunar cycle, thus making them particularly accurate in describing and predicting luni-solar phenomena, both astronomical and liturgical (see below).

- dates and times of mean conjunctions and oppositions for each cycle, depending on the year's golden number;
- core calendar data (golden number, Sunday letter, Roman date, and number of the day);
- a textual qualification (mostly liturgical feasts and rites, but occasionally brief astronomical or astrological information);
- an additional sub-table gathering the Sun longitude in degrees, the lunar letter (*littera signorum*: allowing the calculation of the Moon longitude in signs with the help of the table on f. 14), length of the day, time of sunrise, and time of sunset.¹⁹

The next leaf, folio 14, is a *tabula signorum lune per totum annum*, using the golden number and lunar letter (found in the calendar) to equate the zodiacal position of the moon at any time of the nineteen-year cycle. It is completed with short canons and basic warnings on what to do and not to do while the moon is in each zodiacal sign, which would allow someone to calculate auspicious periods.

These first fourteen leaves work as a whole, as if they could be distributed separately without any lack of information. The next three are additional and allow further liturgical calculations.

Folio 15 is the most complicated one as it features several folded compartments. It is entitled 'Tabula ad inveniendum ciclum solarem et lunarem', and it gives computistical data, with two diagrams on the unfolded face: on the left, the first one equates a golden number (*numerus aureus*), an epact (*pacta*), and liturgical keys (*claves terminorum*) for the years 1456–74; on the right, the second diagram gives the dominical letters for the years 1456–83. Short canons are given underneath and continue on the unfolded 'B' face, beginning with 'si vis invenire lunam cotidie'. On the unfolded 'C' face, a more astrologically oriented table helps us to find the ruling planet for each hour of the week. Finally, on the folded verso, a drawing of two hands explains how to manually count the liturgical keys to find the date of the moveable feasts. On this leaf, we also find the copyist's signature and date: *1456, 25a die 7tembris, frater Paulus de Kignin*, above some additional mnemonics for the liturgical keys.²⁰

Folio 16 is a classical *tabula ad inveniendum festa mobilia et ebdomadas*, making it possible to calculate the date of the liturgical feasts with only the golden number (or epact) and the Sunday letter (even when we know nothing of the liturgical keys).

As we have already seen, the final leaf, folio 17, is somewhat different to the preceding ones. In all likelihood written by the same hand but on a different, cruder sort of parchment, it might be a later adjunct, or a sign that the bat book maker was a little short on raw material. The content is also very peculiar: without a title, it contains a sort of combination of a didactic cosmographical system diagram and a small geographical *mappa mundi* (Fig. 3a). All earthly and heavenly spheres are depicted as concentric circles, one for each of the four elements, water coloured in green, air in blue, and fire in red, and one for each of the planets, including the duration of its revolution. While this sort of diagram is fairly

19 These astronomical data and their source are investigated in the next section. See also their transcription in the Appendix.

20 We further investigate the identity and role of Paulus de Kignin (or 'Szignin') in the final section of this paper.

common in didactic literature in the last centuries of the Middle Ages, its 'Earth sphere' is usually very schematic as well, often just a 'T-O' figure. This *mappa mundi* drew historians' attention because of its detailed geographical depiction.²¹ Although too small to be as precise as the large and meticulous contemporary maps, this figure is not as schematic as most *mappae mundi*, usually presenting continents as compartments (T-O and Y-O maps, for instance) or zones (such as the ptolemaic *climata*). On the contrary, it depicts a realistic geographical description centred on the Mediterranean Sea, with north on top and labels such as 'Francia', 'Spania' (?), 'Italia', 'Turchia', 'Caucasia' or 'Egyptus', and a clear focus on central Europe ('Polonia', 'Ungaria', 'Scla[via]', 'Alba').²²

Except for the copyist's name, the date, and some conclusions we can draw from the choices made for the cycles and for the sanctorale, manuscript Latin 7478 does not contain much information about its origin and the work from which it was copied. Gumbert observes that the almanac is neither Peter of Dacia's *Kalendarium* — the most popular in his 'Continental Almanacs' category of bat books — nor one of John Somer's or Nicholas of Lynn's (mostly copied in the fifteenth century) English Almanac bat-books.²³ This is probably due to the fact that, having been copied in 1456, Latin 7478 is a very late example of a continental almanac, and at that time, Peter of Dacia's 1292 *Kalendarium*, even updated, was mainly obsolete. Even John Somer's and Nicholas of Lynn's 1397–1462 almanacs would not have been useful for very long in 1456. In fact, a study of the cycles chosen by Paul of Kignin (or his patron) shows that he updated a 1439–1514 76-year calendar. In order to begin in 1456 without 'wasting' almost an entire cycle, he changed the initial diagram (f. 1D, see Fig. 4) to switch the first cycle from 1439–57 to 1514–33. The last two years, 1532 and 1533, are given a marginal equivalence to 1456 and 1457. The offhandedness with which this 'update' is presented above the original layout, not to mention the neglected consequences on the syzygy times, leads us to think that this decision did not originate from a very skilled astronomer (or even calendar-maker).

21 *Mappemondes AD 1200–1500*, p. 61, #23.

22 *Mappemondes AD 1200–1500* categorizes this sort of mappemonde as a 'type D', or 'ecumenical mappemonde with nomenclature and configurations'. In his 1852 *Atlas composé de mappemondes et de cartes hydrographiques et historiques depuis le XI^e jusqu'au XVII^e siècle... devant servir de preuves à l'ouvrage sur la priorité de la découverte de la cote occidentale d'Afrique au delà du Cap Bojador par les Portugais et à l'histoire de la géographie du Moyen Âge*, the viscount of Santarém, Manuel Francisco de Barros e Sousa (1791–1856), reproduces two such mappemondes (sadly with a very vague quotation of the manuscripts in which he found them): this one, *monumento LV* (plate 7, #13), as a 'geographical system found in a manuscript of the beginning of the 14th century' [*sic*], and another one, very similar, labelled: 'planisphere found in a geographical poem manuscript of the fifteenth century' (mon. XCIX, pl. 26, #1, see Fig. 3b). I have not been able to identify this other manuscript, but it seems highly probable that it is either the direct source of Latin 7478 mappemonde or the copy of a close common source. I have consulted the Santarém Atlas through its 1989 facsimile edition: Manuel Francisco de Barros e Sousa de Mesquita de Macedo Leitão e Carvalhosa Santarém, *Atlas du vicomte de Santarem*, facsimile edition of the final maps (Lisbon: Administração do Porto de Lisboa sous les auspices de la commission nationale pour les commémorations des découvertes portugaises, 1989). The textual description in Manuel Francisco de Barros e Sousa de Mesquita de Macedo Leitão e Carvalhosa Santarém, *Essai sur l'histoire de la cosmographie et de la cartographie pendant le Moyen Âge et sur les progrès de la géographie après les grandes découvertes du xve siècle*, 3 vols (Paris: impr. de Maulde et Renou, 1848–1852), III, pp. 227–29 (LXXXVII), quoted by *Mappemondes AD 1200–1500*, is similar to, but not consistent with, either of these two mappemondes, both with north on top, and it could be a third, more distant witness.

23 Gumbert, *Bat Books*, pp. 74–75.

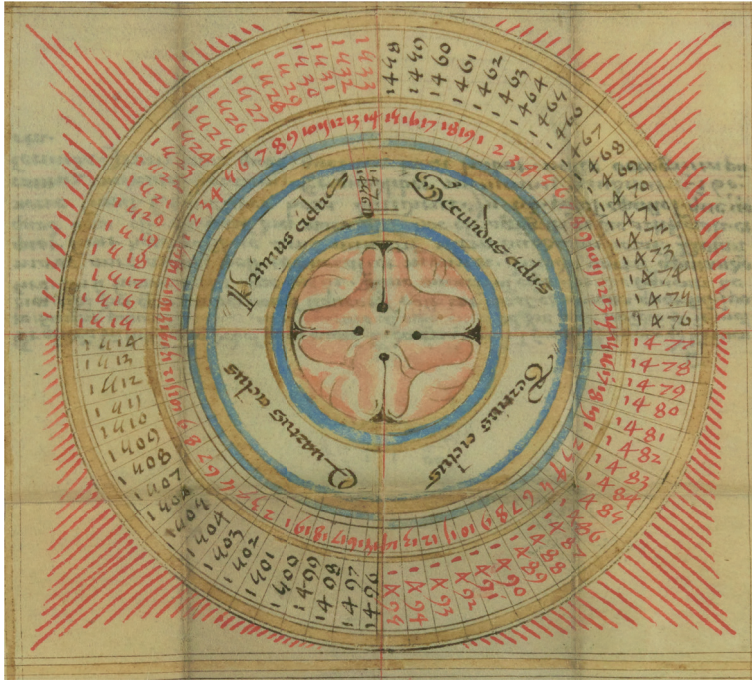


Figure 4. Diagram of the years constituting the four cycles, Paris, BnF, Latin 7478, folio 1Ds. Source gallica.bnf.fr.

On the other hand, the unusual composition of each cycle, the non-updated astronomical data of the calendar, and even some of the canons help point to another fifteenth-century, influential seventy-six-year calendar: John of Gmunden's calendar for 1439–1514.²⁴ Indeed, it turns out that most (but not all) of the content of Latin 7478 originates from Gmunden's calendar, although it is, to our knowledge, the only bat book for which this is the case.

2.2. Works (mostly) copied from John of Gmunden

John of Gmunden (before 1385–1442) was a skilled astronomer and prominent figure at the University of Vienna. Besides his lectures on mathematics, physics, and astronomy, he introduced the Alphonsine Tables in Vienna and computed syzygy calendars, first for 1420–38, and then 1439–1514. These belong to the last generation of what Philipp Nothaft

²⁴ Unlike most bat-book almanacs, Latin 7478's nineteen-year cycles do not match the Metonic cycles: the first year of each cycle has a golden number of fifteen (and the Metonic cycle starts back on the sixth year of these cycles). Although this is astronomically correct, it does not seem the most obvious choice, and the calendars of Peter of Dacia, John Somer, and Nicholas of Lynn all used a Metonic cycle, even when they did not date from the first year of the cycle. This is another hint that the original author of this almanac was mastering the astronomical science behind the calendar cycles and could have easily changed them to update the almanac, rather than naively switching years.

calls 'enhanced calendars'.²⁵ According to Nothaft, the production of such calendars from the late-thirteenth to the fifteenth century was a reaction to the inactivity of the Church when it came to addressing the growing gap between the 'official syzygies' (as they could be deduced from the golden number according to the Nicaea instructions) and the observed ones, and the liturgical consequences in computing the moveable feasts. In this sense, Gmunden's calendars, improving on those of predecessors such as the pseudo-Grosseteste, pseudo-Bacon, Peter of Dacia, William of Saint-Cloud, John Somer, or Nicholas of Lynn, proved at least as influential as his astronomical tables, with more than 150 remaining copies in Latin and German, and even printed adaptations.²⁶ His successors in Vienna, Georg Peurbach and Regiomontanus, continued his almanac work, not without bringing their own influence.

In this sense, it is unsurprising that a mid-fifteenth-century Italian bat book maker like Paul of Kignin (or his patron) would turn to Gmunden's calendar; why he would not proclaim it, placing himself under the moral authority of the renowned astronomer, is more of a surprise.

It must be underlined that, unless it was copied onto an already heavily altered copy, the manuscript Latin 7478 is not an exact reproduction of Gmunden's calendar, as it is found in most codices.²⁷ While it usually takes no more than twenty leaves (including twelve for the calendar), Paul of Kignin seems to have tried to save as much space as possible, mostly by cutting or abbreviating canons and auxiliary tables. On the other hand, he added some related content not originating from Gmunden (at least, not from the copies we have seen). Table 1 summarizes the main differences.

Table 1. Comparison between Latin 7478 and Gmunden's calendar (Cod. 2440).

Gmunden (Cod. 2440)	Latin 7478
F. 1 ^v –13 ^f . Calendar.	F. 2D–13D. ²⁸ Calendar. [<i>Mostly identical</i>]
F. 13 ^v . Rota: golden number and liturgical key for a 19-years cycle, adaptable for the years 1439–1818 ('Aureus numerus 15 et clavis festorum mobilium 22 ad annos hic in parva tabula descriptos').	F. 15D (left). Rota: golden number, epact and liturgical key for a 19-years cycle, 1456–1474.
Canon: 'Si vis scire aureum numerum alicujus anni ...'	Canon: 'Queras in hac rota aureus numerus, claves terminorum et pactam ...' [<i>Adapted</i>]

- 25 C. Philipp E. Nothaft, *Scandalous Error: Calendar Reform and Calendrical Astronomy in Medieval Europe* (Oxford: Oxford University Press, 2018), see, in particular, chapter 5.1.
- 26 See Rudolf Klug, *Der Astronom Johannes von Gmunden und sein Kalender* (Linz: Pirngruber, 1912), and, more recently, Kathrin Chlench, Beatriz Porres de Mateo, and Rudolf Simek, 'Johannes von Gmunden: Personalbibliographie und Handschriftenverzeichnis', in *Johannes von Gmunden (ca. 1384–1442): Astronom und Mathematiker (2006)*, ed. by Simek and Chlench (Vienna: Fassbaender, 2006), pp. 183–223.
- 27 Unfortunately, Gmunden's *Kalendarium* lacks a critical edition. In comparing it to BnF Latin 7478, we have used the following manuscripts: Vienna, ÖNB, Cod. 2440, ff. 1^v–13^f, which is usually considered an early copy or even an autograph of John of Gmunden; Munich, BSB, Clm 14504, ff. 1^v–20^f (digitized online: <http://mdz-nbn-resolving.de/urn:nbn:de:bvb:12-bsb00046291-3>); Dresden, SLUB, Mscr. F.95.
- 28 When needed, we used Gumbert's way of referring to each compartment of a bat book leaf, as shown in Fig. 2. We caution that Latin 7478 is in fact a H6r bat book, which means that compartment B unfolds first on the right, then C on the left (symmetrically to what is represented in Fig. 2 for a H6r bat book).

Gmunden (Cod. 2440)	Latin 7478
F. 14 ^r . Rota: dominical letter for a 28-years cycle, adaptable for the years 1439–1831 ('Cyclus solaris 20 littera dominicalis 7 ad annos hic in parva tabula descriptos'). Canon: 'Si litteram dominicalem et numerum cycli solaris in aliquo anno scire volueris...'	F. 15D (right). Rota: dominical letter for a 28-years cycle, 1456–1483. Canon: 'Queras in hac rota litteram dominicalem ab annis Domini 1456...' [Adapted]
F. 14 ^v . Tabula intervalli. Canon: 'Si vis scire intervallum, id est numerum septimanarum que sunt a festo Nativitatis Christi...'	[Missing]
F. 14 ^v –15 ^r . Canon: 'Si vis scire quandoque festa mobilia, scilicet 70 ^{me} , 40 ^e , Pasce, Rogationum et Penthecostes, vide primo in kalendario loca clavium istorum festorum...'	[Replaced]
	F. 15B. Canon: 'Si vis invenire lunam cotidie, id est quot dies habet et quando facit revolutionem...' F. 15B. De clavibus. 'Prima igitur Jan[uari]i jacet 70 [Setpuagesime] clavis...' F. 15R. Diagrams and short canons to compute manually epacts and liturgical keys: 'Idem quando est bisextus cuilibet clavi...'
F. 15 ^r –16 ^v . Canon: 'Si per has duas tabellas in aliquo anno volueris scire intervallum, et quandoque festa mobilia...'	F. 16D. Canons: 'Omnia festa mobilia et ebdomadas cum diebus superfluis invenies super litteram dominicalem...' [Adapted and shortened]
F. 15 ^v . Table of Easter letters depending on golden number and dominical letter.	[Missing]
F. 16 ^r . Table of moveable feasts and intervals depending on Easter letter, golden number and dominical letter.	F. 16D. Table of moveable feasts and intervals depending on golden number and dominical letter.
F. 16 ^v –17 ^r . Canon: 'Ad sciendum per hoc kalendarium tempus conjunctionum et oppositionum solis et lune...'	F. 1Ds. Table of the years constituting the four 19-years cycles. ²⁹ F. ~1Di–1BRC. Canon: 'Ad sciendum per kalendarium sequens tempus conjunctionum et oppositionum solis cum lune...' [Abbreviated]
F. 17 ^v . Tabula continuationis conjunctionum et oppositionum. Canon: 'Transactis igitur 76 annis, quod erit anno Domini 1515 currente, si post hoc vis scire tempus conjunctionis vel oppositionis...'	[Missing]
F. 18 ^r . Canon: 'Si vis scire in quo signo zodiaci et quotto gradu ipisus sit sol quocumque die anni...'	[Missing]

29 See Fig. 4. While this table is clearly derived (and adapted) from Gmunden's cycle choices, there is no equivalent table in any of the Gmunden manuscripts we have been able to check.

Gmunden (Cod. 2440)	Latin 7478
F. 18 ^v . Tabula signorum lune etc. F. 19 ^r . Canon: 'Si scire desideras quocumque die anni in quo signo sit luna, intra kalendarium precedens cum die mensis prout dictum est de sole...'	F. 14D (left). Tabula signorum lune per totum annum. [<i>Identical</i>] F.~14Di. Canon: 'Si scire desideras quocumque die anni in quo signo sit luna, intra kalendarium precedens cum die mensis...' [<i>Abbreviated</i>]
F. 19 ^v . Canon: 'Ad habendum autem bonum tempus seu malum pro flebotomia seu minutione...'	[<i>Replaced</i>]
	F. 14D (right). Verses giving the medical qualities of each sign: 'Aries: nil capiti facias, Aries cum luna refulget. Brachia tunc minuas...' ³⁰
	F. 15C. Table of the hourly ruling planets. Canon: 'Si vis scire dominationem planetarum in omni hora...'
F. 20 ^r . Canon: 'Si vis scire quantitatem, id est numerum horarum et minutorum diei artificialis et etiam noctis per kalendarium precedens...'	[<i>Missing</i>]
F. 20 ^v . Canon: 'Si vis scire quotta hora et quotto minuto oriatur sol vel occidat aliquo die...'	[<i>Missing</i>]
	F. 17D. Diagram: earthly and heavenly spheres, with a mappemond and the duration of each planet's revolution.

