

John of Murs and Firmin of Beauval's Letter and Treatise on Calendar Reform for Clement VI

Text and Introduction

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On 25 September 1344, Pope Clement VI wrote to the astronomers John of Murs and Firmin of Beauval, asking them to come to Avignon to reform the calendar.¹ The Julian calendar in fact remained uncorrected until the reform of Gregory XIII in 1582, but the product of the first papal initiative on calendar reform is the text edited and presented below.

The Church calculates the date of Easter and other mobile holidays using a combination of the lunar and the solar calendars, but for two reasons the medieval calendar was in need of reform by the fourteenth century. First, the solar year, the time it takes to get from one spring equinox to the next, is some minutes less than the 365.25 days of the Julian calendar. Second, the ancient Metonic cycle of 235 lunar months does not exactly equal 19 solar years. These discrepancies helped make the calendar a source of much discussion in the Middle Ages, especially concerning the date of Easter. Tradition held that the Resurrection occurred at a certain point in the lunar month of Nisan during the Jewish springtime festival of Passover, the date of which was determined by the lunar calendar in conjunction with the vernal equinox. Hence, Easter was established as the Sunday following the fourteenth day of the lunar month whose fourteenth day falls on or just after the vernal equinox. The equinox, however, had already drifted from 24/25 March in 46 BC, the time of the Julian Reform, to 21/22 March by the time the rule was solidified at the Council of Nicaea in the fourth century. Moreover, already in the eighth century the Venerable Bede noticed that the full moons were occurring before the dates predicted by the cycles.

Using observational data from Ptolemy and later Arab sources, westerners slowly came up with more accurate figures first, for the number of years it took for the vernal new moon to lag one day from the predicted time in the cycles, and later, for the number of years it took for the vernal equinox to occur one day earlier than 'predicted' by the calendar. For example, by finding the date of the vernal equinox in year X, seeing the difference in days between that date and the date of the present equinox, then dividing that difference

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¹ The various letters to the astronomers and their ecclesiastical superiors are reproduced in E. Déprez, *Clément VI (1342-1352) lettres closes, patentes et curiales I, deuxième fascicule* (Paris 1925), #1134 (col. 209), #1139 (col. 211), and #1140 (col. 212).

into the number of years that had passed since year X, one would arrive at the proper figure for the Julian calendar's lag time.

In this way such thirteenth-century scholars as Conrad of Strasbourg, Robert Grosseteste, John of Sacrobosco, Vincent of Beauvais, Boni de Lucca, and Campanus de Novara derived fairly accurate figures for the inaccuracies of the Julian calendar and Metonic cycle. With Roger Bacon we find the first instance of papal involvement in the reform discussion, when he addressed his *Opus maius*, including material on calendar reform, to Clement IV in 1266. Bacon suggested a day be removed from the solar calendar every 125 years.²

Until the time of Bacon, the best astronomical tables available to the reformers were the *Tables of Toledo*. The *Toulousan Tables* were also used, but were slightly less accurate. By the 1320's at the latest, however, the *Alphon-sine Tables*, named after King Alfonso X of Castile, were in final form and in use at Paris, where their superiority was being recognized (by John of Murs, for one; cf. l. 100), enabling reformers to make more accurate calculations. Nevertheless, even without these new tables, the reformers of the thirteenth century were able to make reform suggestions that were not very different mathematically from those carried out by Gregory XIII much later.

As the Benedictine Pierre Roger, Clement VI had been both a master of theology and canon lawyer at Paris, and is well-known for his scientific interests, especially his connections to medicine and astrology. Direct and indirect contacts in Avignon with the Provençal Jew Levi ben Gerson and the Byzantine Nicephoros Gregoras, both of whom had calendrical interests, may have been stimuli for Clement's initiative,³ but Clement probably became aware of the need for calendar reform during his studies at Paris. There Clement had access to the works of the Bacon and Grosseteste, and personally to astronomers who concerned themselves with calendrical issues. Geoffrey of Meaux, John of Saxony, and John of Linieres were at Paris in the early part of the century. The last of these was interested in the reform issue, although his attachment to the work on calendar reform addressed to Clement in 1345 is