While Latin 7478 is globally adapted from Gmunden's calendar, significant differences remain both on large and smaller scales. Most canons are abbreviated or adapted, even when they have the same incipit and/or address the same topic. Diagrams and tables are also affected. There is in fact much ingenuity in the way Gmunden's two tables for moveable feasts are very practically condensed into one with a very limited loss of information. In a similar way, Gmunden's rotas for finding the golden number and dominical letter of any given year (up to the nineteenth century) are adapted to match only one cycle, sparing one table each while losing mostly useless information. It is noteworthy that the canons are also adapted, and their new version, coherent with the new diagrams, remains very intelligible, avoiding a rather common flaw in the late Middle-Ages process of adapting diagrams.

These are clues that Paul of Kignin was probably using an intermediary source between Gmunden (as handed over in ÖNB Cod. 2440) and his own copy. In fact, manuscript Latin 7478 abounds in hints that its copyist was not a skilled astronomer himself. The curious Latin spelling of technical words, for instance, already noticed by Gumbert, or the

30 These are popular verses from the *Salernitan Regimen sanitatis*, (mostly) as edited in: *Collectio Salernitana ossia documenti inediti, e trattati di medicina appartenenti alla scuola medica Salernitana*, ed. by Salvatore de Renzi (Naples: Filialre-Sebezio, 1852), I, pp. 486–87. See also the transcription in the Appendix.

Table 2. Tables of mean syzgies for the first cycle in June (Cod. 2440 and Latin 7478).

	Gmunden (Cod. 2440)						Latin 7478					
	Conjunctio			Oppositio			Conjunctio			Oppositio		
	h	m		h	m		h	m		h	m	
1	5	10	54				5	10	54			
2	13	23	35	9	5	15	13	23	35	9	5	15
3												24
4	2	19	44	17	1	24	2	19	44	17	1	5
5				6	14	5				6	14	46
6	10	8	25				10	8	25			
7				14	2	46				14	2	55
8	18	4	34	3	22	55	18	4	34	3	22	36
9	7	17	15				7	17	15			
10				11	11	36				11	11	45
11	15	13	25				15	13	25			
12				19	7	45				19	7	26
13	4	2	6	8	20	26	4	2	6	8	20	35
14	12	14	47	16	16	35	12	14	47	16	16	16
15	1	10	56				1	10				
16	9	23	37	5	5	16	9	23	56	5	5	57
17				13	17	57				13	17	6
18	17	19	48				17	19	37			
19				2	14	6				2	14	47
20	6	8	27				6	8	46			
21	14	21	8	10	2	47	14	21	27	10	2	56
22				18	22	56				18	22	37
23	3	17	17				3	17	8			
24				7	11	37				7	11	47
25	11	5	58				11	5	58			
26				15	7	47				15	7	28
27	19	2	7	4	20	28	19	2	7	4	20	9
28	8	14	48				8	14	48			
29	16	10	57	12	9	9	16	10	57	12	9	9
30	5	23	38	1	5	18	5	23	38	1	5	18

dubious grammatical ‘corrections’ that appear when comparing the text of the canons is one such hint. His treatment of the astronomical data in the calendar is even more conclusive.

The twelve monthly tables of Latin 7478 are mostly identical with the examined Gmunden manuscripts. The structure is preserved; only the Easter letters, which appear in March and April on ms. ÖNB 2440 are missing in Latin 7478, which was to be expected as the auxiliary table they feature in has also been removed. The data itself is mostly identical, except for what seem to be copy mistakes. Out of the 9108 numbers displayed in the twelve month tables, we count 271 ‘deviant’ numbers, different from ÖNB 2440 (one in

thirty-four). While they mostly concern minutes, they could, albeit rarely, be computation approximations.³¹ Some are obvious misreadings (some even corrected afterwards), and in certain cases an entire column is displaced, involving a chain of errors (cf. Table 2). We incidentally learn that tabular data was often copied by column and not by row.³²

Even more noteworthy is the initiative to shift the first nineteen-year cycle. As described above, Paul of Kignin decided to abandon Gmunden's first nineteen-year cycle (1439–57), which was already almost over when he copied the manuscript in 1456, to replace it with a new cycle for 1515–33 at the end of the original timespan. In doing so, he seems to have forgotten that seventy-six-year calendars are not, in fact, perpetual calendars, and while a simple addition is enough to go from one cycle's syzygy times to the fifth, it is still a mandatory operation. In fact, Gmunden gives specific instructions to do so, even providing a shift table to allow the computing of new cycles up to the nineteenth century.³³ The astronomer who helped Kignin prepare his material (or maybe wrote the copy he drew from) would have known he had to subtract five hours, fifty-two minutes, and thirteen seconds from the 1439–57 cycle's syzygy times. Kignin only changed the initial diagram associating years with each cycle, thus placing inaccurate times in the calendar.

3. How was a bat-book almanac useful in the mid-fifteenth century?

3.1. A medical-astrological companion or a liturgical tool?

In spite of Hilary Carey's and Johann Gumbert's serial studies on folded almanacs and bat books as a genre, the context of how they were used remains largely hypothetical. Analysing twenty-nine English folded almanacs, Carey postulates a mostly astrological use for medical practitioners, and a real influence in diffusing astrological medicine in fifteenth-century England.³⁴

Based on bat books adapted from John Somer's and Nicholas of Lynn's almanacs, these conclusions do not apply very well to Latin 7478. Similarly to the *Kalendarium* it derives from, Latin 7478 only offers very limited astrological or medical data.³⁵ Except for syzygy times, the calendar only gives an approximation of the solar longitude to the degree, and the way to calculate the lunar longitude to the decan using the dedicated table. Interpretation is limited to well-known brief verses (more concise than the original Gmunden canon) supplying advice for each sign. For instance, the only astrological/medical instruction while the Moon is in Taurus is the following:

31 In rare cases, however, there is room for doubt. See the Appendix below, where the differences between Latin 7478 and ÖNB 2440 are highlighted.

32 This is discussed in Richard L. Kremer's forthcoming edition of John of Murs's *Tabulae permanentes*.

33 ÖNB Cod. 2440, f. 17^v. This table appears in the (few) copies we have checked, but may have not been present in the exemplar Paulus was copying.

34 Carey, 'Astrological Medicine and the Medieval English Folded Almanac'.

35 While it is uncertain whether (and in what extent) Gmunden was involved with astrology in Vienna, very little appears in his *Kalendarium*. See *Johannes von Gmunden - zwischen Astronomie und Astrologie*, ed. by Rudolf Simek and Manuela Klein (Vienna: Fassbaender, 2012).

Trees are to be planted while the Moon have Taurus. You may build, and spread Earth seeds. The physician is not to touch neck with iron.³⁶

Latin 7478 does not contain any medical or astrological addition to the calendar, as is often the case in English almanacs: no Zodiac Man or Vein Man, no information on planetary astronomy, not even bloodletting tips or Egyptian days in the calendar, and no medical canons like those of Nicholas of Lynn (or astronomical ones, like those of John Somer).

Of course, syzygy dates and times have in themselves astrological and medical value, and any portable calendar can prove a useful tool for a medical practitioner, if only for the timing of the remedies, which was crucial in medieval medicine.³⁷ However, this possible use does not seem to be highlighted in Latin 7478.

On the contrary, liturgy is clearly an object of interest in this almanac. This comes as no surprise, as the first objective of ‘enhanced calendars’ like Gmunden’s *Kalendarium* was to correct flaws in the official liturgical calendar.³⁸ As a matter of fact, the *Kalendarium* itself provides more tools to compute the temporal liturgy than astrological or medical ones. These tools, such as the table of moveable feasts, are improved in Latin 7478, and some related tools are added, such as the canons and diagrams on liturgical keys.

This new content is not in itself a major innovation: hand diagrams, for instance, have a widespread tradition going back (at least) to Bede, revitalized by the *computus manualis* literature in the thirteenth and fourteenth centuries.³⁹ Likewise, *claves terminorum* are a dated way of computing liturgical feasts for the fifteenth century, and partly redundant with the table of moveable feasts. By compiling them, however, one seems to provide a portable toolbox for liturgical *computus*.

3.2. A Franciscan vade mecum

The calendar tables themselves bear a very useful piece of liturgical information: the sanctorale. Unlike the numerical data of these tables, Latin 7478’s sanctorale is very distinct from Gmunden’s model.

Of the 377 feasts mentioned in at least one of the two sanctorales (Latin 7478 and Cod. 2440), only 154 are common to both. Latin 7478 is more precise, providing 280 feasts in 198 days (of the 365), against 232 feasts in 214 days in Cod. 2440. That means that Paul of Kignin — at least if he copied from an exemplar using a sanctorale similar to Cod. 2440’s — did not only add new festivals, more suited to his context of production, but he also erased some he found useless, even though he was usually willing to write several festivals for one day.

36 ‘Taurus — Arbor plantetur cum luna Thaurus habebit. Edificare potes, et sperges [*sic for spergas*] semina terre. Et medicus caveat cum fero tangere collum.’ (Latin 7478, f. 14; see the entire transcription in the Appendix and ed. *Collection Salernitana*, p. 486).

37 Carey, ‘Astrological Medicine and the Medieval English Folded Almanac’, pp. 353–54.

38 See above and Nothaft, *Scandalous Error*.

39 See Nothaft, *Scandalous Error* for an overview of the subject. Many thanks to Laura Fernández Fernández for sharing with me her soon to be published paper on computus hand diagrams in RBME Ms. O-II-10, including an extensive bibliography: Laura Fernández Fernández, ‘La mano como herramienta visual mnemotécnica: los diagramas de cómputo del Ms. O-II-10, RBME’, forthcoming.

Latin 7478 also gives liturgical precisions in the style of breviaries' calendars that did not appear in usual copies of Gmunden, such as 'duplex majus', 'duplex minus', 'semi-duplex', 'non tenetur nisi in dominica' (to be celebrated on Sundays only), 'dicitur *Credo* in missa', '*Te deum laudamus* dicitur' etc. (all heavily abbreviated, as to be read by accustomed clerics).

This new sanctorale appears clearly as Franciscan. Of the 128 celebrations added in Latin 7478, fewer than ten do not belong to the classical fifteenth-century Franciscan sanctorale.⁴⁰ On the contrary, some are highly characteristic: St Francis of Assisi (5 October, with octave, translation on 25 May, stigma on 17 September); St Antonius of Padua (13 June, with octave and translation on 15 February); St Clare of Assisi (12 August, with solemn octave and translation on 2 October), St Bernardine of Sienna, recently canonized (20 May).⁴¹ Some others, while not as crucial for the Franciscan liturgy, are known to appear almost exclusively in Franciscan calendars at that time: St Gilbert de Sempringham (4 February), St Patrick of Armagh (17 March), Pope John I (27 May), St Rufina and Secunda (10 July), Popes Anacletus (13 July), Victor (28 July) and Evaristus (26 October), Dedication of the Basilicas of the Apostles Peter and Paul (18 November), etc. Recent canonizations, such as St Nicholas of Tolentino (1446), St Bernardine of Sienna (1450), and St Vincent Ferrer (1455) are also up to date.

This very convincingly points towards a Franciscan context of production, and leads us to believe that Frater Paulus de Kignin, otherwise unknown, was either an active Franciscan Friar in Northern Italy, or working for one.⁴²

3.3. Authorship of Latin 7478: The Case of Paulus de Kignin

To our current knowledge, bat book Latin 7478 seems to be a special case. In order to better understand how it was produced, and to what end, we need to investigate who intervened in this process. We have seen so far that while unacknowledged, most of the content was derived from Gmunden's *Kalendarium*. Some of it, however, was either adapted or replaced, sometimes by other circulating material such as the *Salernitan Regimen sanitatis*. There seems to be at least two players involved in this adaptation: one relatively skilled almanac-maker, able to abbreviate diagrams and tables with a minimal loss of information, and a more naive adapter, involved enough to decide to shift the nineteen-year cycles to fit the current date, but not skilled enough to do so without distorting the syzygy times. It seems logical to identify the latter player with the signing and dating of folio 15B: 'frater Paulus de Kignin' (Fig. 5). It would also seem safe to assume that this apparent friar would be the link with the Franciscan community the sanctorale appears to designate as the final user.

40 Some of those exceptions can in fact be found in the *Franciscano-Tridentinum sanctorale*, or are just displaced (usually celebrated the day before in the classical sanctorale). For this analysis, we used the Grotefend corpus through the IRHT *Calendoscope* database (<http://calendoscope.irht.cnrs.fr/>).

41 St Francis of Assisi on 5 Oct is probably a mistake for 4 October, especially since the octave is to be celebrated on 11 October. The celebration of St Francis on 5 October is only witnessed in a few breviaries from the north of France (Leroquais). This one-day interval occurs for other festivals. See, for instance, the celebration of Frederick III's coronation, 18 June instead of 17 June (1442). St Bernadine of Sienna's feast is annotated directly in the sanctorale: 'Obiit ex [h]ac vita 1444 anno; canonicatus fuit gloriosus confessor 1450 anno' (Latin 7478, f. 6, 20 May).

42 Probably Umbria, maybe Assisi. Particular thanks go to Laura Albiero for confirming this localization, consistent with the presence of Roman and papal feasts in conjunction with others only found in Franciscan-Tridentine sanctorales.

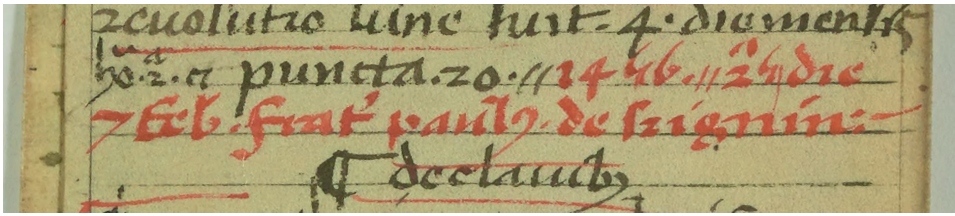
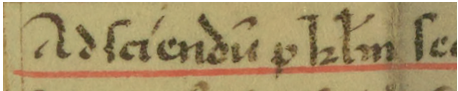


Figure 5. Paulus de Kignin's signature, Paris, BnF, Latin 7478, folio 15B. Source gallica.bnf.fr.



(a) Ad sciendū per klm [kalendarium] (f. 1Di)



(b) Letters 'k', 's', 'z', and 'et' in the table of the signs of the moon (f. 14D)

The name Paulus de Kignin itself is not without suspicion. We have adopted thus far the reading suggested by Johann Gumbert⁴³; while he is probably right to discard Marcel Destombes' 'Paulus de Frignin'⁴⁴, a reasonable alternative would be Paulus de Szignin. Unfortunately, palaeographical evidence is scarce, as this would be the only occurrence of an in-word 'z' in the text, and the letter is indeed formed differently in the calendar tables (cf. Fig. 5).

In any case, we have not been able to find any biographical evidence of the existence of either Paulus de Kignin or Paulus de Szignin in the fifteenth century. Both names would 'sound' Central-European rather than Italian, and 'Szignin' in fact became an attested Hungarian family name a few centuries later. It would obviously be unwise to draw a conclusion from this vague clue; however, there are other hints that Latin 7478 could have originated from Central Europe.

The most obvious is the copy of Gmunden's *Kalendarium* itself. While Gmunden had a European reputation, this particular copy is very close to the 'original' ÖNB Cod. 2440. As we have seen previously, while the canons have definitely been altered, the numerical data remain very close to the Vienna manuscript, and most of the changes seem to be copy mistakes.⁴⁵ There seems to be no attempt, for instance, to shift the syzygies' astronomical hours (counted from noon) into Italian hours (counted from sunset); likewise, daylight duration and sunrise and sunset times, also unchanged, are indeed valid for Vienna and localities with the same geographical latitude, but not for any place in Italy.

In the same way, it is probably not accidental that it reminds us of Holy Roman Emperor Frederick III's coronations (both as King of the Romans and Emperor), but no other sovereign's, not even Pope Callixtus III.⁴⁶ All this would seem in favour of an attempt to export a product of the astronomical network that (even before Matthias Corvinus) linked Vienna, Hungary, and the Imperial Court. The involvement of Georg Puerbach, successor

43 Gumbert, *Bat Books*, pp. 111–12.

44 *Mappemondes AD 1200–1500*, p. 61.

45 See above p. 156 and Table 2.

46 These records are somewhat approximate: King of the Romans on 18 June (instead of 17 June 1442) and Emperor on 12 May (instead of 19 March 1452). See below, p. 177 and footnote 50.

of Gmunden at Vienna University and frequent traveller through Central Europe and Italy (particularly from 1448–51), astrologer of King Ladislas V of Bohemia and Hungary (before joining the service of Frederick III in 1457) should not be discarded.

Conclusion: Is Latin 7478 a prototype of a personalized toolbox for Franciscans?

With a canonical Franciscan sanctorale and ways to easily compute dates of moveable feasts, bat book Latin 7478 proves to be a very useful compendium of official Franciscan liturgy. Portable, with a small but adequate map of the known world, it is suited to the life of a travelling preacher without access to astronomical books. In fact, however it might have been used, this design would at least have been consistent with the Franciscan vocation. This also raises questions of a larger scale production of such bat books by the mendicant orders.

Is Latin 7478 a surviving copy of a serial production? There is, of course, very little evidence to support it. Bat books proved to be fragile materials, and if they were produced in great quantities, not enough survived to attest to that. Even so, Latin 7478 appears to be a special case among the sixty-three bat books known to Gumbert.

Friar Paul of Kignin (or Szignin), who signed the copy, was clearly not an astrologer. This is not to say that he did not play a significant role in the confection of this bat book; he may very well have been behind the adaptation of the sanctorale to the Franciscan liturgy, and perhaps at the origin of some of the structural changes in the composition as well. He seemingly took it upon himself to update the nineteen-year cycles, even if this decision proved somewhat unfortunate.

That raises the question of the exemplar of Gmunden calendar he was working with. Why did he not follow the express canon on how to update the cycles? John of Gmunden saw to it to be easy enough with a little arithmetic, and if Paul of Kignin knew it, he could have at least tried. It seems more probable that he did not cut himself that canon but worked with an exemplar already deprived of it. Similarly, some astute changes, for instance, in condensing the table for moveable feasts, would tend to suggest that he used an already adapted exemplar (but still with the original Gmunden cycles). That may also be a reason why he did not credit Gmunden.

Could this exemplar, probably in circulation in Hungary, have been a bat book, now lost to us? Kignin worked in 1456, fifteen years after the composition of Gmunden's *Kalendarium*. That would have been time enough to adapt it, especially given the (possible) involvement of Georg Peuerbach. Studying Somer's almanacs, Hilary Carey suggests that bat books may have been produced almost at the same time as the codices of the same work.⁴⁷ In itself, the adaptation of the same almanac is not unusual; in the case of John Somer's and Nicholas of Lynn's *Kalendarii*, it happened regularly, both in codex and bat book format. Obviously, the sanctorale was particularly easy to change according to local customs, mostly without updating the astronomical data.⁴⁸ Imagining a mendicant initiative to produce bat books

⁴⁷ Carey, 'Astrological Medicine and the Medieval English Folded Almanac', p. 354.

⁴⁸ *The Kalendarium of Nicholas of Lynn*, ed. by Sigmund Eisner (Athens: University of Georgia Press, 1980). For bat books, cf. Carey, 'Astrological Medicine and the Medieval English Folded Almanac', p. 355. Carey knows of an Oxford-calculated almanac (as attested by the height of the Sun at noon) featuring saints of Northern France, which was probably used there.

based on Nothafft's 'enhanced calendars' as a liturgical tool is appealing; however, it must be stated that it does not explain the massive loss of such bat books. To our knowledge, Latin 7478 would be, in fact, the sole surviving bat book to attest it. Even if this initiative proved less successful and short-lived compared to the astrological and medical one in England, a few other sources to corroborate it would definitely be welcome.

A more humble hypothesis would be that Franciscan Friar Paul of Kignin, a native of Central Europe, came into contact with some material brought by astronomers of the Peurbach network, and realizing it was unknown in Italy, took the liberty (or maybe was given the task) of preparing a prototype to present to the Assisi convent. In doing so, he might have been idealizing the life and needs of a friar on a faraway preaching mission in *Tartaria* or *Egyptis*. For that reason, or maybe because of the cost involved in producing a bat book for a fragile result, his prototype would have been declined by the Assisi Franciscans, or he might have produced it but never delivered. That could explain why we preserve the sole copy in the Bibliothèque nationale de France.

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- Munich, Bayerische Staatsbibliothek, Clm 14504 (John of Gmunden, *Kalendarium*)
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Appendix: A transcription of BnF Latin 7478

Manuscript BnF Latin 7478 has a reference bibliographical record on the *BnF Archives et Manuscrits* online catalogue under the digital id ark:/12148/cc124800v. It is also available as an online facsimile on the *Gallica* digital library (ark:/12148/btv1b100215083).⁴⁹

In the following pages, we intend to offer an extensive transcription of the tables and canons found in Latin 7478. Although some readings remain unsure and some sources unidentified, we hope this material could prove useful to researchers to identify other bat books derived from John of Gmunden's *Kalendarium*, and maybe at some point help produce a critical edition of that work. We caution readers, however, that at this point it is not something that can be expected of this appendix; as a rule, it does not provide a critical or historical apparatus.

For practical reasons, we transcribe the calendar tables (ff. 2–13) and the canons (ff. 1 and 14–17) separately. The calendar itself distinguishes, somewhat artificially, the numerical tables per se (syzygy times, calendar data, Sun and Moon longitude, duration of the day sunrise and sunset times), the sanctorale, and other astronomical information copied textually inside the sanctorale column (for instance, astromedical advice).

In the calendar tables, numbers different from the supposed original manuscript for Gmunden's *Kalendarium*, Österreichische Nationalbibliothek Cod. 2440, are highlighted.

Figure 6. In this transcription, the calendar's lunar letters (*littere signorum*) are displayed as follows: a b c d e f g h i k l m n o p q r s t u v x y z z. Compare, especially, the last three to the way they are formed by the copyist in the reproduction. Paris, BnF, Latin 7484, folio 14D (left). Source gallica.bnf.fr.



Only in the sanctorale section do we provide, in comparison, a transcription of the feasts mentioned in Cod. 2440. Diagrams embedded in the canons are reproduced here as straight tables. While this helps us to understand the operation of said diagrams, we strongly suggest studying their shape as well (as they can be found in the online facsimile) and replace them not only according to a textual tradition but also a 'diagrammatic tradition'.

Likewise, while semantic entities have been formatted as well as possible, we do not render the original red and black ink alternation.

Calendar

Calendar tables

49 Bibliothèque nationale de France, 'Latin 7478', *BnF Archives et Manuscrits* (2020), <<https://archivesetmanuscrits.bnf.fr/ark:/12148/cc124800v>> [Accessed 28 July 2020]. The 2018 digital facsimile is available at <https://gallica.bnf.fr/ark:/12148/btv1b100215083>.

Annus habet dies 365 et 6 horas, habet 12 menses et 52 ebdoma[da]s.
 Habet dies 31^m Ianuarius, luna vero ejus 30.

Primus ciclus		Secundus ciclus		Tertius ciclus		Quartus ciclus		KL		[JANUARIUS]		Littere signorum		Quantitas dierum		Ortus solis		Occasus solis	
Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	KL	Capricornus	h	m	h	m	h	m	h	m
8 10 24	4 16 3	8 2 56	4 8 35	8 19 28	4 1 7	8 12 0	4 17 39	3 a	1	K	20	8	24	7	49	4	11		
16 6 33	12 4 44	16 23 5	12 21 16	16 15 37	12 13 48	16 8 9	12 6 20	3 b	2	N	21	8	27	7	48	4	12		
5 19 14	1 0 53	5 11 46	1 17 25	5 4 18	1 9 57	5 20 50	1 2 29	11 c	3	N	22	16	8 9	8 29	7 47	4 13			
13 7 55	9 13 34	13 0 27	9 6 6	13 16 59	9 22 38	13 9 31	9 15 10	19 d	4	N	23	5	31	7 46	4 14				
2 4 4	6 22 25	2 20 36	17 2 15	2 13 8	17 18 47	2 40 40	17 11 19	8 e	5	N	24	13	9	8 35	7 45	4 15			
10 16 54	14 11 6	10 9 17	6 14 56	10 1 49	6 7 28	10 18 21	6 0 0	16 a	6	I	25	10	31	8 33	7 44	4 16			
18 12 54	3 7 15	7 8 7	3 23 47	18 21 58	14 20 9	18 14 30	14 12 41	4 b	7	I	26	8	37	8 35	7 44	4 17			
7 1 35	11 19 56	15 16 16	11 13 28	7 10 39	3 16 19	7 3 11	3 8 50	2 e	8	I	27	8	39	8 39	7 42	4 18			
15 21 44	19 16 5	4 2 54	19 8 36	15 6 48	11 5 0	15 23 20	11 21 32	10 g	9	I	28	10	41	8 41	7 41	4 19			
4 10 25	19 16 5	4 2 54	8 21 18	4 19 29	8 13 50	4 12 1	19 17 40	18 b	10	I	29	8	44	8 44	7 40	4 20			
12 23 6	8 4 46	12 15 38	16 17 27	12 8 10	16 9 59	12 0 42	8 6 22	7 c	11	I	30	8	47	8 47	7 38	4 22			
1 19 15	16 0 55	1 11 47	16 17 27	1 4 19	5 22 40	1 20 51	16 2 31	13 d	12	I	31	9	5	9 5	7 31	4 29			
9 7 56	5 13 36	9 0 28	5 6 8	9 17 0	13 11 20	9 9 31	5 15 2	15 e	13	I	32	9	8	9 8	7 28	4 32			
17 4 6	2 22 26	17 20 37	13 18 49	17 13 9	2 7 31	17 5 42	13 3 53	4 f	14	K	33	9	10	9 10	7 26	4 34			
6 16 47	10 11 7	6 9 18	2 14 58	6 1 50	10 12 11	6 18 22	2 0 2	12 a	15	K	34	10	9	9 13	7 25	4 35			
14 5 28	18 7 16	3 18 9	10 3 29	14 14 31	18 16 20	14 7 3	18 8 52	1 b	16	K	35	11	9	9 16	7 25	4 36			
3 1 37	7 19 57	11 6 50	7 12 29	3 10 41	18 16 20	3 3 13	7 21 33	17 f	17	K	36	11	9	9 19	7 22	4 38			
11 14 18	15 16 6	19 19 31	15 8 38	11 23 22	7 5 1	11 15 54	15 17 42	6 g	18	K	37	12	x	9 22	7 21	4 39			
19 10 27	4 4 47	19 2 59	4 21 19	19 19 31	15 1 10	19 12 3	4 6 23	9 a	19	K	38	13	y	9 22	7 21	4 39			
8 23 8	4 4 47	8 15 40	8 8 12	8 8 12	4 13 51	8 8 12	4 6 23	14 b	20	K	39	14	3	9 28	7 19	4 41			
								3 c	21	K	40	15	3	9 32	7 16	4 44			
									22	K	41	15	3	9 35	7 14	4 46			
									23	K	42	16	z	9 38	7 13	4 47			
									24	K	43	16	a	9 41	7 11	4 49			
									25	K	44	17	b	9 41	7 11	4 49			
									26	K	45	17	c	9 49	7 10	4 50			
									27	K	46	18	d	9 45	7 8	4 52			

Februarius habet dies 28, quando est bixestus habet dies 29.
Luna vero illo tunc habet dies XXX.

Primus ciclus		Secundus ciclus		Tertius ciclus		Quartus ciclus		KL		[FEBRUARIUS]	
Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	Conjunctio	[Oppositio]			Littere signorum	Quantitas dierum
h m	h m	h m	h m	h m	h m	h m	h m				h m
16 19 17	12 17 28	16 11 49	12 10 0	16 4 21	12 2 32	8 0 44	12 19 4	d	K	e	9 48 7 6 4 54
5 7 59	1 13 37	5 0 30	1 6 9	5 17 2	1 22 41	16 20 53	1 5 13	11 e	4 N	f	9 41 7 5 4 55
13 20 39	9 2 18	13 13 11	9 18 50	13 5 43	9 11 22	16 22 15	9 3 54	19 f	3 N	g	9 44 7 3 4 57
2 17 48	17 22 28	2 9 20	17 15 0	13 5 43	9 11 22	16 22 15	9 3 54	8 g	2 N	h	9 57 7 2 4 58
10 5 29	6 11 9	10 22 1	6 3 41	2 1 52	17 7 31	2 18 24	17 0 3	a	N	i	10 0 7 0 5 0
18 1 38	14 23 50	18 18 10	14 16 22	10 14 33	6 20 12	10 7 5	6 12 44	16 b	8 1 6	k	10 4 6 58 5 2
7 14 19	3 19 40	7 6 51	3 12 31	18 10 42	14 8 54	18 3 14	3 21 35	4 c	7 1 7	l	10 7 6 57 5 3
15 10 28	11 8 49	15 3 0	11 1 12	7 23 23	3 5 3	7 15 55	11 10 16	d	6 1 8	m	10 10 6 55 5 5
4 23 9	30 4 15 41	4 15 41	19 21 21	15 19 32	11 17 44	15 12 4	19 6 25	2 f	4 1 10	n	10 13 6 53 5 7
12 11 50	8 17 39	12 4 22	8 10 2	4 8 13	19 13 53	15 12 4	19 6 25	g	3 1 11	o	10 17 6 52 5 8
1 7 59	16 13 30	1 0 31	16 6 11	12 20 54	8 2 34	4 0 45	8 19 6	10 a	2 1 12	p	10 21 6 48 5 10
9 20 40	5 3 20	9 13 12	5 18 52	12 20 54	16 22 43	12 13 26	16 15 15	b	16 K	q	10 24 6 46 5 12
17 16 50	13 15 1	17 9 22	13 7 33	4 8 13	19 13 53	15 12 4	19 6 25	c	16 K	r	10 28 6 45 5 14
6 5 31	10 23 50	6 22 33	2 3 42	12 20 54	8 2 34	4 0 45	8 19 6	7 d	15 K	s	10 31 6 43 5 15
14 18 12	18 20 0	14 10 44	18 12 32	12 20 54	16 22 43	12 13 26	16 15 15	e	14 K	t	10 39 6 40 5 19
3 14 21	7 8 41	3 6 53	7 1 13	1 17 3	5 11 24	1 9 35	5 3 56	16 f	13 K	u	10 41 6 38 5 20
11 3 2	15 10 50	11 19 34	15 21 22	9 5 44	13 0 5	9 22 16	13 16 27	4 g	12 K	v	10 45 6 36 5 22
19 23 11	19 15 43	19 15 43	19 8 15	17 1 53	2 20 14	17 18 25	2 12 46	a	11 K	x	10 48 6 34 5 24
				6 14 35	10 8 55	6 7 6	6 7 6	12 b	10 K	y	10 53 6 33 5 26
				10 16 23	10 8 55	14 19 47	10 1 27	1 c	9 K	z	10 55 6 31 5 27
				18 12 32	3 16 18 5 4	3 15 57	18 21 37	d	8 K		10 59 6 29 5 29
				7 1 13	11 12 6	11 4 38	15 6 26	e	7 K		11 3 6 27 5 31
				15 21 22	19 8 15	19 0 47	4 19 7	f	6 K		15 a 11 6 25 5 33
								7 g	5 K		16 b 11 10 6 24 5 35
								8 h	4 K		17 c 11 13 6 28 5 36
								9 i	3 K		18 d 11 17 6 22 5 38
								10 j	2 K		19 e 11 20 6 20 5 40

Martius habet dies XXXI.
Luna vero ejus habet dies XXX.

Primus ciclus		Secundus ciclus		Tertius ciclus		Quartus ciclus		KL		[MARTIUS]			
Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	Conjunctio	[Oppositio]			Littere [signorum]	Quantitas dierum	Ortus solis	Ocasus solis
h m	h m	h m	h m	h m	h m	h m	h m				h m	h m	h m
8 11 52	4 17 31	8 4 24	4 10 3	8 10 56	4 2 35	8 13 28	12 7 48	3 d	K 1	20 f	11 24	6 18 5	42
16 8 1	12 6 12	16 17 5	12 15 16	16 17 5	12 15 16	16 9 37	12 7 48	e	N 2	21 g	11 28	6 16 5	44
5 10 42	1 2 21	16 0 33	1 18 53	5 5 46	1 11 25	5 22 18	1 3 57	11 f	N 3	22 h	11 31	6 15 5	45
13 9 23	9 15 3	5 13 14	9 7 34	13 18 27	9 0 6	13 10 59	9 16 38	g	N 4	23 i	11 35	6 13 5	47
2 5 32	17 11 12	2 22 4	17 3 44	13 18 27	9 0 6	13 10 59	9 16 38	19 a	N 5	24 k	11 39	6 11 5	49
10 18 13	6 23 53	10 10 45	6 16 25	10 3 17	6 8 57	10 19 49	6 1 28	8 b	N 6	25 l	11 43	6 9 5	51
10 14 22	14 12 39	18 6 54	14 5 6	18 23 26	14 21 38	18 15 58	14 14 10	c	N 7	26 m	11 46	6 7 5	53
7 3 3	3 8 43	7 19 35	3 1 15	7 12 7	3 17 47	7 4 39	3 10 19	16 d	N 8	27 n	11 49	6 6 5	54
15 23 12	11 21 24	15 15 44	11 13 56	15 8 16	11 6 28	15 0 48	11 23 0	4 e	N 9	28 o	11 53	6 4 5	56
4 11 53	19 17 33	4 4 25	19 10 5	4 10 57	8 15 18	4 13 29	8 7 40	f	N 10	29 p	11 56	6 2 5	58
12 0 34	8 6 14	12 17 6	8 22 44	12 9 38	16 11 27	12 2 10	12 7 40	13 g	N 11	Aries	12 0	6 0 6	0
1 20 43	5 15 4	9 1 56	5 7 36	9 18 28	5 0 8	9 11 0	5 16 40	2 a	N 12	1 q	12 0	5 59 6	1
9 9 25	13 3 45	17 22 5	13 20 17	17 14 38	13 12 49	17 7 9	13 5 21	b	N 13	1 r	12 3	5 58 6	2
17 5 34	2 23 54	6 10 47	2 16 26	6 10 47	2 8 58	6 19 50	2 1 30	10 c	N 14	2 f	12 7	5 57 6	3
6 18 15	10 12 35	14 23 28	10 5 7	14 16 0	18 17 48	14 8 32	10 14 11	d	N 15	3 s	12 10	5 55 6	5
14 6 56	18 8 44	3 19 37	18 1 16	3 12 9	7 6 29	3 4 41	10 20 20	18 e	N 16	4 t	12 14	5 53 6	7
3 3 5	7 21 25	11 8 18	7 13 57	11 0 50	7 6 29	11 17 22	15 19 10	7 f	N 17	5 u	12 17	5 52 6	8
11 15 46	15 17 34	19 4 27	15 10 6	19 20 59	15 2 38	19 13 31	4 7 51	15 a	N 18	6 v	12 21	5 50 6	10
19 2 55	4 6 15	8 17 7	4 22 47	8 9 40	4 15 19	8 2 12	12 20 32	17 b	N 19	7 x	12 25	5 48 6	12
								17 c	N 20	8 y	12 29	5 46 6	14
								17 d	N 21	9 z	12 32	5 44 6	16
								17 e	N 22	10 3	12 36	5 42 6	18
								17 f	N 23	11 z	12 39	5 41 6	21
								17 g	N 24	12 a	12 42	5 39 6	23
								17 h	N 25	13 b	12 46	5 37 6	25
								17 i	N 26	14 c	12 50	5 35 6	27
								17 j	N 27	15 d	12 54	5 33 6	29
								17 k	N 28	16 e	12 57	5 32 6	31
								17 l	N 29	17 f	13 1	5 30 6	33
								17 m	N 30	18 g	13 4	5 28 6	35
								17 n	N 31	19 h	13 8	5 26 6	37

Aprilis habet dies XXX.
Luna vero habet XXIX.