² On Calendar reform generally, see F. Kaltenbrunner, *Die Vorgeschichte der Gregorianischen Kalenderreform* (Vienna 1876); M. Welborn, "Calendar Reform in the Thirteenth Century" (Unpublished Ph.D. Dissertation, University of Chicago 1935); and the various chapters of C.V. Coyne, M.A. Hoskin, and O. Pedersen, eds., *Gregorian Reform of the Calendar: Proceedings of the Vatican Conference to Commemorate its 400th Anniversary (1582-1982)* (Vatican City 1983). For the newer literature and basic history of calendar reform up to the early thirteenth century, see J. Moreton, "Before Grosseteste: Roger of Hereford and Calendar Reform in Eleventh- and Twelfth-Century England," *ISIS* 86:4 (December 1995), 562-86. For the involvement of John of Murs, Firmin of Beauval, and Clement VI, see Kaltenbrunner, *Vorgeschichte*, 29-35; Eugene Déprez, "Une tentative de réforme du calendrier sous Clément VI: Jean de Murs et la Chronique de Jean de Venette," *Mélanges d'archéologie et d'histoire* 19 (1899), 131-43; V. Berlière, "La reform du calendrier sous Clément VI," *Revue Benedictine* 25 (1908), 240-41; P. Duhem, *Le système du monde* IV (Paris 1916), 52-57; and L. Thorndike, *A History of Magic and Experimental Science* III (New York 1934), 268-70.

³ On Levi's calendrical activities, see e.g. B. Goldstein, *The Astronomical Tables of Levi ben Gerson* (New Haven 1974), 19-24. On Gregoras' possible involvement in Clement's initiative, see G. Sarton, *Introduction to the History of Science III: Science and Learning in the Fourteenth Century* (Baltimore 1947), 951.

based on a scribal error, 'Linieres' written instead of 'Murs' in some manuscripts.⁴ Geoffrey, still using the tables of Toledo, which he deemed better than the Alphonsine ones, proposed a plan for the correction of the golden number of the lunar calendar in his *Calendrier* of 1320.⁵

The most likely candidate for Clement VI's impetus is John of Murs himself, among the greatest scholars in the Arts Faculty at Paris, known for his work not only in astronomy, but also in mathematics and music. By 1344, John had been deeply involved with calendar reform for over twenty-five years.⁶ In 1317, when Clement was a scholar in the Parisian Faculty of Theology, John wrote a critique of the calendar, in which he seemed to be concerned only with the date of Easter and the lunar calendar. Then came the *Patefit*, mostly about tables of conjunctions and oppositions of the sun and moon, and probably written in the early 1320's.⁷ John's next discussion of the calendar, *De regulis computistarum*, (probably of 1337⁸), is mostly a sarcastic polemic against ignorant computists and colleagues.⁹ Nevertheless, this work also offers remedies for the solar calendar, such as eliminating the 'leap-year' bissextile day for forty years, or shortening eleven months of any one year by one day each.¹⁰

The reason Clement wrote also to Firmin of Beauval, however, is more obscure, but he was known for his meteorological work *De mutatione aeris*.¹¹ The answer may be found in an anonymous text found by Joel Plassard (in two known manuscripts, one copied from the other), which he calls the *Pre-rapport*, probably written not long before the letters to Firmin of Beauval and John of Murs on 25 September 1344. This work is probably Firmin and John's. The *Pre-rapport* discusses in a non-technical fashion the possible ways, and the advantages and disadvantages, of removing days from the calendar to bring the equinoxes back into place.¹² If this is Firmin and John's, and if we may assume not only that at the time of its writing they were both in Paris, but also that it was addressed to the pope before the pope's letters to them, then it would go a long way in explaining the pope's initiative. Moreover, we could understand also why Firmin was chosen and why Clement's letters concerned only the reform of the golden number and the lunar reform, since the solar calendar had already been touched upon in the *Pre-rapport*.

⁴ Cf. below the *apparatus criticus*, lines 3 and 7. Clement's letters are addressed to John of Murs (cf. n. 1 above).

⁵ J. Plassard, "Projets de reforme du calendrier à Paris au debut du XIVe siècle," *Ecole des chartes, positions des thèses* (Paris 1975), 177.

⁶ On John of Murs' astronomy generally, see Duhem, *Le système du monde* IV, 30-60; Thorndike, *A History of Magic* III, 294-324; and E. Poulle, "Jean de Murs," *Dictionary of Scientific Biography* VII (1970), 128a-133b.

⁷ Cf. Plassard, "Projets de reforme," 177.

⁸ E. Poulle, "Jean de Murs," 131.

⁹ Plassard, "Projets de Reforme," 177.

¹⁰ Poulle, "Jean de Murs," 130-131. The first suggestion is that of Sacrobosco as well.

¹¹ On Firmin, see Thorndike, *A History of Magic* III, 268-80.

¹² Plassard, "Projets de reforme," 178.

John and Firmin left for Avignon near the end of 1344 to attend the conference convoked under the auspices of Clement VI, but apparently no action was taken. Under Clement's orders, however, and with the direction of Cardinal Bernard of Rodez (cf. ll. 18-23), the astronomers wrote and addressed to Clement a treatise on calendar reform in 1345 (ll. 550-553).

Written as it was to a non-astronomer, the work explains the technical aspects of the problem as simply as possible, and thus makes a good introduction to the study of the medieval calendar. The treatise is arranged as follows: first there is a letter of introduction to the pope (ll. 1-27), then a short preamble describing the four parts of the work (ll. 28-46), followed by the four parts themselves (ll. 47-488). Finally there is a brief summary or 'user's manual', in all manuscripts (ll. 489-560). There is some question as to whether the user's manual is an integral part of the treatise or was added later. There is an indication that it was written separately, because the pronoun *mihi* is used once (l. 504), instead of the usual first person plural as in the main text. In addition, the author(s) of the summary refers to "the little book on the correction of the golden number that we put together (*ordinavimus*) under the orders of our lord, Pope Clement VI, in 1345 in the city of Avignon" (ll. 550-553). This suggests that the main work was written in Avignon, and the summary added later, perhaps in Paris, by only one of the authors. Finally, the user's manual appears to require more frequent emendation (ll. 496, 521-522, 531, and 260).

In the preamble of the treatise itself the authors describe the four parts of the work. The first concerns the true length of the solar year and its length according to the calculations of different peoples; what the degree of imprecision in the length of year used by the Church is; how it can be fixed; and what the advantages and disadvantages of the correction are. The second part concerns the lunar calendar; why the golden number has been created; how the golden number is defective; and the advantages and disadvantages of its correction. In the third part Firmin and John present ways of correcting the golden number, and the advantages and disadvantages of such methods. The fourth part shows why Easter should be celebrated on a particular date.

Thus, three out of four parts of the treatise pertain to the lunar calendar and the dating of Easter, theological and ecclesio-political considerations primarily. In fact, since Clement VI had made no mention of the reform of the solar calendar in his letter, but spoke only of the problems with the golden number, used in the dating of Easter, it appears the treatment of the solar calendar was inserted purely on the two astronomers' initiative (cf. ll. 116-119).

Indeed, the quotation above from the user's manual indicates that the author(s) referred to the treatise as "a little book on the golden number." Two of the four parts of the work specifically involve the golden number, which is the number of the current year inside the 19-year Metonic cycle, found as the remainder when the year AD is increased by one and divided by nineteen (the

remainder "zero" being replaced by nineteen).¹³ John and Firmin give the common claims that unless the defect of the golden number is corrected in the Church, great absurdities will follow (cf. ll. 225-263): the Church will issue false proclamations about the state of the moon and the masses will murmur, not without reason, because this will continually worsen; the Church will announce the new moon noticeably after it actually occurs; there will eventually come a time when the moon will obviously be full, but when the Church proclaims it to be a new moon, at which time everyone will be aware of the discrepancy. It would be hard to persuade heretics or people of other religions to come to the orthodox Catholic faith, when the Church cannot even figure out the state of the moon. Moreover, the way Easter is now being observed, they say, goes against the rules specified in the Old and New Testaments, on account of which the Jews or infidels could laugh at them.

Another serious problem with the defect involved the miraculous, three hour, pan-cosmic solar eclipse during Christ's passion, miraculous because the moon is not large enough to eclipse the sun universally over the Earth, nor is a three-hour eclipse possible. It was also impossible to have an eclipse at that time since it was during or near a full moon, and the sun and moon were on opposite sides of the Earth. If the golden number is allowed to wander further from the truth, however, eventually an eclipse will be possible on Easter, on account of which the other miraculous aspects of the eclipse will be called into question, and the Church Fathers will look ignorant or negligent (cf. ll. 264-284).