Primus ciclus		Secundus ciclus		Tertius ciclus		Quartus ciclus		KL		[APRILIS]	
Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	KL			
h m	h m	h m	h m	h m	h m	h m	h m				
8 0 36	12 18 56	16 13 17	12 11 28	16 5 49	12 4 0	16 22 21	1 16 41	K 1			
16 20 45	1 15 6	5 18 30	1 7 37	5 18 30	1 0 9	5 13 2	11 16 41	a 4 N 2			
5 9 26	9 3 47	5 1 58	9 20 19	9 12 50	9 12 50	13 23 43	9 5 22	b 3 N 3			
13 22 7	17 23 58	13 14 39	17 16 28	13 7 11	17 9 0	2 19 52	17 1 31	c 2 N 4			
2 18 57	6 12 37	2 10 48	6 5 9	2 3 20	6 21 41	10 8 33	6 14 13	d 8 N 5			
10 6 6	14 1 18	10 23 29	14 17 50	10 16 1	10 16 1	18 4 42	14 2 54	e 8 I 6			
18 3 47	3 21 27	18 19 38	3 13 59	18 12 10	14 10 22	15 13 32	11 11 44	f 7 I 7			
7 1 16	11 10 8	7 8 19	11 2 40	7 0 51	11 19 12	15 13 32	11 11 44	g 6 I 8			
15 11 56	19 6 17	15 4 28	19 22 49	4 9 41	19 5 21	4 2 13	8 20 34	a 5 I 9			
4 0 37	8 18 58	4 17 9	8 11 30	12 22 22	8 4 2	12 14 54	16 16 43	b 4 I 10			
12 13 18	16 15 7	12 5 50	16 7 39	1 18 31	16 0 11	1 11 3	16 16 43	c 3 I 11			
1 9 28	5 3 48	1 2 59	5 20 20	9 7 12	5 10 52	9 23 44	5 5 28	d 2 I 12			
9 22 9	13 16 29	9 14 41	13 9 1	9 7 12	13 31 33	17 19 54	13 18 5	e 13 I 13			
17 18 18	2 12 38	17 10 50	2 5 10	17 3 22	2 21 42	6 8 35	10 2 55	f 14 K 14			
6 6 59	14 1 40	6 23 31	10 17 51	6 16 3	10 10 23	14 21 16	18 23 34	g 10 K 15			
14 1 40	10 1 19	14 12 12	18 14 0	14 4 44	18 6 32	3 17 55	7 11 45	a 16 K 16			
3 15 49	7 10 9	3 8 21	7 2 41	3 0 53	7 19 13	11 13 34	11 4 20 35	b 15 K 17			
11 4 30	15 6 18	11 21 2	15 22 50	11 13 34	15 15 22	11 6 6	15 7 54	c 14 K 18			
19 0 9	4 18 59	19 17 11	4 11 31	19 9 43	4 4 3	8 14 56	12 9 16	d 13 K 19			
8 13 20		8 5 52		8 22 24	12 16 44			e 12 K 20			
								f 11 K 21			
								g 10 K 22			
								a 9 K 23			
								b 8 K 24			
								c 7 K 25			
								d 6 K 26			
								e 5 K 27			
								f 4 K 28			
								g 3 K 29			
								a 2 K 30			

Quantitas dierum		Ortus solis		Occasus solis	
h m	h m	h m	h m	h m	h m
13 12	5 24	6 36			
13 15	5 23	6 37			
13 18	5 21	6 39			
13 22	5 19	6 41			
13 25	5 17	6 45			
13 29	5 15	6 43			
13 32	5 14	6 46			
13 26	5 14	6 48			
13 27	5 12	6 48			
13 29	5 10	6 50			
13 43	5 8	6 52			
13 46	5 7	6 53			
13 49	5 5	6 54			
13 53	5 3	6 57			
13 56	5 2	6 58			
14 0	5 0	7 0			
14 3	4 58	7 2			
14 6	4 57	7 3			
14 9	4 55	7 5			
14 12	4 54	7 6			
14 13	4 53	7 7			
14 15	4 52	7 8			
14 18	4 51	7 9			
14 22	4 49	7 11			
14 25	4 47	7 13			
14 29	4 45	7 15			
14 31	4 44	7 16			
14 35	4 42	7 18			
14 38	4 41	7 19			
14 41	4 39	7 21			
14 44	4 38	7 22			

Madius habet dies XXXI.
Luna vero habet dies XXX^a.

Primus ciclus		Secundus ciclus		Tertius ciclus		Quartus ciclus		KL		[MADIUS]		Quantitas dierum		Ortus solis		Occasus solis	
Conjunctio	Oppositio	Conjunctio	[Oppositio]	Conjunctio	Oppositio	Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	KL	[MADIUS]	h	m	h	m	h	m
16 9 29	12 7 41	16 2 1	12 0 12	16 18 32	1 12 53	16 11 4	1 5 25	11	b	K	1	14	46	4	37	7	23
5 22 10	1 3 50	5 14 42	1 20 22	5 7 14	9 1 35	5 23 46	9 18 6	19 d	c	N	2	20	14	49	4	35	7 25
13 10 51	9 16 31	13 3 23	9 9 3	13 19 55	9 1 35	13 12 27	9 18 6	8 e	d	N	3	21	14	52	4	34	7 26
2 7 2	17 12 40	2 23 32	17 5 12	2 16 4	17 21 44	2 8 36	17 14 16	f	e	N	4	23	14	55	4	32	7 28
10 19 41	6 1 21	10 12 13	6 17 53	6 10 25	6 10 25	10 21 17	6 2 57	16 g	f	N	5	24	14	58	4	31	7 29
18 15 50	14 14 2	18 8 22	14 6 34	10 4 45	14 23 6	18 17 26	14 15 38	5 a	a	N	6	25	15	1	4	29	7 31
7 4 31	3 10 11	7 21 3	3 2 43	18 0 54	3 19 15	18 17 26	14 15 38	8 b	b	N	7	26	15	3	4	28	7 32
15 0 40	11 22 52	15 17 12	11 15 24	7 13 35	11 7 56	7 6 7	3 11 47	13 c	c	N	8	27	15	6	4	27	7 33
4 13 21	8 7 42	4 5 53	8 0 14	15 9 44	8 16 46	15 2 16	11 0 20	2 d	d	N	9	28	15	8	4	26	7 34
12 2 3	16 3 51	12 18 34	16 20 23	4 22 25	19 4 5	4 14 57	19 20 37	e	e	N	10	29	15	13	4	24	7 36
1 22 12	5 16 32	1 14 44	5 9 4	1 7 16	5 1 36	1 23 47	16 5 27	10 f	f	N	11	30	15	16	4	22	7 38
9 10 53	13 5 13	9 3 25	13 21 45	9 19 57	13 14 17	9 12 28	13 6 49	18 a	a	N	12	31	15	18	4	21	7 39
17 7 2	2 1 22	17 23 34	2 17 54	17 16 6	17 8 38	17 8 38	13 6 49	7 b	b	N	13	32	15	20	4	20	7 40
6 19 43	10 14 3	6 12 15	10 6 35	6 4 47	2 10 26	6 21 19	2 2 58	18 a	a	N	14	33	15	21	4	19	7 41
14 8 24	18 10 12	14 0 56	18 2 44	14 17 28	18 19 16	14 10 0	18 11 48	7 c	c	N	15	34	15	23	4	18	7 42
3 4 23	7 22 53	3 21 5	7 15 25	3 13 37	7 7 57	3 6 9	7 0 29	15 d	d	N	16	35	15	25	4	17	7 43
11 17 14	15 19 2	11 9 46	15 11 34	11 2 18	15 4 6	11 18 50	15 20 38	4 e	e	N	17	36	15	26	4	16	7 44
19 13 23	8 7 44	19 5 55	8 0 15	19 22 27	4 16 47	19 14 59	4 9 19	12 g	f	N	18	37	15	29	4	15	7 45
8 2 4	4 7 44	8 18 36	4 0 15	8 11 8	12 5 28	8 3 49	12 22 0	1 a	a	N	19	38	15	31	4	14	7 46
16 22 13	12 10 25	16 14 45	12 12 57	16 7 17	16 7 17	16 23 49	1 18 9	9 c	c	N	20	39	15	33	4	13	7 47

Junius autem habet dies XXX.
Luna vero ejus habet dies XXIX.

Primus ciclus		Secundus ciclus		Tertius ciclus		Quartus ciclus		KL		[JUNIVS]	
Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	Conjunctio	[Oppositio]			Littere signorum	Quantitas dierum
h m	h m	h m	h m	h m	h m	h m	h m				h m
5 10 54	9 5 15	5 3 26	1 9 6	5 19 58	1 1 38	5 12 30	9 6 51	e	K 1	p	5 49
13 23 35	24 13 16 7	13 8 39	9 14 19	13 8 39	9 14 19	13 1 11	19 6 51	f	N 2	q	5 50
2 19 44	17 1 5	2 12 16	17 10 28	2 4 48	17 10 28	2 21 20	17 3 0	g	N 3	r	5 51
10 8 25	6 14 46	10 0 57	6 6 37	10 17 29	6 23 9	10 10 1	6 15 41	a	N 4	f	5 51
18 4 34	14 19 14	18 13 38	14 11 50	18 13 38	14 11 50	18 6 10	14 4 22	b	N 5	s	5 52
7 17 15	3 15 27	7 9 47	3 7 59	7 2 19	3 7 59	7 18 51	13 d 7 1 7	c	I 6	t	5 52
15 13 25	11 4 8	15 22 28	11 20 40	15 22 28	11 20 40	15 1 0	2 e 6 1 8	d	I 7	u	5 53
4 2 6	19 7 26	4 18 37	19 16 49	4 11 9	19 16 49	4 3 41	3 0 31	e	I 8	v	5 54
12 14 47	8 12 58	12 7 19	8 5 30	12 23 50	8 5 30	12 16 22	11 13 12	f	I 9	x	5 54
1 10	16 9 7	1 20 0	16 1 39	1 20 0	16 1 39	1 12 31	8 22 2	g	I 10	y	5 55
9 23 56	5 21 48	9 8 41	5 14 20	9 8 41	5 14 20	9 1 23	19 9 21	a	I 11	z	5 55
17 19 37	13 10 29	17 12 18	13 3 1	14 4 50	13 3 1	17 21 22	8 22 2	b	I 12	a	5 56
6 8 46	2 6 38	6 0 59	2 23 10	6 17 31	2 23 10	6 10 3	7 c	c	I 13	z	5 56
14 21 27	18 15 28	14 13 40	10 11 15	14 6 12	10 11 15	14 22 45	16 18 11	d	K 14	a	5 55
3 17 8	3 9 49	3 9 49	3 2 21	3 2 21	3 2 21	3 18 53	15 e 17 K 15	e	K 15	b	5 55
11 5 58	11 22 30	11 22 30	7 4 9	11 15 2	7 20 41	11 7 34	4 f 16 K 16	f	K 16	c	5 55
19 2 7	15 0 18	19 18 39	15 16 50	19 11 11	15 16 50	19 3 43	13 19 33	g	K 17	d	5 54
8 14 48	4 13 0	8 23 52	4 5 31	8 23 52	4 5 31	8 16 24	2 15 42	a	K 18	e	5 54
16 10 57	12 1 41	16 20 1	12 18 12	16 20 1	12 18 12	16 12 33	9 d 11 K 20	12 a 14 K 18	K 19	f	5 53
5 23 38	1 21 50	1 21 50	1 14 22	1 14 22	1 14 22	1 6 54	10 4 29	1 b 13 K 19	K 20	g	5 54
							14 22 45	c	K 21	h	5 52
							10 11 15	d	K 22	i	5 52
							18 8 0	e	K 23	k	5 51
							7 13 13	f	K 24	l	5 50
							3 18 53	g	K 25	m	5 49
							7 13 13	a	K 26	n	5 49
							15 9 22	6 g 8 K 24	K 27	o	5 48
							4 22 3	7 K 25	K 28	p	5 47
							14 b 6 K 26	a 7 K 25	K 29	q	5 46
							3 c 5 K 27	8 K 26	K 30	r	5 44
							12 10 44	d 4 K 28			5 44
							2 e 3 K 29	e 3 K 29			5 43
							1 6 54	f 2 K 30			5 43

Julius habet dies XXXI.
Luna vero habet 29.

Primus ciclus		Secundus ciclus		Tertius ciclus		Quartus ciclus		KL		[Iunus]		
Coniunctio h m	[Oppositio] h m	Coniunctio h m	[Oppositio] h m	Coniunctio h m	[Oppositio] h m	Coniunctio h m	[Oppositio] h m	KL	[Iunus]	Coniunctio h m	[Oppositio] h m	
13 12 19	9 17 59	5 16 10	9 10 31	5 8 42	9 3 3	5 1 14	9 19 35	19 g	K 1	f	17	
2 8 28	17 14 8	13 4 51	17 6 40	13 21 23	9 3 12	13 13 55	17 15 44	8 a	6 N 2	s	18	
10 21 9	6 2 49	2 1 0 6 19 21	6 19 21	2 17 32	17 23 12	2 10 40	16 15 44	b S N 3	5 N 3	t	19	
18 17 18	14 15 30	10 13 41	14 8 2	10 6 13	6 11 53	10 22 45	6 4 25	16 c 4 N 4	4 N 4	u	20	
7 5 59	3 11 39	18 9 50	14 8 2	18 2 22	14 0 34	18 18 54	14 17 6	5 d 3 N 5	3 N 5	v	21	
15 2 9	11 0 20	7 22 31	3 4 11 16 52	7 15 3	3 20 43	18 18 54	13 f N 7	13 f N 7	22 x	15 33 4 14 7 46	22	
4 14 59	19 20 29	15 18 40	11 16 52	15 11 12	11 9 24	7 7 35	3 13 15	2 g 8 1 8	24 5	15 31 4 15 7 45	23	
1 23 40	8 9 10	4 7 22	19 13 1	4 23 53	8 18 14	15 3 44	19 22 5	a 7 1 9	25 3	15 28 4 16 7 44	24	
9 12 21	5 18 0	1 16 52	16 21 51	12 12 35	16 14 23	12 5 6	8 10 46	10 b 6 1 10	26 z	15 27 4 17 7 43	25	
17 8 30	13 6 41	9 4 53	8 1 42	1 8 44	5 3 4	1 1 16	5 19 36	c 5 1 11	27 a	15 25 4 18 7 42	26	
6 21 11	2 2 50	17 1 2 6 13 43	2 19 22	17 17 34	13 14 45	9 13 57	13 8 17	d 4 1 12	28 b	15 20 4 20 7 40	27	
14 9 52	10 15 31	14 2 24	10 8 3	6 6 15	10 0 34	17 10 6	2 4 26	e 3 1 13	29 c	15 18 4 21 7 39	28	
3 6 1	18 11 40	3 22 33	18 4 12 3	14 18 56	18 20 44	14 11 28	10 17 7	f 2 1 14	Leo d	15 16 4 22 7 38	29	
11 18 42	7 0 21	11 11 14	7 16 53	3 15 5	7 9 25	3 7 37	18 3 16	g 1 15	1 e	15 14 4 23 7 37	1	
19 14 51	15 20 31	19 7 23	15 13 3	11 3 46	15 5 34	11 10 18	7 1 57	15 g 1 15	1 f	15 13 4 24 7 36	1	
8 3 32	4 9 12	8 20 4	4 1 44	19 23 55	4 18 16	19 16 27	15 22 6	a 17 K 16	2 g	15 11 4 25 7 35	2	
16 23 41	1 18 2	16 16 13	12 14 25	8 12 36	12 6 57	8 5 8	4 10 47	b 16 K 17	3 h	15 8 4 26 7 34	3	
5 12 22	9 6 43	5 4 54	9 23 55	5 21 26	9 15 47	16 1 17	1 19 38	12 c 15 K 18	4 i	15 6 4 27 7 33	4	
						5 13 58	9 8 19	d 1 d 14 K 19	5 k	15 3 4 28 7 30	5	
								e 13 K 20	6 l	15 0 4 30 7 29	6	
								f 12 K 21	7 m	14 58 4 31 7 29	7	
								g 11 K 22	8 n	14 55 4 32 7 28	8	
								h 10 K 23	9 o	14 52 4 34 7 26	9	
								i 9 K 24	10 p	14 49 4 35 7 25	10	
								j 8 K 25	11 q	14 46 4 37 7 23	11	
								k 7 K 26	12 r	14 43 4 39 7 21	12	
								l 6 K 27	13 f	14 41 4 40 7 20	13	
								m 5 K 28	14 s	14 38 4 41 7 19	14	
								n 4 K 29	15 t	14 35 4 43 7 17	15	
								o 3 K 30	16 u	14 31 4 45 7 15	16	
								p 2 K 31				

Augustus habet dies XXXI.
Luna vero ejus habet XXX.

Primus ciclus		Secundus ciclus		Tertius ciclus		Quartus ciclus		KL		[AUGUSTUS]			
Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	KL		Littere signorum	Quantitas dierum	Ortus solis	Ocasus solis
h m	h m	h m	h m	h m	h m	h m	h m			h m	h m	h m	h m
13 1 3		13 17 35	17 19 24	13 10 7		13 2 39		K 1		17 v	14 28	4 46	7 14
2 21 12	17 2 52	2 13 44	6 8 5	2 6 16	17 11 56	2 23 48	17 4 28	16 d	4 N 2	18 x	14 25	4 48	7 12
10 9 53	6 15 33	10 2 25	14 20 46	10 18 57	6 0 37	6 17 9	6 17 9	5 e	3 N 3	19 y	14 22	4 49	7 11
18 6 2	14 4 14	18 22 34	3 16 55	18 15 6	14 13 18	10 11 29	14 5 50	f	2 N 4	20 z	14 18	4 51	7 9
7 18 44	3 0 23	7 11 15	3 9 27	7 3 47	3 9 27	18 7 38	13 g	13 g	N 5	21 z	14 15	4 53	7 7
15 14 53	11 13 4	15 7 25	11 22 8	15 23 56	11 22 8	7 20 19	2 a	2 a	1 6	22 z	14 12	4 54	7 6
4 3 34	19 9 13	4 20 6	19 1 45	4 12 38	19 18 17	7 20 19	3 1 59	b	7 1 7	23 a	14 10	4 55	7 5
12 16 15	8 21 54	12 8 47	8 14 26	12 1 19	8 6 58	15 16 28	11 14 40	c	6 1 8	23 b	14 9	4 56	7 4
1 12 24	16 18 3	1 8 47	16 10 35	1 21 28	15 3 7	4 5 9	19 10 49	d	5 1 9	24 c	14 6	4 57	7 3
9 1 5	5 6 44	1 4 56	5 23 16	9 10 9	5 15 48	12 17 51	8 23 30	18 e	4 1 10	25 d	14 3	4 59	7 1
17 21 14	13 19 55	17 13 46	13 11 57	17 6 18	15 3 7	9 2 41	16 19 39	7 f	3 1 11	26 e	14 0	5 0 7 0	
6 9 55	2 15 34	6 2 27	2 8 6	6 18 59	13 4 29	17 22 50	15 a	g	2 1 12	27 f	13 56	5 2 6 58	
14 22 36	10 4 15	14 15 8	10 20 47	14 7 40	5 15 48	6 11 31	4 b	19 K 14	13	28 g	13 53	5 4 6 56	
3 18 45	18 0 25	3 11 17	18 16 56	3 3 49	13 4 29	9 2 41	5 8 20	c	18 K 15	29 h	13 49	5 6 6 54	
11 7 26	7 13 6	11 23 58	7 5 37	11 16 30	13 4 29	17 22 50	13 21 1	12 d	17 K 16	Virgo	13 46	5 7 6 53	
19 3 35	4 21 25	19 20 7	4 14 28	19 12 30	2 0 38	6 11 31	2 17 10	1 e	16 K 17	1	13 39	5 9 6 51	
8 16 16	12 10 37	8 8 48	12 3 9	8 1 20	10 13 19	10 12 31	10 5 51	f	15 K 18	2	13 37	5 13 6 47	
16 12 25	1 6 46	16 4 57	1 23 18	16 21 29	18 9 28	14 0 12	18 2 0	9 g	14 K 19	3 m	13 37	5 13 6 47	
5 1 6	9 19 27	5 17 38	9 11 59	5 10 10	7 22 9	3 20 21	7 14 41	17 b	12 K 20	4 n	13 32	5 15 6 45	
13 13 47	17 15 36	13 6 19	17 8 8	13 12 51	15 18 19	11 9 2	15 10 50	6 c	11 K 22	5 o	13 29	5 16 6 44	
					4 7 0	19 5 11	4 23 32	14 e	9 K 24	6 p	13 25	5 18 6 42	
					12 13 41	8 15 42	12 12 13	3 f	8 K 25	7 q	13 22	5 19 6 41	
					1 15 50	16 14 1	12 12 13	g	7 K 26	8 r	13 18	5 21 6 39	
					1 15 50	16 14 1	12 12 13	11 a	6 K 27	9 r	13 15	5 23 6 37	
					9 4 31	13 15 23	17 17 12	8 d	3 K 30	10 f	13 11	5 25 6 35	
					9 4 31	13 15 23	17 17 12	7 K	26 34	11 s	13 8	5 26 6 34	
					9 4 31	13 15 23	17 17 12	11 a	6 K 27	12 t	13 4	5 28 6 32	
					9 4 31	13 15 23	17 17 12	19 b	5 K 28	13 u	13 1	5 30 6 30	
					9 4 31	13 15 23	17 17 12	5 2 42	9 K 29	14 v	12 57	5 32 6 28	
					9 4 31	13 15 23	17 17 12	13 15 23	3 K 30	15 x	12 54	5 33 6 27	
					9 4 31	13 15 23	17 17 12	8 d	3 K 30	15 y	12 50	5 35 6 25	

September habet diem XXX,
luna 29.