On the other hand, there are religious problems if one *does* reform the calendar (cf. ll. 357-366). Schismatic Christians who celebrate Christmas and the other fixed holidays on the same day as the Roman Church would wonder, seeing the Church vary without reason, and this would only worsen the situation (perhaps in 1582 schismatic sects were too far gone to hinder reform).

The suggestions of John of Murs and Firmin of Beauval concerning the reform of the solar and lunar calendar were not implemented, probably because Clement was too busy with other matters. In addition, the Black Death may have made plans for the next nine thousand years seem unnecessary. John and Firmin's suggestions for reform, however, are reasonable, and presented very clearly. Interestingly, the authors are convinced that more recent astronomers should, in this case, be believed more than the ancients, because later men had at their disposition observations over a longer period of time, and thus were able to see small imprecisions by their accumulation (cf. ll. 67-70). This seems to be an early instance of scholars saying it was possible that they knew better than the ancients. Indeed the authors' calculations for both the solar and lunar calendars are almost exactly those used in the Gregorian Reform in 1582, so the reform could have been accomplished just as well astronomically in 1345 (cf. ll. 99-102, 220-222).

¹³ Cf. O. Pedersen, "Glossary of Technical Terms," in *Gregorian Reform of the Calendar*, 300.

Moreover, as Duhem points out, it could have had more immediate and widespread acceptance than in 1582, when many states had ceased to be Catholic¹⁴. As it was, it took several more centuries for universal acceptance.

The Edition

The edition has been prepared entirely from microfilms,¹⁵ and is based on the six manuscripts known to survive:

P = Paris, Bibliothèque Nationale, lat. 15104.¹⁶ Parchment, 22-23 x 13,5 cm., 14th c., from St. Victor, ff. 147. The manuscript includes a variety of materials assembled from different manuscripts, mostly astrological writings, including a prognostication attributed to Firmin of Beauval on 112r-v. The present text is on 114v-121v, one column per side. The columns are from 39 to 45 lines long.

X = Oxford, Bodleian Library, Can. Misc. 248.¹⁷ Parchment, 36 x 23,5 cm., 14th c., ff. 45. The manuscript contains various medieval documents relating to the Kingdom of Sicily in a post-medieval hand (ff. 1r-27r), then some astrological works and astronomical tables in 14th c. hands. The present text is in on 23ra-27ra, each side having two columns of mostly 56 lines each.

A = Vienna, Österreichische Nationalbibliothek (ÖNB), Palat. lat. 5292.¹⁸ Paper, 15th c., ff. 313. 5292 contains many geometrical and astronomical works, including (ff. 199r-209v), slightly before the present text, John of Murs' calendrical work of 1317, then (ff. 210-217v) the *Pre-rapport* of John and Firmin. The present text is on ff. 221r-229v, one column per side, roughly 30-32 lines per column. This text is closely followed by (ff. 231r-242v) John of Thermes' *Tractatus de tempore celebrationis Paschalis* for Pope Innocent IV.

B = Vienna, ÖNB, Palat. lat. 5266.¹⁹ Parchment and paper, 15th c., ff. 284. The manuscript contains many astronomical, astrological, and geographical works, especially by Pierre d'Ailly and Ptolemy. The two works preceding the present text concern the calendar: d'Ailly's *Exhortatio ad concilium generale Constantiense super Kalendarii correctione* (ff. 68v-72r), and a *Diploma aliquod pontificium quo terminus Paschalis praefigitur, donec finito schismate*

¹⁴ P. Duhem, *Le système du monde* IV, 57.

¹⁵ I thank the Hill Monastic Manuscript Library at St. John's University, Collegeville, Minnesota, for microfilms of the Vienna manuscripts, and the Österreichische Nationalbibliothek, the Bodleian Library at Oxford University, and the Bibliothèque Nationale in Paris. In addition, I thank Chris Africa and the I.L.L. people at the University of Iowa.

¹⁶ The manuscript has been described in part in Fritz S. Pedersen ed., *Petri Philomenae de Dacia et Petri de S. Audomaro Opera Quadrivialia* (Copenhagen 1983), 288. Cf. Duhem, *Le système du monde* IV, p. 52, n.2, and Thorndike, *A History of Magic* III, 269, n. 3.

¹⁷ Cf. the partial description in F. S. Pedersen ed., *Opera Petri Philomenae*, 260.

¹⁸ The manuscript is catalogued in *Tabulae Codicum...*, vol. IV (Vienna 1870), 88-89.

¹⁹ The manuscript is catalogued in *Tabulae Codicum*, vol. IV, 79-80, and described in Kaltenbrunner, *Die Vorgeschichte*, 30, n. 1.

de kalendarii correctione agatur (f. 72r-v). The present text is on ff. 73r-77v, with two columns per side. The columns are between 51 and 58 lines long. Near the end are (ff. 273r-283r) Nicholas of Cusa's *De emendatione kalendarii* and (ff. 283v-284r) another *Tractatus de emendatione kalendarii*. Judging from the contents, the manuscript was put together just before 1450.

C = Vienna, ÖNB, Palat. lat. 5273.²⁰ Paper, 16th c., ff. 355. The manuscript contains various scientific works, mostly astronomical, including (ff. 91r-102r) John's *De kalendario eiusque correctione ad observantiam termini Paschalis* of 1317, and (ff. 102v-109v) the *Pre-rapport* of John and Firmin, here called *Opusculum de kalendario corrigendo*, before the present text, which is on ff. 111v-122r. The text has one column per side, and each column has roughly 32-37 lines. This text is followed by the John of Thermes work contained in A.

D = Vienna, ÖNB, Palat. lat. 3162.²¹ Paper, 15th c., ff. 241. The manuscript contains cosmological, astronomical, meteorological, and other works, including d'Ailly's *Exhortatio* contained in B. The present text is on ff. 210va-219va. The tabulae and rotulae are omitted, but spaces are left for them, so that, for example, all of folio 215 and most of 219v are blank. The text has two columns per side, between 34 and 36 lines per column.

P and X are the oldest manuscripts. P and X belong to one family and the Vienna mss., that is ABCD, to another. P was corrected (see below), but before P's corrections P and X have 15 shared variants against the text, including two major omissions at ll. 281-283 and 330-331; some of these variants remain after P's corrections. The reading of ABCD differs from the text's on over 30 occasions.

C apparently copies A in the text of John's critique of 1317 and of John and Firmin's *Pre-rapport*.²² This also appears to be the case with the present text. A and C have about 30 common variants, and C has over 30 singular readings, including one omission of 17 words at ll. 316-317. A has only four single variants, however, and in each case C might easily have corrected A: l. 96 in] a A; and l. 470 ad] a A (the two other variants, at ll. 97 and 361, seem insignificant). In addition, in six instances A and C have omissions in common whereas A makes corrections above the line or in the margin (probably from its exemplar), while C either maintains the omission or also corrects. The one oddity is in ll. 200-201, where ABD have a nine word omission. C has some text here, but it disagrees with PX and it could be a spontaneous emendation:

²⁰The manuscript is catalogued in *Tabulae Codicum*, vol. IV, 81.

²¹The manuscript is catalogued in *Tabulae Codicum*, vol. II (Vienna 1868), 220, although the first two thirds of the treatise are incorrectly attributed to d'Ailly's *Exhortatio*, and the last third (beginning in tract. 3, c. 3, at l. 340), after the blank folio 215, is mislabelled a separate work. Kaltenbrunner (*Die Vorgeschichte*, 30), correctly distinguished the first section from d'Ailly's text, but failed to identify the last section of John and Firmin's work.

²²Cf. Plassard, "Projets," 181.

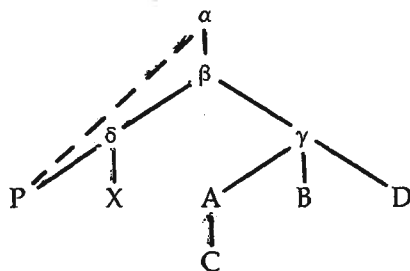
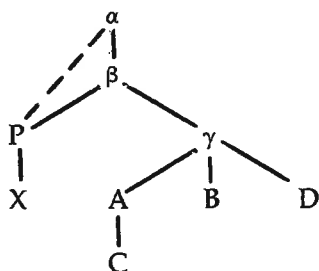
the "non solum" clause, present in all mss., requires a clause beginning with "sed" (C adds the expected "etiam", but P and X have "sed cum hoc").

B has over 20 singular variants, including an omission of 19 words at ll. 411-412. D has over 50 variants on its own. B and D share a few minor variants: 99 ita] ista BD; 265 destructio] destitutio BD; 423 illo²]illa BD; 468 cadat] cadit BD; and 475 eandem] eadem BD. These are probably accidental, so there is no strong need to posit another exemplar for BD.