Primus ciclus		Secundus ciclus		Tertius ciclus		Quartus ciclus		KL	
Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	KL	
h m	h m	h m	h m	h m	h m	h m	h m		
2 9 56	6 4 17	2 2 28	6 20 49	2 19 0	17 0 40	2 11 32	6 5 53	16 f	K 1
10 22 37	14 16 58	10 15 9	14 9 30	10 7 41	6 13 21	10 0 13	14 18 34	5 g	4 N 2
18 18 47	3 13 7	18 11 19	3 5 59	18 3 50	14 2 2	18 20 22	18 20 22	13 b	3 N 3
7 7 28	11 1 48	7 0 0	11 18 20	7 16 31	3 22 11	7 9 3	3 14 43	2 c	2 N 5
15 3 37	19 21 57	15 20 9	19 14 29	15 12 41	11 10 52	15 5 12	11 3 24	10 e	7 I 7
4 16 18	8 10 38	4 8 50	8 3 10	4 1 22	8 19 42	4 13 54	8 12 14	18 g	5 I 8
12 4 59	16 6 47	12 21 51	16 23 19	12 14 3	16 15 51	12 6 35	15 8 23	7 a	4 I 10
1 1 8	5 19 28	1 17 40	5 12 0	1 10 12	5 4 33	1 2 44	5 21 4	15 c	2 I 11
9 13 49	13 8 9	9 6 21	13 0 41	9 22 53	13 17 13	9 15 25	13 9 45	4 d	1 I 12
17 9 58	2 4 18	17 2 30	2 20 50	17 19 2	2 13 22	17 11 34	3 5 54	12 f	17 K 15
6 22 30	10 16 59	6 15 11	10 9 31	6 7 43	10 2 3	6 0 15	10 18 34	1 g	16 K 16
14 11 20	18 13 9	14 3 52	18 5 40	14 20 24	18 22 12	14 12 56	18 14 44	9 b	14 K 18
3 7 29	7 1 50	3 0 1	7 18 22	3 16 33	7 10 53	3 9 5	7 3 25	17 d	12 K 20
11 20 10	15 21 59	11 12 42	15 14 31	11 5 14	15 7 3	11 21 46	15 23 35	6 e	11 K 21
19 16 19	4 10 40	19 8 52	4 3 12	19 1 23	4 19 44	8 6 36	4 12 16	14 g	10 K 22
8 5 0	12 23 21	8 21 32	12 15 53	8 14 4	12 8 25	15 2 45	12 0 57	3 a	8 K 23
16 1 9	1 19 30	16 17 41	1 12 2	16 10 13	1 4 34	5 15 26	1 21 6	11 c	6 K 24
5 13 50	9 8 11	5 6 22	9 0 43	5 22 54	9 17 15	13 4 7	9 9 47	19 d	5 K 26
13 2 31	2 22 40	13 19 3	17 20 53	13 11 35	17 13 24	17 5 56	17 5 56	8 f	3 K 28
2 22 40	17 4 20	2 15 12						g	2 K 30

Littere signorum		Quantitas dierum		Ortus solis		Occasus solis	
h m	h m	h m	h m	h m	h m	h m	h m
Virgo	17 3	12 47	5 37	6 23	6 23	17 3	17 3
	18 3	12 43	6 29	6 21	6 21	18 3	18 3
	19 2	12 39	6 41	6 19	6 19	19 2	19 2
	20 a	12 36	6 42	6 18	6 18	20 a	20 a
	21 b	12 32	6 40	6 16	6 16	21 b	21 b
	22 c	12 28	6 46	6 14	6 14	22 c	22 c
	23 d	12 24	6 46	6 12	6 12	23 d	23 d
	24 e	12 21	6 50	6 10	6 10	24 e	24 e
	25 f	12 17	6 52	6 8	6 8	25 f	25 f
	26 g	12 14	6 53	6 7	6 7	26 g	26 g
	27 h	12 10	6 55	6 5	6 5	27 h	27 h
	28 i	12 7	6 57	6 3	6 3	28 i	28 i
	29 k	12 3	6 59	6 1	6 1	29 k	29 k
Libra	1 12 0	12 0	6 0	6 0	6 0	1 12 0	1 12 0
	1 m	11 58	6 1	5 59	5 59	1 m	1 m
	1 n	11 58	6 2	5 58	5 58	1 n	1 n
	2 o	11 53	6 4	5 56	5 56	2 o	2 o
	3 p	11 49	6 6	5 54	5 54	3 p	3 p
	4 q	11 46	6 7	5 53	5 53	4 q	4 q
	5 r	11 42	6 9	5 51	5 51	5 r	5 r
	6 f	11 39	6 11	5 49	5 49	6 f	6 f
	7 s	11 35	6 13	5 47	5 47	7 s	7 s
	8 t	11 31	6 15	5 45	5 45	8 t	8 t
	9 u	11 28	6 16	5 44	5 44	9 u	9 u
	10 v	11 24	6 18	5 42	5 42	10 v	10 v
	11 x	11 21	6 20	5 40	5 40	11 x	11 x
	12 y	11 17	6 21	5 39	5 39	12 y	12 y
	13 z	11 13	6 23	5 37	5 37	13 z	13 z
	14 3	11 10	6 25	5 35	5 35	14 3	14 3
	15 4	11 6	6 27	5 33	5 33	15 4	15 4

[SEPTEMBER]

October habet dies XXXI.
Luna vero ejus 30.

Primus ciclus		Secundus ciclus		Tertius ciclus		Quartus ciclus		KL		[OCTOBER]	
Conjunctio	Oppositio	Conjunctio	[Oppositio]	Conjunctio	Oppositio	Conjunctio	[Oppositio]	Conjunctio	Oppositio	Libra	[OCTOBER]
h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
10 11 21	6 17 1	10 3 53	6 9 33	2 7 44	6 2 5	2 0 16	6 18 37	16 a	1	16	h m
18 7 31	14 5 42	18 0 3	14 22 14	10 20 25	12 14 46	10 12 57	14 7 18	16 b	2	17	h m
7 20 12	3 1 51	7 12 44	3 18 23	18 16 34	3 10 55	18 9 6	3 3 27	13 c	3	18	h m
15 16 21	11 14 32	15 8 53	11 7 4	7 5 16	11 23 36	15 17 57	11 16 8	2 d	4	19	h m
4 5 2	19 10 41	4 21 34	19 3 13	15 1 25	19 19 45	4 6 38	19 12 17	10 e	5	20	h m
12 17 43	8 2 21	8 15 54	8 15 54	4 14 6	8 8 26	12 19 19	8 0 58	18 a	6	21	h m
1 13 52	16 19 31	12 10 17	16 12 3	12 2 47	5 17 16	9 4 9	13 22 29	7 b	7	22	h m
9 2 33	5 8 12	1 6 24	5 0 44	1 22 56	16 4 35	1 15 28	5 9 58	18 a	8	23	h m
17 22 42	13 20 53	9 19 5	13 13 22	9 11 37	13 5 57	17 0 18	2 18 38	7 c	9	24	h m
6 13 23	2 17 2	17 15 14	2 9 34	17 7 46	2 2 6	6 12 59	10 7 19	15 d	10	25	h m
14 0 4	10 5 44	6 3 55	10 22 15	6 20 27	10 14 47	14 1 40	18 3 28	4 e	11	26	h m
3 20 13	18 1 53	3 12 45	18 18 25	3 5 17	7 23 38	3 21 49	18 3 28	15 e	12	27	h m
11 8 54	7 14 34	11 1 26	7 7 6	11 17 58	15 19 47	11 10 39	7 16 9	4 f	13	28	h m
19 5 3	15 10 43	19 21 35	15 3 15	19 14 7	4 8 28	19 6 39	5 12 19	12 g	14	29	h m
8 17 44	4 23 24	8 10 16	4 15 56	8 2 48	12 21 9	8 19 20	4 1 0	1 a	15	30	h m
16 13 53	12 12 5	16 6 25	12 4 37	16 22 57	1 17 18	16 15 29	12 13 41	14 a	16	31	h m
5 2 34	1 8 14	5 19 6	1 0 46	5 11 38	9 5 59	5 4 10	9 22 31	3 b	17	1	h m
13 15 15	9 20 55	9 13 27	9 13 27	13 0 19	17 2 2	13 16 51	17 18 40	9 c	18	2	h m
2 11 24	17 17 4	13 7 47	17 9 36	2 20 28	6 14 49	2 13 0	6 7 21	11 d	19	3	h m
	6 5 45	10 16 27	6 22 17	6 14 49		6 7 21		19 e	20	4	h m
								8 a	21	5	h m
								16 b	22	6	h m
								3 c	23	7	h m
								8 a	24	8	h m
								11 d	25	9	h m
								19 e	26	10	h m
								7 f	27	11	h m
								6 g	28	12	h m
								8 a	29	13	h m
								16 b	30	14	h m
								3 c	31	15	h m
								5	32	16	h m
								16 c	33	17	h m
								7 d	34	18	h m
								9	35	19	h m
								11 d	36	20	h m
								19 e	37	21	h m
								7 f	38	22	h m
								6 g	39	23	h m
								8 a	40	24	h m
								11 d	41	25	h m
								19 e	42	26	h m
								7 f	43	27	h m
								6 g	44	28	h m
								8 a	45	29	h m
								11 d	46	30	h m
								19 e	47	31	h m
								7 f	48	1	h m
								6 g	49	2	h m
								8 a	50	3	h m
								11 d	51	4	h m
								19 e	52	5	h m
								7 f	53	6	h m
								6 g	54	7	h m
								8 a	55	8	h m
								11 d	56	9	h m
								19 e	57	10	h m
								7 f	58	11	h m
								6 g	59	12	h m
								8 a	60	13	h m
								11 d	61	14	h m
								19 e	62	15	h m
								7 f	63	16	h m
								6 g	64	17	h m
								8 a	65	18	h m
								11 d	66	19	h m
								19 e	67	20	h m
								7 f	68	21	h m
								6 g	69	22	h m
								8 a	70	23	h m
								11 d	71	24	h m
								19 e	72	25	h m
								7 f	73	26	h m
								6 g	74	27	h m
								8 a	75	28	h m
								11 d	76	29	h m
								19 e	77	30	h m
								7 f	78	31	h m
								6 g	79	1	h m
								8 a	80	2	h m
								11 d	81	3	h m
								19 e	82	4	h m
								7 f	83	5	h m
								6 g	84	6	h m
								8 a	85	7	h m
								11 d	86	8	h m
								19 e	87	9	h m
								7 f	88	10	h m
								6 g	89	11	h m
								8 a	90	12	h m
								11 d	91	13	h m
								19 e	92	14	h m
								7 f	93	15	h m
								6 g	94	16	h m
								8 a	95	17	h m
								11 d	96	18	h m
								19 e	97	19	h m
								7 f	98	20	h m
								6 g	99	21	h m
								8 a	100	22	h m
								11 d	101	23	h m
								19 e	102	24	h m
								7 f	103	25	h m
								6 g	104	26	h m
								8 a	105	27	h m
								11 d	106	28	h m
								19 e	107	29	h m
								7 f	108	30	h m
								6 g	109	31	h m
								8 a	110	1	h m
								11 d	111	2	h m
								19 e	112	3	h m
								7 f	113	4	h m
								6 g	114	5	h m
								8 a	115	6	h m
								11 d	116	7	h m
								19 e	117	8	h m
								7 f	118	9	h m
								6 g	119	10	h m
								8 a	120	11	h m
								11 d	121	12	h m
								19 e	122	13	h m
								7 f	123	14	h m
								6 g	124	15	h m
								8 a	125	16	h m
								11 d	126	17	h m
								19 e	127	18	h m
								7 f	128	19	h m
								6 g	129	20	h m
								8 a	130	21	h m
								11 d	131	22	h m
								19 e	132	23	h m
								7 f	133	24	h m
								6 g	134	25	h m
								8 a</			

November habet dies XXX,
luna vero 29.

Primus ciclus		Secundus ciclus		Tertius ciclus		Quartus ciclus		KL		Littere signorum		Quantitas dierum		Ortus solis		Occasus solis	
Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	Conjunctio	[Oppositio]	Conjunctio	[Oppositio]					h	m	h	m	h	m
h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m
10 0	6 14 18 26	18 12	47 14 10 58	10 9	9 14 3 30	10 1	40 14 20 2	d	K	e	17	9	19	7	21	4	39
18 20	15 3 14 35	7 1	28 11 19 48	18 5	18 3 23 39	18 21	50 3 16 11	13	e	f	18	9	15	7	23	4	37
7 8	56 11 3 16	7 1	28 11 19 48	7 18	0 11 12 20	7 10	34 11 4 52	2	f	g	20	9	10	7	25	4	35
15 5	5 19 23 25	15 21	37 19 15 57	15 14	9 19 8 29	15 6	41 11 4 52	10	g	a	21	9	8	7	26	4	34
4 17	46 8 12 6	4 10	18 12 22 59	4 2	50 8 21 10	4 19	24 19 1 1	18	a	b	22	9	5	7	28	4	32
12 6	27 16 8 15	12 22	59 8 4 38	12 15	31 16 17 19	12 8	3 16 9 51	7	b	c	24	8	59	7	31	4	20
1 2	36 5 20 56	1 19	8 16 0 47	1 11	40 5 6 0	1 4	12 5 22 32	15	c	e	26	8	56	7	32	4	28
9 15	17 13 9 37	9 7	49 13 2 9	9 0	21 13 18 41	9 16	53 13 11 13	4	f	g	27	8	51	7	35	4	25
17 11	26 2 5 47	17 3	58 2 22 18	17 20	30 2 14 50	17 13	2 2 7 22	12	a	a	29	8	46	7	36	4	24
6 0	7 10 18 28	6 16	39 10 11 0	6 9	11 10 3 31	6 1	43 10 20 3	9	b	e	1	8	39	7	41	4	19
14 12	48 18 14 37	14 5	20 18 7 9	14 21	52 18 23 41	14 14	24 14 14 24	9	e	16	3	8	37	7	42	4	18
3 8	17 7 3 18	3 1	29 7 19 50	3 18	1 7 12 22	3 10	33 18 16 12	17	f	15	4	8	35	7	43	4	17
11 21	38 15 23 27	11 14	10 15 15 59	11 6	42 15 8 31	11 23	14 7 4 54	6	g	14	5	8	33	7	44	4	16
19 17	47 4 12 8	19 10	19 8 23 0	19 20	51 4 21 12	19 19	23 15 1 3	14	c	b	8	8	29	7	46	4	14
8 6	28 12 0 49	8 23	0 4 4 40	8 15	32 12 9 53	8 8	4 12 2 25	3	d	e	10	8	25	7	48	4	12
16 2	37 1 20 58	16 19	9 1 13 30	15 11	41 1 6 2	16 4	13 1 22 34	11	f	8	11	8	23	7	49	4	11
5 15	18 9 9 39	5 7	50 9 2 11	5 0	22 9 18 43	5 16	54 9 11 15	19	g	7	12	8	21	7	50	4	10
13 3	59 17 5 48	13 20	31 17 22 20	13 13	3 17 14 52	13 5	35 17 7 24	8	a	b	13	8	17	7	51	4	9
2 0	9 6 18 29	2 16	41 6 11 1	2 9	12 6 3 33	2 1	44 6 30 5	16	c	4	16	8	15	7	53	4	7
10 12	50 10 5 22	10 5	22 14 23 42	10 21	53 6 3 33	10 14	25 10 14 25	5	e	e	17	8	13	7	54	4	6

December habet dies XXXI,
luna vero XXX.

Primus ciclus		Secundus ciclus		Tertius ciclus		Quartus ciclus		KL		[DECEMBER]		Littere [signorum]		Quantas dierum		Ortus solis		Occasus solis	
Conjunctio	Oppositio	Conjunctio	Oppositio	Conjunctio	Oppositio	Conjunctio	Oppositio	Conjunctio	Oppositio	Conjunctio	Oppositio	h	m	h	m	h	m	h	m
18 8 59	14 7 10	18 1 31	3 19 51	18 18 3	14 16 14	18 10 35	14 8 46	13 g	4 N	18 10 35	14 8 46	18	g	8 12	7 54	4 6			
7 21 40	3 3 19	7 14 12	11 8 32	7 6 44	3 12 23	7 23 16	3 4 55	2 a	3 N	7 23 16	3 4 55	19	h	8 11	7 55	4 5			
15 17 49	11 16 0	15 10 21	19 4 41	15 2 53	11 1 4	15 19 25	11 17 36	b	2 N	15 19 25	11 17 36	21	k	8 9	7 56	4 4			
4 6 30	8 0 50	4 23 2	8 17 22	4 15 34	8 9 54	4 8 6	8 2 26	d	8 I	4 8 6	8 2 26	22	l	8 8	7 56	4 4			
12 19 11	16 20 59	12 11 43	16 13 31	12 4 15	8 9 54	12 20 47	16 22 35	e	7 I	12 20 47	8 2 26	24	n	8 7	7 57	4 3			
1 15 20	5 9 40	1 7 52	16 13 31	1 0 34	5 18 44	1 16 56	5 11 16	f	6 I	1 16 56	5 11 16	26	p	8 6	7 57	4 3			
9 4 1	13 22 21	9 10 33	5 2 12	9 13 5	13 7 25	9 5 37	3 23 57	a	4 I	9 5 37	3 23 57	27	q	8 5	7 58	4 2			
17 0 10	2 18 31	17 16 42	13 14 53	17 9 14	13 7 25	17 1 48	2 20 6	c	2 I	17 1 48	2 20 6	29	f	8 4	7 58	4 2			
6 12 51	10 7 12	6 5 23	10 23 44	6 21 55	2 3 34	6 14 27	10 8 47	d	1 I	6 14 27	10 8 47	1	t	8 4	7 58	4 2			
14 1 32	18 3 21	3 14 13	18 19 53	14 10 36	18 12 25	14 3 8	18 4 57	e	19 K	14 10 36	18 12 25	2	u	8 5	7 58	4 2			
3 21 41	7 16 4	7 8 34	7 8 34	3 6 45	7 1 6	3 22 17	18 4 57	f	18 K	3 6 45	18 4 57	3	v	8 5	7 58	4 2			
11 10 22	15 12 11	11 3 54	15 4 43	11 19 26	15 21 15	11 11 58	15 13 47	a	16 K	11 19 26	15 13 47	4	x	8 6	7 57	4 3			
19 6 31	4 0 52	8 11 44	4 17 24	8 4 16	4 9 56	8 20 48	4 2 28	b	15 K	8 4 16	4 2 28	8	z	8 8	7 56	4 4			
8 19 12	12 13 33	16 7 53	12 6 5	16 0 25	1 18 46	16 16 57	1 11 18	c	14 K	16 0 25	1 11 18	10	a	8 10	7 55	4 5			
16 15 21	1 9 43	16 7 53	1 2 14	5 13 6	9 7 27	5 5 38	9 23 59	d	13 K	5 13 6	9 23 59	11	b	8 11	7 55	4 5			
5 4 2	9 22 23	5 20 34	9 14 55	13 1 47	17 3 36	13 18 19	17 20 8	e	7 K	13 1 47	17 20 8	12	c	8 12	7 54	4 6			
13 16 44	17 18 32	13 9 15	17 11 4	2 21 57	6 16 17	2 14 28	6 8 49	f	6 K	2 21 57	6 16 17	14	e	8 14	7 53	4 7			
2 12 53	6 7 13	2 5 25	6 23 45	10 10 38	14 12 26	10 3 9	14 21 30	g	5 K	10 10 38	14 12 26	16	g	8 17	7 52	4 8			
10 1 34	14 19 54	18 18 6	14 12 26	18 6 47	14 4 58	18 23 19	18 23 19	h	4 K	18 6 47	14 4 58	17	h	8 18	7 51	4 9			
18 21 43	14 19 54	18 14 15	14 12 26	18 6 47	14 4 58	18 23 19	18 23 19	i	3 K	18 6 47	14 4 58	19	k	8 19	7 51	4 9			
								g	2 K			20		8 21	7 50	4 10			

Textual astronomical data

Jan 6	A festo Stelle numerando, perforce lunam post quadraginta dies et 70 ^a fiet et si bisestus fuerit similiter additur unus; si cadit in lucem Dei, subpone sequentem.
Jan 7	Claves 70 ^e .
Jan 18	Ante diem Prisce nunquam deponitur <i>Alleluia</i> .
Jan 26	Nota quod feria secunda post 70 ^{as} dicitur officium pro defunctis, fratris et benefactoribus.
Jan 28	Claves 40 ^e .
Feb 6	Ver incipit secundum Grecos.
Feb 13	Hic minue contra febres.
Feb 18	Hic Adam cum peno peccavit.
Feb 21	Incipit ver secundum Ysidorum.
Feb 22	Cedit hiems retro Cathedrato Simone Petro.
Feb 23	Ver secundum Ambrosium.
Feb 24	Bixestum sexste martis tenuere calende, posterioraque die celebrantur festa Mathie. Transfertur si venerit in die Cinerum.
Feb 27	Post 2 ^{am} primam computa duos dies et prima sequenti dominica est Quadragessima. Item post revolutionem lune februarii, prima dies Mercurii est dies Cinerum.
Mar 1	Nota quod numerus pacte semper mutatur prima die martii et durat usque ad alium martium.
Mar 11	Claves Pasce.
Mar 21	Post festum sancti Benedicti, ubicumque 14 luna invenitur [que tenet undenas Aprilis Luna, pacte numerum monstrant per quodlibet annum], dominica proxima celebratur Pasca.
Mar 27	Post 3 ^{am} primam computa 14 dies et prima sequenti dominica est Pasca Domini nostri Yhesu Christi.
Apr 15	Claves Rogationum.
Apr 21	[Claves Penthecostes.]
May 12	Sacramento [?] Kaesaris hic est. ⁵⁰
May 15	Nota quod 8 ^a Ascensionis est semi-duplex et 4 ^a feria post Pentecostes Quatuor Tempora celebrantur, et dominica prima fit officium Trinitatis cum 9 ^e dominice, et 5 ^a feria post Pentecostes fit Officium Corporis.
May 26	Ver fugat Urbanum, estas Symphorianum; illico quod tibi restat autumpni tempora prestart.
Jun 18	Coronatio Kaesaris hic est. ⁵¹
Jul 14	Dies caniculares.
Nov 27	Ultimo die ante dominica de Adventu fit officium pro defunctis: primam et matutinam oratio <i>Deus qui</i> .
Dec 13	Vult Crux, Lucia, Cynis et Carismata dia, ut det vota pia quarta sequens feria.
Dec 30	Hic leguntur sermones hore vel castissius quando nativitas Domini venerit 2 ^a feria.

⁵⁰ Relates probably to the coronation of Holy Roman Emperor Fredrick III in Rome on March 19th, 1452. Reading is not certain, but seems to relate to 'coronatio Kaesaris' on June 18th [*sic* for his coronation King of the Romans on June 17th, 1442].

⁵¹ See above.

*Sanctorale*⁵²

Day	Gmunden	Latin 7478
JANUARIUS		
1	Circumcisio Domini	Circumcisio Domini (duplex minus, praeceptum); Basilii episcopi et confessoris; Martine virginis martyris.
2	Octava sancti Stephani	Octava sancti Stephani (semi-duplex minus). Dicitur <i>Credo</i> in missa.
3	Octava sancti Johannis	Octava sancti Johannis (semi-duplex minus).
4	Octava sanctorum Innocentum	Octava Innocentum (semi-duplex minus). <i>Te Deum laudamus</i> dicitur.
5	Severini episcopi	Vigilia quo ad officium (semi-duplex minus). Hic non dicitur officium dominice.
6	Epyphanie Domini	Epiphania Domini (duplex majus, praeceptum).
7	Valentini episcopi	
8	Erhardi episcopi	
9	Juliani et sociorum	
10	Pauli primi hermite	Sancti Pauli primi heremite.
11		Sancti Ygini pape et martyris.
12		
13	Octava Epyphanie	Octava Epiphanie (semi-duplex minus).
14	Felicis in Pincis	Sancti Felicis in Pincis presbyteri et martyris.
15		Sancti Mauri abbatis.
16	Marcelli pape	Sancti Marcelli pape et martyris. Pro 8 ^o responsorio dicitur <i>Domin[e] prevenisti eum</i> .
17	Anthonii abbatis	Sancti Anthonii abbatis (semi-duplex minus). Non tenetur nisi in dominica.
18	Prisce virginis	Sancte Prisce virginis et martyris.
19		Sanctorum Mauri, Marthe, Audifax et Abbacuc.
20	Fabiani et Sebastiani	Sanctorum martyrum Fabiani et Sebastia[ni]. Non tenetur nisi in dominica.
21	Angnetis virginis	Sancte Agnetis virginis et martyris (semi-duplex majus). Non tenetur nisi in dominica 70 ^e .
22	Vincenti martitis	Sanctorum martyrum Vincentii et Anastasii. Non tenetur nisi in dominica.
23	Emerenciane virginis	sancte Emerentiane virginis et martyris.
24	Thymothei apostoli	
25	Conversio sancti Pauli	Conversio sancti Pauli Apostoli (duplex minus). Non tenetur nisi in dominica 70 ^e vel 60 ^e .
26	Poicarpis episcopi	

52 Many thanks to Dr Laura Albiero for her help in several readings and liturgical abbreviation deciphering. (Obviously, any remaining mistakes are my own.) This sanctorale is to be read in conjunction with the calendar on p. 165 and the additional textual data that I decided, maybe mistakenly, was not part of the sanctorale per se (see p. 177).

Day	Gmunden	Latin 7478
27	Johannis Crisotomi	Sancti Johannis Crisostimi et episcopi et confessoris. Oratio: <i>Deus venie largitor.</i>
28	Octava Angnetis	Sancte Angnetis secundo. Non tenetur nisi in dominica.
29		
30		
31	Vigili et sociarum ejus	Sanctorum martyrum Ciri et Johannis.
FEBRUARIUS		
1	Brigide virginis	Sancti Ygnatii episcopi et martyris; sancte Brigide virginis (non tenetur nisi in dominica). Pro 8 ^o responsorio dicitur <i>Domin[e] prevenisti eum.</i>
2	Purificatio Marie Virginis	Purificatio Virginis Marie (duplex majus, praeceptum). Non tenetur nisi in dominica 70 ^e vel 60 ^e vel 50 ^e .
3	Wlasii episcopi	Sancti Blasii episcopi et martyris.
4		Sancti Gilberti confessoris.
5	Agathe virginis	Sancte Agathe virginis et martyris. Non tenetur nisi in dominica 70 ^e , 60 ^e et 50 ^e .
6	Dorothee virginis	Sancte Dorothee virginis.
7		
8		
9	Appollonie virginis	Sancte Apolonie virginis et martyris. Non tenetur nisi in dominica.
10	Scolastice virginis	Sancte Scolastice virginis.
11		
12		
13		
14	Vincenti martiris	Sancti Valentini presbyteri et martyris. Obii anno Domini 280. ⁵³
15		Translatio sancti Antonii de Padua (duplex minus).
16	Juliane virginis	Sancte Juliane virginis.
17		
18		
19		
20		
21		
22	Kathedra sancti Petri	Cathedra sancti Petri (duplex minus).
23	Vigilia	Vigilia (praeceptum).
24	Mathie apostoli	Sancti Mathie apostoli (duplex minus, praeceptum). Transfertur si venerit in die cinerum.
25	Waltpurge virginis	
26		

53 Saint Valentin of Terni is supposed to have been beheaded in 269 AD.

Day	Gmunden	Latin 7478
27		
28		
MARTIUS		
1		
2		
3	Chunigundis regine	
4	Adriani martiris	
5		
6		
7	Perpetue et Felicitatis	Sancti Tome de Aquino confessoris (non tenetur nisi in dominica); sanctarum virginum Perpetue et Felicitatis.
8		
9		Sanctorum Quadraginta Martirum.
10		
11		
12	Gregorii pape	Sancti Gregorii pape et [con]fessoris (duplex minus). Dicitur in missa <i>Credo</i> .
13		
14		
15		Sancti Longini martyris.
16	Ciriaci martiris	
17	Gertrudis virginis	Sancti Patricii martyris et confessoris. Non tenetur nisi in dominica.
18		
19		Sancti Joseph confessoris. Non tenetur nisi in dominica.
20		
21	Benedicti abbatis	Sancti Benedicti abbatis et confessoris (duplex minus).
22		
23		
24		
25	Anunciatio Marie	Annuntiatio Virginis Marie (duplex majus, praeceptum).
26		
27	Ruperti episcopi	
28		
29		
30		
31		
APRILIS		
1		
2		

Day	Gmunden	Latin 7478
3		
4	Ambrosii episcopi	
5		Sancti Vincentii confessoris. Non tenetur nisi in dominica.
6		
7		
8		
9	Marie Egyptiace	
10		
11	Leonis pape	
12		
13	Eufemie virginis	
14	Tiburtii et Valeriani	Sanctorum martyrum Tiburtii, Valeriani et Maximi.
15		
16		
17		Sancti Aniceti pape et martyris.
18		
19		
20		
21		
22	Victoris pape	Sanctorum martyrum Sotheris et Georii pape et martyris.
23		Sancti Georgii martyris.
24	Geor[g]ii martitis	
25	Marci evangeliste	Sancti Marci evangeliste (duplex minus).
26	Cleti pape	Sancti Cleti et Marcelli pape et martyris.
27		
28	Vitalis martiris	Sancti Vitalis martyris.
29		Sancti Petri martyris de Ordine Predicatorum. Non tenetur nisi in dominica.
30		
MAIUS		
1	Philippi et Jacobi	Sanctorum apostolorum Philippi et Jacobi (duplex minus, praeceptum).
2	Sigismundi regis	
3	Inventio sancti Crucis	Inventio sancte Crucis (duplex minus, praeceptum); Alexandri et sociorum ejus.
4	Floriani martiris	
5	Gothardi episcopi	
6	Johannis ante portam latinam	Sancti Johannis ante portam latinam (duplex minus).
7		
8	Victoris martiris	Apparitio sancti Michaelis archangeli (semi-duplex majus). Non tenetur nisi in dominica.

Day	Gmunden	Latin 7478
9		
10	Gordiani episcopi	Sanctorum martyrum Giordani et Epimachi.
11		
12	Nerei, Achilei, Pangrati	Sanctorum martyrum Nerei et Achilei et Pancratii.
13		
14		Sancti Bonifatii martyr.
15	Sophye virginis	
16		
17		
18		
19	Potenciane virginis	Sancti Petri de Morone pape (non tenetur nisi in dominica); sancte Pote[n]tiane virginis.
20		Sancti Bernardi confessoris (duplex majus). Obiit ex ac vita 1444 an[n]o; canonicatus fuit gloriosus confessor 1450 anno.
21		
22	Helene regine	
23		
24		
25	Urbani pape	Translatio sancti Francisci (duplex majus); sancti Urbani pape martyr.
26		Sancti Eleuterii pape martyr.
27		Sancti Johannis pape et martyr.
28		
29		
30		Sancti Felicis pape et martyr.
31	Petronelle virginis	Sancte Petronille virginis.

JUNIUS

1	Nicomedis martiris	
2	Marcelli[ni] et Petri	Sanctorum martyrum Marcellini, Petri atque Herasmi.
3	Erasmi episcopi	
4		
5	Bonifacii et sociorum ejus	
6		
7		
8		
9	Primi et Feliciani	Sanctorum martyrum Primi et Feliciani.
10		
11	Barnabe apostoli	Sancti Barnabe apostoli (minus duplex).
12	Basilidis [et] Cirini	Sanctorum martyrum Basilidis, Cirini, Narboris et Nazarii.
13		Sancti Antonii confessoris (duplex majus).
14		

Day	Gmunden	Latin 7478
15	Viti et Modesti	Sanctorum martyrum Viti et Modesti atque Crescentie.
16		
17		
18	Marci et Marcelli	Sanctorum martyrum Marci et Marcelliani.
19	Gervasii [et] Prothasii	Sanctorum martyrum Gervasii et Protasii. Pro 8 ^o responsorio dicitur <i>Hec est vera</i> .
20		Octava sancti Antonii (semi-duplex minus); sancti Si[I]verii pape et martyris. Pro 8 ^o responsorio dicitur <i>Domine prevenisti</i> .
21	Albani martiris	
22	Achatii et sociorum ejus	Sancti Paulini episcopi et confessoris.
23	Vigilia	Vigilia (praeceptum).
24	Johannis Baptiste	Nativitas sancti Johannis Baptiste (duplex majus, praeceptum).
25		
26	Johannis et Pauli	Sanctorum martyrum Johannis et Pauli (non tenetur nisi in dominica). 8 ^m responsorium dicitur <i>Hec est vera fraternitas</i> .
27	Septeni dormientium	
28	Leonis pape	Sancti Leonis pape et confessoris (non tenetur nisi in dominica); Vigilia (praeceptum).
29	Petri et Pauli apostolorum	Apostolorum Petri et Pauli (majus duplex, praeceptum).
30	Commemoratio Pauli	Commemoratio sancti Pauli apostoli (duplex minus).