X is perhaps the worst manuscript, with over 50 singular variants, including eight omissions of five words or more. As mentioned above, X is closely linked with P before P's corrections, with 15 or so common variants. These facts suggest either that P and X come from the same exemplar (δ), different from that of ABCD, or that X is copied from P before P's corrections. It is very likely that X copies P, but there are a few problems with this assumption: in almost all cases where P has a correction in the margin or above the line, X has an omission, but in one instance, at ll. 129, X actually has "est ille mensis" in the text, but P has it in the margin. This may be a correction contemporary with P's text, however, as opposed to its other corrections, which may come slightly later. Also, in ll. 12, 31, 32, and 100, P has minor spelling errors that X has not, but those can be explained away easily, as can the instance in l. 471 where P has "esset" instead of the "esse" which X has and which is required by sense, following "debet". More significant is a variant on l. 462 where P clearly has "in" instead of "cum" as in all other mss. Thus the precise relationship between P and X cannot be determined with certainty.

It is fairly certain, however, that all manuscripts descend from the same exemplar β , which is not the archetype, since before P's corrections PX share at least 14 variants with ABCD, mostly small omissions (ll. 10, 59, 112, 123, 142, 182, 195, 266, 316, 329, 343, 398, 422, and 448), and yet P corrects these. The source of these corrections in P is likely to be an archetype, which I will call α . At any rate, P has very few demonstrable errors, mostly quite minor; the most significant one, an omission by *homoioteleuton* of twelve words, comes only in the 'user's manual' attached to the text, which it may not have bothered to correct (l. 548-549). There also appear to be omissions in all mss. at l. 397 in the main treatise, and at ll. 521-522 in the user's manual (in the latter case, I have supplied words), which also escaped P's corrector.

Thus the stemma appears to be one of these:



Editorial Procedures

I have followed P in the text, accepting the scribal corrections. Where the sense requires it, I follow the rest against P, but these cases are rare. In the apparatus, since X's relationship with P cannot be determined exactly, I give all of their singular variants and exclude only those of A, B, C, and D. If, however, any variant is quoted, all variants at that place are quoted, including those of single witnesses. I do include major omissions, however, even of single mss., and a selection of interesting additions or interpolations. The shared variants of ABCD (ABC for the tables, lacking in D) will be quoted as V (for Vienna).

Abbreviations and symbols used in apparatus criticus:

<verbum>	= 'verbum' not in mss., but needed for sense.
[verbum]	= 'verbum' present in mss., but should not be.
<*>	= there appear to be words missing in the mss.
<->	= there are unknown letters/words in an abbreviated variant.
x] y	= ms. has word y instead of x
x] y <i>add</i>	= ms. adds word y after x
x] y <i>exp</i>	= ms. added then removed word y after x
x <i>mg</i>	= ms. has x in the margin (<i>sup</i> = above, <i>inf</i> = below)
x <i>om</i>	= ms. omitted x
x] y <i>MSac</i>	= ms. had y instead of x, then corrected it
x <i>MSpc</i>	= ms. has x after a correction
x <i>supralin</i>	= ms. has x written above line
x <i>infralin</i>	= ms. has x written below the line
x <i>iter</i>	= ms. repeats x
xy <i>inv</i>	= ms. reverses the word order of x and y
x <i>m2</i>	= ms. has x written in a second hand.
(?) or ?	= uncertain reading
<i>illeg</i>	= illegible

INCIPIIT EPISTOLA SUPER REFORMATIONE ANTIQUI KALENDARII,
DIRECTA DOMINO PAPE CLEMENTI SEXTO PER VENERABILES ET
SOLEMNES ASTROLOGOS ET MAGISTROS IOHANNEM DE MURIS ET
FIRMINUM DE BELLAVALLE, ANNO DOMINI 1345°.

- 5 Sanctissimo in Christo patri ac domino nostro, domino Clementi sexto,
sacrosancte Romane ac universalis ecclesie summo pontifici, nos humiles et
devoti filii, Iohannes de Muris et Firminus de Bellavalle, ad beatorum pedum
oscula prostrati, presentamus hunc libellum. O quantum gaudium nos oves
Domini celebrare debemus, cum ecclesiam Dei tantum pastorem regere
10 percipimus, qui non solum presentem infirmitatem ovium remediat, sed et
futurorum morborum periculis, intellectualiter ea precognoscens, sollicitus est
obviare. Sane, in kalendario quo utuntur omnes vere Catholici, quosdam
defectus tanquam indagator subtilissimus percepistis, qui quidem defectus nisi
remedientur, adeo pululabunt quod in vestro sanctissimo grege, veritate
15 dimissa, oves in posterum forsitan caderent in errorem.