JULIUS

1	Octava Johannis Baptiste	Octava sancti Johannis Baptiste (semi-duplex majus).
2	Visitacio Marie	Visitatio Virginis Mari (majus duplex); sanctorum martyrum Processi et Martiniani.
3		
4	Udalrici episcopi	
5		
6	Octava Petri et Pauli	Octava apostolorum Petri et Pauli (duplex minus).
7	Wilibaldi episcopi	
8	Kiliani et sociorum ejus	
9	Translatio Nicolai	Octava Visitationis Virginis Marie (duplex minus).
10	Septem fratrum	Sanctorum martyrum 7 ^{em} fratrum et sanctarum Rufine et Secunde virginum. Pro 8 ^o responsorio <i>Hec est vera</i> .
11	Translatio Benedicti	Sancti Pii pape et martyris.
12	Margarethe virginis	Sanctorum martyrum Naboris et Felicis.
13	Hamrici regis	Sancti Anacleti pape et martyris; sancte Margarite virginis et martyris (non tenetur...).
14		

Day	Gmunden	Latin 7478
15	Divisio apostolorum	Sanctorum martyrum [C]irici et Julite.
16		
17	Allexii confessoris	Sancti Alexii confessoris.
18	Arnolphi martiris	Sanctorum martyrum Symphorose cum 7 ^{em} filiis suis. Pro 8 ^o responsorio dicitur <i>Hec est</i> .
19		
20		
21	[P]raxedis virginis	Sancte Praxedis virginis; Officium pro defunctis fratribus et benefactoribus.
22	Marie Magdalene	Sancte Marie Magdalene (semi-duplex majus). Non tenetur nisi in dominica.
23	Appollinaris martiris	Sancti Apolinaris episcopi et martyris.
24	Christine virginis	Sancte Cristine virginis et martyris; Vigilia (praeceptum).
25	Jacobi apostoli, Kristofori	Sancti Jacobi apostoli (duplex minus, praeceptum); sancti Cristofori martyri.
26	Anne matris Marie	Sancte Anne matris Virginis Marie (non tenetur nisi in dominica); sancti Pastoris presbyteri.
27		Sancti Pantaleonis martyris.
28	Panthaleonis martiris	Sanctorum martyrum Nazarii, Celsi, Victoris et Innocentii pape et martyris.
29	Felicis et sociorum ejus	Sancte Marthe virginis (non tenetur nisi in dominica); sancti Symplicii et sociorum ejus.
30	Abdon et Senne[n]	Sanctorum martirum Abdon et Senen.
31		

AUGUSTUS

1	Ad Vincula sancti Petri	Sancti Petri ad Vincula (duplex minus); sanctorum Machabeorum martyrum. Responsorium <i>Hec est</i> .
2	Stephani pape	Dedicatio Portiuncule (duplex minus); sancti Stephani pape et martyris.
3	Inventio sancti Stephani	Inventio sancti Stephani prothomartiris. Non tenetur nisi in dominica.
4	Translatio Valentini	Sancti Justini presbyteri et martyris.
5	Oswaldi regis	Festum nivis (majus duplex); sancti Dominici confessoris (non tenetur nisi in dominica).
6	Sixti pape	Sancti Systi pape et martyris; F[el]icissimi et Agapiti martyrum.
7	Afre martiris	Sancti Donati episcopi et martyris.
8	Ciriaci et sociorum ejus	Sanctorum martyrum Ciriaci, Largi et Sma[ra]gdi.
9	Romani martiris	Sancti Romani martyris; Vigilia (praeceptum).
10	Laurentii martiris	Sancti Laurentii martyris (praeceptum, majus duplex).
11	Tyburcii martiris	Sanctorum martyrum Tiburcii et Susanne. Non tenetur nisi in dominica.

Day	Gmunden	Latin 7478
12	Clare virginis	Sancte Clare virginis de Assisio (duplex majus).
13	Ypoliti et soc[i]orum ejus	Sanctorum martyrum Ipoliti et sociorum ejus.
14	Eusebii confessoris	Sancti Eusebii presbyteri et confessoris; Vigilia (praeceptum).
15	Assumptio Marie Virginis	Assumptio sancte Marie virginis (duplex majus, praeceptum).
16		
17	Octava Laurentii	Octava sancti Laurentii (semi-duplex minus).
18	Agapiti martiris	Sancti Agapiti martyr.
19		Sancti Ludovici episcopi et confessoris (duplex majus); et de octava sancte Clare fit confessio.
20	Bernhardi abbatis	Sancti Bernardi abbatis et martyr. Fit statim post 8 ^{am} Assumptionis.
21		
22	Thymothei [et] Simphoriei	Octava Assumptionis (duplex minus); sanctorum martyrum Timotei et sociorum ejus.
23	Vigilia	
24	Bartholomei apostoli	Vigilia (preceptum).
25		Sancti Bartholomei apostoli (duplex minus, fit secundum morem patrie, praeceptum).
26		Octava sancti Ludovici episcopi (semi-duplex minus); sancti Ceserini pape martyr.
27	Rufi martiris	Sancti Ludovici confessoris Regis Francie. Fit statim post 8 ^{am} Ludocivi episcopi.
28	Augustini episcopi	Sancti Augustini episcopi et confessoris; dicitur <i>Credo</i> in Missa; duplex minus; Hermetis martyr.
29	Decolatio Johannis	Decolatio sancti Johannis Baptiste (semi-duplex majus, non tenetur nisi in dominica); Sabine martyr.
30	Felicis et Audaucti	Sanctorum martyrum Felicis et Audaucti.
31		

SEPTEMBER

1	Egidii abbatis	Sanctorum martyrum 12 fratrum; pro 8 ^o responsorio dicitur <i>Hec vera fraternitas</i> ; sancti Egidii abbatis et confessoris.
2		Sancti Anthonini martyr.
3		
4		
5		
6	Magni confessoris	
7		
8	Nativitas Marie	Nativitas Virginis Marie (duplex majus, praeceptum); sancti Andriani martyr.
9	Gorgonii martiris	Sancti Gorgonii martyr.
10		Sancti Nicolai Tolentini confessoris.

Day	Gmunden	Latin 7478
11	Prothy et Jacincti	Sanctorum martyrum Prothi et Iacinti.
12		
13	Septem dormientium	
14	Exaltatio sancti Crucis	Exaltatio sancte Crucis (minus duplex, praeceptum); sanctorum Cornelli et Cypriani.
15	Nicomedis martiris	Octava Virginis Marie (semi-duplex majus); sancti Nicomedi fide martyris.
16	Eufemie virginis	Sanctorum martyrum Lucie, Germiniani et Eufemie virginis.
17	Lamperti episcopi	Stimata beati Francisci (majus duplex). Non tenetur nisi in dominica.
18		
19	Januarii et sociorum ejus	[Scraped]. ⁵⁴
20	Vigilia	Sanctorum martyrum Eustachii et sociorum ejus (non tenetur nisi in dominica); Vigilia (praeceptum).
21	Mathiei apostoli	Sancti Mathei apostoli et evangeliste (minus duplex, praeceptum). Non tenetur nisi in dominica.
22	Mauricii et sociorum ejus	Sanctorum martyrum Mauricii et sociorum ejus.
23	Tecele virginis	Sancti Lini pape et martyris.
24	Translatio Ruperti	
25		[Unreadable].
26	Translatio sancti Virgilii	[Unreadable].
27	Cosme et Damiani	[Unreadable] (semi-duplex majus, non tenetur nisi in dominica); [Unreadable].
28	Wenzeslai regis	Officium pro benefactoribus (oratio <i>Deus venie</i>); [Unreadable]. 8 ^m responsorium dicitur <i>Hec est</i> .
29	Michaelis archangeli	Dedicatio Michaelis (duplex majus, non tenetur nisi in dominica, praeceptum).
30	Jeronimi confessoris	Jeronimi presbyteris (duplex minus). Dicitur <i>Credo</i> in missa; non tenetur nisi in dominica.

OCTOBER

1	Remigii episcopi	Sancti Remigii episcopi et confessoris.
2	Leodegarii episcopi	Translatio sancte Clare virginis (duplex minus). Non tenetur nisi in dominica.
3		
4	Francisci confessoris	
5		Sancti Francisci confessoris (majus duplex). Non tenetur nisi in dominica.

⁵⁴ The scribe seems to have been correcting a one-line-shift; hence the difficulties to decipher either the scraped or the replacing text (especially in black ink).

Day	Gmunden	Latin 7478
6		
7	Sergii et Bachii martirum	Sanctorum martyrum Sergi, Bachii, Marcelli et Apulei; sancti Marci pape et confessoris.
8		
9	Dyonisii et sociorum ejus	Sanctorum martyrum Dionisii, Rusticii et Eleutherii.
10	Gereonis et sociorum ejus	Sancti Cerboni episcopi et confessoris.
11	Translatio sancti Augustini	Octava sancti Francisci (duplex minus).
12	Maximiliani episcopi	
13	Cholomanni martiris	
14	Calixti pape	Sancti Kalisti pape et martyris.
15	Hedwigis vidue	
16	Galli abbatis	
17	Marthe hospite Christi	
18	Luce ewangeliste	Sancti Luce ewangeliste (duplex minus). Non tenetur nisi in dominica.
19	Januarii et sociorum ejus	
20		
21	Undecim milium virginum	Sancte Ursule et sociarum ejus (non tenetur nisi in dominica); sancti Ilarionis abbatis et confessoris.
22	Severi episcopi	
23	Severini episcopi	
24		
25	Crispini et Crispiani	Sanctorum martyrum [Ch]risanti et Darie.
26	Amandi episcopi	Sancti Evaristi pape et martyris.
27	Vigilia	Sancti Yvonis confessoris de tertio ordine (semi-duplex majus, non tenetur nisi in dominica); Vigilia (praeceptum).
28	Symonis et Jude	Aspostolorum Symonis et Jude (duplex majus, non tenetur nisi in dominica, praeceptum).
29	Narcissi episcopi	
30		
31	Wolfgangi episcopi	Vigilia omnium sanctorum (praeceptum).

NOVEMBER

1	Omnium sanctorum	Festum omnium sancctorum (duplex majus, praeceptum); Cesarii martyris.
2	Commemoratio animarum	Commemoratio omnium fidelium defunctorum.
3		
4		Sancti Vitalis et Agricole martyrum.
5		
6	Bernhardi confessoris	Sancti Leonardi confessoris.
7		
8	Quatuor cor[o]natorum	Translatio sancti Ludovici episcopi (duplex majus); Sanctorum martyrum 4 coronatorum.

Day	Gmunden	Latin 7478
9	Theodorii martiris	Dedicatio Basilice (duplex majus); sancti Teodori martyris.
10	Martini pape	Sanctorum martyrum Triphonis, Respicii et Nymphe virginis.
11	Martini episcopi	Sancti Martini episcopi (semi-duplex majus, praeceptum); sancti Menne martyris.
12		Sancti Martini pape et martyris. Pro 8 ^m responsorium dicitur <i>Domine prevenisti eum</i> .
13	Briccii episcopi	Sancti Britii episcopi et confessoris.
14		
15		
16	Othmari abbatis	
17		
18	Octava sancti Martini	Dedicatio Basilice Petri et Pauli apostolorum (duplex majus).
19	Elysabeth vidue	Sancte Helisabet nec virginis nec martyris (semi-duplex majus, non tenetur nisi in dominica); sancti Pontiani pape et martyris. Pro 8 ^m responsorium dicitur <i>Domine prevenisti eum</i> .
20		
21		
22	Cecilie virginis	Sancte Cecilie virginis et martyris (semi-duplex minus). Non tenetur nisi in dominica.
23	Clementis pape	Sancti Clementis pape et martyris (semi-duplex minus). Non tenetur nisi in dominica.
24	Crisogoni martiris	Sancti Crisogoni martyris; sancte Felicitatis martyris.
25	Katherine virginis	Sancte Katherine virginis et martyris (semi-duplex minus). Non tenetur nisi in dominica.
26	Lini pape	Sancti Petri Alexandrini episcopi et martyris.
27	Virgilii episcopi	
28		Vigilia (praeceptum).
29	Vigilia	Sancti Saturnini martyris.
30	Andree apostoli	Sancti Andree apostoli (duplex minus, praeceptum).

DECEMBER

1		
2		Sancte Bibiane virginis et martyris.
3		
4	Barbare virginis	Sancte Barbare virginis et martyris.
5		Sancti Sabbe abbatis et confessoris.
6	Nicolai episcopi	Sancti Nicolai episcopi et confessoris (semi-duplex majus). Non tenetur nisi in dominica.

Day	Gmunden	Latin 7478
7	Octava sancti Andree	Sancti Ambrosii episcopi et confessoris (duplex minus). Non tenetur nisi in dominica.
8	Conceptio Marie	Conceptio Virginis Marie (majus duplex). Non tenetur nisi in dominica.
9		
10		
11	Damasii pape	
12		
13	Lucie et Otilie virgin[um]	Sancte Lucie virginis et martyris (semi-duplex majus).
14	Nicasii episcopi	
15		
16		
17	Ignacii episcopi	
18		
19		
20	Vigilia	Vigilia (praeceptum).
21	Thome apostoli	Sancti Thome apostoli (minus duplex, praeceptum).
22		
23		
24	Vigilia	Vigilia (praeceptum).
25	Nativitas Christi	Nativitas Domini Nostri Yhesu Christi (duplex majus, praeceptum); Anastasie martyris; Confessio in missa 2 ^a .
26	Stephani prothomartiris	Sancti Stephani prothom[arty]ris (praeceptum, duplex majus).
27	Johannis apostoli	Sancti Johannis evangeliste (praeceptum, duplex majus).
28	Sanctorum Innocentum	Sanctorum Innocentum martyrum (semi-duplex majus). <i>Te Deum laudamus</i> , praeceptum. Non dicitur nisi venerit in dominica.
29	Thome episcopi	Sancti Thome episcopi et martyris (non tenetur).
30		
31	Silvestri pape	Sancti Silvestri pape et confessoris (non tenetur nisi in dominica, praeceptum).

*Canons and ancillary tables**F. 1. Tabula 4^{or} ciclorum 19^m*

[F. 1Ds]

Primus ciclus		Secundus ciclus		Tertius ciclus		Quartus ciclus		
15	1515	15	1458	15	1477	15	1496	
16	1516	16	1459	16	1478	16	1497	
17	1517	17	1460	17	1479	17	1498	
18	1518	18	1461	18	1480	18	1499	
19	1519	19	1462	19	1481	19	1500	
1	1520	1	1463	1	1482	1	1501	
2	1521	2	1464	2	1483	2	1502	
3	1522	3	1465	3	1484	3	1503	
4	1523	4	1466	4	1485	4	1504	
5	1524	5	1467	5	1486	5	1505	
6	1525	6	1468	6	1487	6	1506	
7	1526	7	1469	7	1488	7	1507	
8	1527	8	1470	8	1489	8	1508	
9	1528	9	1471	9	1490	9	1509	
10	1529	10	1472	10	1491	10	1510	
11	1530	11	1473	11	1492	11	1511	
12	1531	12	1474	12	1493	12	1512	
13	1532	1456	13	1475	13	1494	13	1513
14	1533	1457	14	1476	14	1495	14	1514

[F. 1Di]

Ad sciendum per kalendarium sequens tempus conjunctionum et oppositionum solis cum lune: nota primo [quod] in eo posui 4^{or} ciclos conjunctionum et oppositionum, quorum quilibet ciclus continet spatium 19 annorum, et ex hiis integratur ciclus perfectus qui est spatium 76 annorum, ut patet hic super in rota in qua posui tibi predictos ciclos cum millesimo. In quarum prima ponitur aureus numerus in directo illius diei in quo fit conjunctio vel oppositio. In secunda linea ponitur numerus [horarum]. Et in tertia linea ponitur numerus minorum hore, quibus completis, fit tunc conjun[c]tio vel oppositio.

Primo ergo scias aureum numerum illius anni in quo queris, demum quere eundem aureum numerum sub ciclo conjunctionis vel oppositionis et in directo ejusdem aurei numeri, in linea dierum illius mensis in quo queris predicta, habere diem conjunctionis etc.

[F. 1A]⁵⁵

Et considera bene sub quo ciclo debes predicta querere 2^m doctrinam notabilis premium. Et nota quod si hora[e] invente fuerint pauciores quam 12, tunc conjunctio vel oppositio erit eodem die post meridiem, scilicet inter meridiem ejusdem diei et meridiem noctis sequentis, post tot horas et minuta quot sunt inposita; si vero fuerint plures hore quam 12, tunc conjunctio vel oppositio erit die sequenti de mane, ante meridiem, post tot horas et minuta a medi[o] noctis computando quot sunt hore residue cum minutis ultra duodecim horas. Nota etiam quod hora est 24^a pars diei naturalis, hoc est agregati ex die artificiali et nocte simul. Et quelibet hora dividitur in 60^a partes equales que vocantur minuta horarium. Et quodlibet minutum [dividitur] in 60^a secunda. Item nota quod quelibet hora habet mille octoginta puncta.

F. 14. Tabula signorum lune per totum annum

[F. 14D (left)]: See opposite page.

[F. 14D (right)]⁵⁶

Aries — Nil capiti facias, Aries cum luna refulget. Brachia tunc minuas et balneo tutius intras [*sic for intras*]. Non tangas aures nec barbam radere cures.

Taurus — Arbor plantetur cum luna Thaurus habebit. Edificare potes, et sperges [*sic for spergas*] semina terre. Et medicus caveat cum fero tangere collum.

Gemini — Brachia non minuas cum lucet luna Gemellis. Unguibus et manibus cum fero cura negetur.

Cancer — Pectus, pulmone, jecur non minuatur. Potio sumatur, securus perge viator. Somnia falsa vites [*sic for vides*]; est utilis emptio rerum.

Leo — Cor gravat et stomachum, cum cernit luna Leonem. Non facias vestes sed ad convivia vadas. Et nichil ore vomas, nec sumas tunc medicinas.

Virgo — Luna Virgo tenens, uxorem ducere noli. Unguento caveas. Costas curare cyrogere [*sic*]. Detur agro semen, caveas intrare carinam.

Libra — Libra tenens lunam, nemo genitalia tangat. Aut renes, nates; iter nec capere cures, extremam partem Libre cum luna tenebit.

Scorpio — Augmentat Scorpio morbos in parte pudenda. Vulnera non curas, cave ascendere navem. Et carpes iter, timeas de morte ruinam.

Sagittarius — Luna nocet femori per partes mota [*sic*] Sagitte. Unguues et crines potes prescindere [*prescindere*] tute.

Capricornus — Capra nocet genibus, ipsam cum luna tenebit. Intres aquas maris melius curabitur eger. Fundamenta ruunt, nichil est quod duret in ipsa.

Aquarius — Tangere crura cave cum luna videbit Aquosam. Insece tunc plantas [*plantas*], excelas erige turus. Ac si capis iter, ad finem tardius ibis.

Pisces — Piscis habens lunam, noli curare podagram. Carpe viam tucius, hujusmodi potio sumpta salubris.

55 This leaf's tab has been replaced and it is mounted incorrectly; compartment A can be read on the verso of the entirely unfold leaf, tab on top.

56 These verses are derived from the *Salernitan Regimen sanitatis*; compare to the critical edition in *Collection Salernitana*, pp. 486–87.

1456		Tabula 12 signorum lune per totum annum																												
Aureus numerus		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19										
Aries	< — < / — > — > — > — < / — < — > — > — > — < / — < / — > — — > — — < /	y	3	3	z	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r	f	s	t	u	v	x	y	
Taurus	< — < / — > — > — > — < / — < — > — > — > — > — < / — < / — — > — — > — — < /	p	q	r	f	s	t	u	v	x	y	3	3	z	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q
Gemini	< — < / — > — > — > — < / — < — > — > — > — > — < / — < / — — > — — > — — < /	e	f	g	h	i	k	l	m	n	o	p	q	r	f	s	t	u	v	x	y	3	3	z	a	b	c	d	e	
Cancer	< — < / — > — > — > — < / — < — > — > — > — > — < / — < / — — > — — > — — < /	h	i	k	l	m	n	o	p	q	r	f	s	t	u	v	x	y	3	3	z	a	b	c	d	e	f	g	h	
Leo	< — < / — > — > — > — < / — < — > — > — > — > — < / — < / — — > — — > — — < /	f	s	t	u	v	x	y	3	3	z	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r	f	
Virgo	< — < / — > — > — > — < / — < — > — > — > — > — < / — < / — — > — — > — — < /	z	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r	f	s	t	u	v	x	y	3	3	z	
Libra	< — < / — > — > — > — < / — < — > — > — > — > — < / — < / — — > — — > — — < /	l	m	n	o	p	q	r	f	s	t	u	v	x	y	3	3	z	a	b	c	d	e	f	g	h	i	k	l	
Scorpio	< — < / — > — > — > — < / — < — > — > — > — > — < / — < / — — > — — > — — < /	u	v	x	y	3	3	z	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r	f	s	t	u	
Sagittarius	< — < / — > — > — > — < / — < — > — > — > — > — < / — < / — — > — — > — — < /	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r	f	s	t	u	v	x	y	3	3	z	a	b	c	
Capricornus	< — < / — > — > — > — < / — < — > — > — > — > — < / — < / — — > — — > — — < /	n	o	p	q	r	f	s	t	u	v	x	y	3	3	z	a	b	c	d	e	f	g	h	i	k	l	m	n	
Aquarius	< — < / — > — > — > — < / — < — > — > — > — > — < / — < / — — > — — > — — < /	y	3	3	z	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r	f	s	t	u	v	x	y	
Pisces	< — < / — > — > — > — < / — < — > — > — > — > — < / — < / — — > — — > — — < /	3	z	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r	f	s	t	u	v	x	y	3	3	
Aureus numerus		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19										

[F. 14Di]

Si scire desideras quocumque die anni in quo signo sit luna, intra kalendarium precedens cum die mensis cum directo [*in directo*] illius diei versus dextram in linea sub qua est scriptum 'littere signorum', invenies unam litteram de litteris alphabeti quam bene considera, et ejusdem littere figuram. Demum eandem litteram et ejus [figuram] quere in tabula supra scripta signorum lune directe sub aureo numero illius anni. Descend[en]do usque illam litteram — quem aureum numerum invenies in superiori vel inferiori parte istius tabule, scilicet in prima linea superius vel inferius transversaliter posita — habita autem litera predicta directe sub aureo numero descendeda [*discendente*] inventa, tunc in directo ejusdem littere invenies a sinistris nomen signi sub quo est luna die illa aut eadem die ad minus intrabit vel exsibit [*exibit*] idem signum.

F. 15. Tabola ad inveniendum ciclum solarem et lunarem

[F. 15B]

Si vis invenire lunam cotidie, id est quot dies habet et quando facit revolutionem. Oportet tibi habere tres numeros, scilicet pactam, et menses, incipiendo a martio usque ad mensem in quo es, et dies mensis illius in quo es. Et omnes istos tres numeros pone in simul. Et vide si superat 30^a. Si vero superat 30^a, abjectis 30^a, illud quod remanet est luna quam queris. Si vero habueris 30^a vel 60^a, abjectis 30^a de 60^a, remanet 30^a: illo die est revolutio luna (30^a vel etiam 60^a non removendo 30^a a 60^a).

Si vero desideras qua hora et quo puncto luna facit revolutionem, teneas istam regulam: primo oportet te scire quo die mensis fuit revolutio lune, 4 vel 6 et cetera. Si vero fuerit 4^a divide illos 4^{or} dies per medium: prima pars, scilicet 2, sunt horae, secunda pars, scilicet que remanserunt, sunt puncta multiplicando pro quolibet uno die decem. Verbi gratia luna fecit revolutionem 4^a die mensis: divide 4^{or} per medium; prima pars, scilicet 2^o: sunt due hore; secunda pars multiplicando quolibet unum per decem, sunt puncta horarum, ergo revolutio lune fuit 4^a die mensis hora 2^a et puncta 20.

1456 25^a die 7tembris frater Paulus de Kignin.

De clavibus

Prima igitur Jan[uari]i jacet 70 [*Setpuagesime*] clavis.

Ultima igitur Jan[uari]i 40 [*Quadragesime*] inspice clavem.

Secundaque igitur Martis Pasce dat tibi clavem.

Tertia igitur Aprelis Rogationum dat tibi clavem.

Ultima igitur ejusdem Pentecostes dat tibi clavem.

Katholicus pro Sept[u]agesima Vinum pro Rogationes	Bonus pro Quadragesima	Offert pro Pasca Delicatum pro Pentecoste
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[F. 15C]

	Sol	Venus	Mercurius	Luna	Saturnus	Jupiter	Mars
Feria 1 ^a	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
Feria 2 ^a	22	23	24	1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
Feria 3 ^a	19	20	21	22	23	24	1
	2	3	4	5	6	7	8
	9	10	11	12	13	14	15
Feria 4 ^a	16	17	18	19	20	21	22
	23	24	1	2	3	4	5
	6	7	8	9	10	11	12
Feria 5 ^a	13	14	15	16	17	18	19
	20	21	22	23	24	1	2
	3	4	5	6	7	8	9
Feria 6 ^a	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	1	2	3	4	5	6
Feria 7 ^a	2	3	4	5	6	7	8
	14	15	16	17	18	19	20
	21	22	23	24	1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24

Si vis scire dominationem planetarum in omni hora: Accipe quadrantem et mitte intrare per ambo, foramina radium solis posita primo margarita super diem mensis, 1 si est prima die vel 2^a, 3 vel 4^a aut 20^a et quota die aut feria. Dabit tibi certitudinem quam tu petis. Ex hoc apparebit quis planetarum regnat in qualibet hora. Nam in prima hora diei dominice regnat sol, in 2^a Venus, in 3^a Mercurius, et cetera. Et sic fac de aliis diebus sicut de die dicto fecisti.

Vale in Domino.

[F. 15D]

	Aureus					
	Numerus	Claves	Pacta			
1456	13	14	23	1456	d	c
1457	14	33	4	1457	b	
1458	15	22	15	1458	a	
1459	16	11	26	1459	g	
1460	17	30	7	1460	f	e
1461	18	19	18	1461	d	
1462	19	38	29	1462	c	
1463	1	26	11	1463	b	
1464	2	15	22	1464	a	g
1465	3	34	3	1465	f	
1466	4	23	14	1466	e	
1467	5	12	26	1467	d	
1468	6	31	6	1468	c	b
1469	7	20	17	1469	a	
1470	8	39	28	1470	g	
1471	9	28	9	1471	f	
1472	10	17	20	1472	e	d
1473	11	36	1	1473	c	
1474	12	25	12	1474	b	
– Pacta				1475	a	
– Menses incipiendo a Martio semper				1476	g	f
– Dies mensis				1477	e	
				1478	d	
				1479	c	
				1480	b	a
				1481	g	
				1482	f	
				1483	e	

Queras in hac rota aureum numerum, claves terminorum et pactam ab annis Domini 1456 ut aparet hic supra in paragrafis positus.

Et semper ab ip[s]is numeris inclusive pro quolibet anno unum numerum computa pro tempore futuro, pro preterito vero retrogradando. Et ubi terminatur ultimus annus, ibi sunt supra dicti numeri. Ante vel retro numerabis.

Et sic faciendo nu[n]quam herabis.

Item habes in qualibet casella milessimum ut posis melius atque citius quod cupis invenire. Amen.

Queras in hac rota litteram dominicalem ab annis Domini 1456, in quibus annis curebant littere dominicales d et c, ut patet supra in paragrafo. Et ab ipsis litteris pro quolibet anno unam litteram computa pro tempore futuro — pro preterito vero retrogradando — et habebis litteram dominicalem.

Quod si annus bixestus erit, duas litteras dominicales habebit. Quarum altera scilicet in majori circulo erit dominicalis a Januario usque ad festum sancti Matthe apostoli [24/02]. Reliqua vero per residuum anni.

Item posui tibi milessium in qualibet cassella ut citius et levius posis invenire.



Figure 7. Paris, BnF, Latin 7478, f. 15R (folded). Source gallica.bnf.fr.

[F. 15R]⁵⁷

Idem quando est bixestus cuilibet clavi debes adibere unitatem querendo festa mobilia: si cadit in luce Domini supone sequentem.

Pro Pacta: quando vis inuenire pactam, numera aureum numerum illius anni per istas 3 juncturas policis, et ubi terminatur ultimus annus [sic for numerus?] [...] pone insimul illos extremos numeros [?]. Si superat 30^a, abjectis 30^a illud quod remanet est pacta.

57 On this compartment, Paulus of Kignin has drawn two hands with the numerical value associated with each joint and digit. Paragraphs beginning with *Pro Pacta...* and *Item si vis inuenire...* are respectively written over these drawings, that I am omitting here (compare to Fig. 7).

Item si vis invenire claves allicujus anni, numera aureum numerum per quinque digitos et ubi terminatur aureus numerus pone insimul cum numero in digito pisito [*sic*]: si erunt 40^a, abjectis 30^a, qui remanet sunt claves illius anni.

F. 16. Tabula ad inveniendum festa mobilia et ebdomadas

[F. 16D]

See table on opposite page.

Nota quod pacta, claves terminorum et littera martilogi vel dactarii, isti tres numeri semper sunt in linea ubi est aureus numerus, ut pate[t] hic supra scriptum.

Omnia festa mobilia et ebdomadas cum diebus superfluis invenies super litteram dominicalem primam post aureum numerum. Et si dictus aureus numerus cadit super litteram dominicalem, accipe dominica[le]m sequentem et in linea illius littere omnia festa mobilia et ebdomadas reperies pro illo anno in quo queris, etc.

F. 17. [Earthly and heavenly spheres]

Compare this transcription with the reproduction in Fig. 3a.

[Heavenly spheres]

Saturnus facit cursum suum in triginta annis.

Jupiter complet cursum suum in duodecim annis.

Mars complet cursum suum in 2 annis.

Sol facit cursum suum in tres centis sessaginta quinque diebus et sex horis, et ex istis horis fit bixestus.

Venus complet cursum in uno [anno] minus 17 diebus.

Mercurius complet cursum suum in uno anno minus quadraginta diebus.

[Luna] complet cursum suum in viginti octo diebus et congiungit se soli.

Ignis

Aer

Aqua

Terra

[Mappemond]

Teoria (?)

Francia

Italia

Spania (?)

Polonia

Ungaria

Scla[via]

Alba

Tartaria

Caucasia

Turchia

Tunisi

Barbaris

Egyptus

Etiopia

Arabia

India

Numerus pacle	Claves terminorum	Littera martilogii	Aureus numerus	[Littera dominicalis]	Septuagesima	Carnis privium	Prima dominica In 40 ^a	Pascha Domini Yhesu Christi	Ascensio Domini	Pentecostes	Trinitas	Festum corporis Christi	Dominice inter 8 ^{im} Pentecostis et Adventum	Inter Nativitatem et 7 ^{im} ebdomade	Inter Nativitatem et Pascam	Inter Nativitatem et Pentecostem	Quando est Adventus et de quo mense, nota hic inferus	Ab Adventu usque ad Nativitatem	
26	11	Q	16	d	Jan. 18	Feb. 3	Feb. 8	Mar. 23	Apr. 30	Mai. 10	Mai. 17	Mai. 21	Ebd. 28	Ebd. 3	Ebd. 12	Ebd. 19	Adventus 29	Ebd. 3	Dies 5
25	12	E	5	e	Jan. 19	Feb. 4	Feb. 9	Mar. 22	Apr. Mai. 1	Mai. 11	Mai. 18	Mai. 22	Ebd. 28	Ebd. 3	Ebd. 12	Ebd. 19	Adventus 30	Ebd. 3	Dies 4
23	14	N	13	f	Jan. 20	Feb. 5	Feb. 10	Mar. 24	Apr. 2	Mai. 12	Mai. 19	Mai. 23	Ebd. 28	Ebd. 3	Ebd. 12	Ebd. 19	Adventus 1	Ebd. 3	Dies 3
22	15	B	2	g	Jan. 21	Feb. 6	Feb. 11	Mar. 25	Apr. 3	Mai. 13	Mai. 20	Mai. 24	Ebd. 28	Ebd. 3	Ebd. 12	Ebd. 19	Adventus 2	Ebd. 3	Dies 2
20	17	K	10	a	Jan. 22	Feb. 7	Feb. 12	Mar. 26	Apr. 4	Mai. 14	Mai. 21	Mai. 25	Ebd. 27	Ebd. 4	Ebd. 13	Ebd. 20	Adventus 3	Ebd. 3	Dies 1
18	19	S	18	b	Jan. 23	Feb. 8	Feb. 13	Mar. 27	Apr. 5	Mai. 15	Mai. 22	Mai. 26	Ebd. 27	Ebd. 4	Ebd. 13	Ebd. 20	Adventus 4	Ebd. 3	Dies 0
17	20	G	7	c	Jan. 24	Feb. 9	Feb. 14	Mar. 28	Apr. 6	Mai. 16	Mai. 23	Mai. 27	Ebd. 27	Ebd. 4	Ebd. 13	Ebd. 20	Adventus 28	Ebd. 3	Dies 6
15	22	P	15	d	Jan. 25	Feb. 10	Feb. 15	Mar. 29	Apr. 7	Mai. 17	Mai. 24	Mai. 28	Ebd. 27	Ebd. 4	Ebd. 13	Ebd. 20	Adventus 29	Ebd. 3	Dies 5
14	23	D	4	e	Jan. 26	Feb. 11	Feb. 16	Mar. 30	Apr. 8	Mai. 18	Mai. 25	Mai. 29	Ebd. 27	Ebd. 4	Ebd. 13	Ebd. 20	Adventus 30	Ebd. 3	Dies 4
12	25	M	12	f	Jan. 27	Feb. 12	Feb. 17	Mar. 31	Apr. 9	Mai. 19	Mai. 26	Jun. 1	Ebd. 27	Ebd. 4	Ebd. 13	Ebd. 20	Adventus 1	Ebd. 3	Dies 3
11	26	A	1	g	Jan. 28	Feb. 13	Feb. 18	Apr. 1	Apr. 10	Mai. 20	Mai. 27	Jun. 1	Ebd. 27	Ebd. 4	Ebd. 13	Ebd. 20	Adventus 2	Ebd. 3	Dies 2
9	28	I	9	a	Jan. 30	Feb. 15	Feb. 20	Mar. 3	Apr. 12	Mai. 22	Mai. 29	Jun. 2	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 3	Ebd. 3	Dies 1
7	30	R	17	b	Jan. 31	Feb. 16	Feb. 21	Mar. 4	Apr. 13	Mai. 23	Mai. 30	Jun. 3	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 28	Ebd. 3	Dies 0
6	31	F	6	c	Feb. 1	Feb. 17	Feb. 22	Mar. 5	Apr. 14	Mai. 24	Jun. 1	Jun. 4	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 29	Ebd. 3	Dies 6
4	33	O	14	d	Feb. 2	Feb. 18	Feb. 23	Mar. 6	Apr. 15	Mai. 25	Jun. 2	Jun. 5	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 30	Ebd. 3	Dies 5
3	34	C	3	e	Feb. 3	Feb. 19	Feb. 24	Mar. 7	Apr. 16	Mai. 26	Jun. 3	Jun. 6	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 1	Ebd. 3	Dies 4
1	36	L	11	f	Feb. 4	Feb. 20	Feb. 25	Mar. 8	Apr. 17	Mai. 27	Jun. 4	Jun. 7	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 2	Ebd. 3	Dies 3
29	38	T	19	a	Feb. 5	Feb. 21	Feb. 26	Mar. 9	Apr. 18	Mai. 28	Jun. 5	Jun. 8	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 3	Ebd. 3	Dies 2
28	39	H	8	b	Feb. 6	Feb. 22	Feb. 27	Mar. 10	Apr. 19	Mai. 29	Jun. 6	Jun. 9	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 28	Ebd. 3	Dies 1
				c	Feb. 7	Feb. 23	Feb. 28	Mar. 11	Apr. 20	Mai. 30	Jun. 7	Jun. 10	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 29	Ebd. 3	Dies 0
				d	Feb. 8	Feb. 24	Feb. 29	Mar. 12	Apr. 21	Mai. 31	Jun. 8	Jun. 11	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 30	Ebd. 3	Dies 6
				e	Feb. 9	Feb. 25	Mar. 1	Mar. 13	Apr. 22	Jun. 1	Jun. 9	Jun. 12	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 28	Ebd. 3	Dies 5
				f	Feb. 10	Feb. 26	Mar. 2	Mar. 14	Apr. 23	Jun. 2	Jun. 10	Jun. 13	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 29	Ebd. 3	Dies 4
				g	Feb. 11	Feb. 27	Mar. 3	Mar. 15	Apr. 24	Jun. 3	Jun. 11	Jun. 14	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 30	Ebd. 3	Dies 3
				a	Feb. 12	Feb. 28	Mar. 4	Mar. 16	Apr. 25	Jun. 4	Jun. 12	Jun. 15	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 1	Ebd. 3	Dies 2
				b	Feb. 13	Mar. 1	Mar. 5	Mar. 17	Apr. 26	Jun. 5	Jun. 13	Jun. 16	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 2	Ebd. 3	Dies 1
				c	Feb. 14	Mar. 2	Mar. 6	Mar. 18	Apr. 27	Jun. 6	Jun. 14	Jun. 17	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 28	Ebd. 3	Dies 0
				d	Feb. 15	Mar. 3	Mar. 7	Mar. 19	Apr. 28	Jun. 7	Jun. 15	Jun. 18	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 29	Ebd. 3	Dies 6
				e	Feb. 16	Mar. 4	Mar. 8	Mar. 20	Apr. 29	Jun. 8	Jun. 16	Jun. 19	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 30	Ebd. 3	Dies 5
				f	Feb. 17	Mar. 5	Mar. 9	Mar. 21	Apr. 30	Jun. 9	Jun. 17	Jun. 20	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 1	Ebd. 3	Dies 4
				g	Feb. 18	Mar. 6	Mar. 10	Mar. 22	May. 1	Jun. 10	Jun. 18	Jun. 21	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 2	Ebd. 3	Dies 3
				a	Feb. 19	Mar. 7	Mar. 11	Mar. 23	May. 2	Jun. 11	Jun. 19	Jun. 22	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 28	Ebd. 3	Dies 2
				b	Feb. 20	Mar. 8	Mar. 12	Mar. 24	May. 3	Jun. 12	Jun. 20	Jun. 23	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 29	Ebd. 3	Dies 1
				c	Feb. 21	Mar. 9	Mar. 13	Mar. 25	May. 4	Jun. 13	Jun. 21	Jun. 24	Ebd. 26	Ebd. 5	Ebd. 14	Ebd. 21	Adventus 30	Ebd. 3	Dies 0