- Super cuius correctione, potissime quantum ad illam partem que tangit
aureum numerum, multos iam novimus laborasse. Et ad hoc etiam nos venimus
mandatum apostolicum prout scivimus humiliter adimplendo. Et postea, de
mandato vestro, reverendissimus in Christo pater et dominus noster, dominus
20 cardinalis Ruthenensis, aliqua nobis precepit, que cum secundum posse nostrum
adimplevissemus, et responsionem nostram super petitis sicut nobis videbatur
dedissemus, voluit et de mandato vestro precepit ut aliquas vias que nobis
viderentur meliores et ecclesie utiliores inveniremus, si possemus.

- Nos igitur devoti filii predicti, humiliter obedire penitus affectantes,
25 hoc opusculum unanimiter et concorditer composuimus, divinum auxilium
implorantes, ut, ad eius laudem et ecclesie militantis utilitatem, dubia nostri
kalendarii declarentur et defectus eiusdem sine recidivatione corrigantur.

EXPLICIT EPISTOLA: INCIPIIT PROHEMIUM

- In hoc autem opusculo quatuor sunt tractatus. In primo namque tractatu
30 declarabitur quid est annus verus et eius vera quantitas, et que sint diversi-
tates apud diversos in utendo anno solari, et quanta sit imprecisio anni solaris
quo ecclesia uti consuevit, et qualiter illa imprecisio remediatur, et que utili-
tates vel inconvenientia ex hoc sequerentur.

In secundo tractatu declarabitur quid est annus lunaris, et ad quid aure-

1-4 incipit...1345 *mg sup* P; *om* X; incipit tractatus de correctione kalendarii per m iohannem de
lineriis et franciscum de ballevalle compositus et transmissus clementi pape vi° *mg inf* X 3 de]
lineriis *exp* P 5 nostro] meo X 7 muris] lineriis PX || firminus] fremi B; f PXD || bellavalle]
ballevalle X 9 ecclesiam] ecclesia X 10 qui] ut XV, Pac || remediat] redimat X 12 vere] ferme
C; fere A || quosdam] quosdem P 14 remedientur] remedianur X, Pac 15 dimissa] *gre add* X 18
humiliter] humilitatis AC || adimplendo] adimplende AC 24 humiliter] humilitatis AC 26
laudem *om* X 28 incipit prohemium *om* X 29 autem *om* X 31 utendo] utando Pac || imprecisio]
impreciosio PB, Xac 32 imprecisio] impreciosio PB, Xac 33 hoc] f<->ter *mg* P

35 us numerus fuit inventus, et qualiter aureus numerus est defectuosus, et que inconuenientia sequerentur si non corrigeretur.

In tertio tractatu pretenduntur quidam modi quibus aureus numerus corrigitur, et utilitates et defectus, si sint, ibidem secundum posse nostrum pertractantur.

40 In quarto tractatu declarabuntur aliqua principia et alique regule per quas videbitur qualiter Pascha debeat de cetero celebrari. Et ibi ponuntur plures modi, et tanguntur utilitates et defectus uniuscuiusque modi, sicut in tractatibus precedentibus.

Et hoc scienter facere voluimus ut sacrosancta Romana ecclesia, que
45 Spiritu Sancto regitur, utiliore viam minusque defectuosam eligere valeat et tenere.

INCIPIT TRACTATUS PRIMUS

CAPITULUM PRIMUM: DE ANNO SOLARI VERO ET EIUS QUANTITATE

Annus verus solaris est tempus revolutionis solis per zodiacum primi
50 mobilis, cuius quantitas a diversis actoribus invenitur diversa, ut patet in tabula presenti, in qua fractiones vulgares quas posuerunt reducuntur ad fractiones horarum consuetas:

	Dies	Hore	Minuta	Secunda
Abrachis	365	6	0	0
55 Ptholomeus	365	5	55	12
Albatheny	365	5	47	9
Alfoncius	365	5	49	16

Unde Ptholomeus, in tertia dictione *Almagesti*,¹ posuit annum solarem esse ex 365 diebus et quarta diei, preter 300^{mam} partem unius diei. Abrachis
60 autem, eius antecessor, posuit quartam integram. Albatheny, successor Ptholomei, posuit illam quartam minui ex 112^{ma} parte unius diei. Astrologi Alfonsi affirmant quartam illam adimpleri, exceptis 10 minutis hore et 44 secundis, et hec quantitas temporibus nostris apparet propinquior veritati. Thebith autem posuit maiorem quantitatem omnibus, sed quia hoc fecit ad octavam speram,
65 ideo ipse non posuit quantitatem veri anni, scilicet tempus in quo sol redit de equinoctio vernali ad idem, et sic de aliis punctis zodiaci primi mobilis.

36 corrigeretur] corrigerentur XV; Pac 41 pascha mg P 48 vero om X; infralin P 49 solaris om X
51 fractiones] fracturas X; supralin D 55 ptholomeus] ptolomeus XA; ptolomeus C 57 alfoncius]
alfonsus V 58 ptholomeus] ptolomeus ABD; ptolomeus C || almagesti] almagesti V 59 diebus
mg P; om XV || diei¹] dei X || 300]ccc D; 300^a pars unius diei est 4 minuta et 48 secunda mg D 60
autem] aut X || albatheny] albateny X; albategni V 60-61 ptholomei] tholomei PX; ptolomei
AB; ptolomei C 61 112^{ma}] cxii D; 112^{mam} PX || diei] dei X 62 exceptis] ex XV; partim mg P 63
thebith] thebit X 64 hoc] hec AC 65 ideo ipse om X; ideo B

¹ Cf. Ptolomeus, *Almagest* III.1 (ed. Liechtenstein, Venice 1515, f. 28v).

Posteriores autem in hoc casu magis credendi sunt quam priores, eo quod in temporibus magis distantibus observationes suas habuerunt, ita quod multa insensibilia potuerunt latere priores que in remotiori tempore posteriores
 70 percipere potuerunt. Potest etiam probabiliter sustineri quod omnes bene observaverunt, ita quod, sicut in veris motibus planetarum quedam inequalitates percipiuntur — quandoque enim apparent veloces, quandoque tardi, quandoque stationarii, et quandoque retrogradi — sic in motu solis annuali potest esse inequalitas, cuius quantitas pluribus observationibus sicut in aliis
 75 tardis motibus potuit estimari. Et iam facta est in arte astronomie doctrina de equationibus annorum solarium, sicut de equationibus planetarum. Et de hac materia in tractatibus eiusdem scientie plenius habet videri.

CAPITULUM SECUNDUM:

DE DIVERSITATE USUS ANNI SOLARIS APUD DIVERSOS

80 Usus autem annorum solarium multipliciter variatur. Sunt enim quidam qui non ponunt in anno solari nisi 365 dies precise, sicut gens Persarum. Alii autem ponunt 365 dies cum quarta unius diei, ita quod in quatuor annis faciunt unum diem qui 'bissexus' appellatur. Et isti iterum variantur. Quidam enim faciunt quartum annum bissextum sicut et nos, alii tertium, alii
 85 secundum, alii primum, secundum quod initium ere sue se habebat. Rursum quidam incipiunt annum ab Octobri, alii a Septembri, et sic de aliis secundum quod grandes mutationes in principiis suarum erarum tali vel tali mense veniebant.

Nos autem Latini consuevimus facere annos solares quorum quartus
 90 semper est bissextilis, et inchoamus a Ianuario. Et multum ante adventum Christi isto utebantur anno, ita quod quando sol erat in solstitio hyemali, quod erat tunc in kalendis Ianuarii, tunc initium anni faciebant. Et adhuc in illa die, non obstante remotione illius a solstitio, usque nunc annum nostrum facere consuevimus.

95 CAPITULUM TERTIUM: DE CORRECTIONE KALENDARIJ SOLIS

In kalendario autem Latinorum, quo utitur sacrosancta Romana ecclesia, fit elongatio festorum immobilium notabilis a veris solstitiis et equinoctiis propter hoc quod veram quantitatem anni precise non computamus. Ita quod secundum tabulas Alfoncii, quas credimus in proposito ceteris veriores,
 100 et per multas sensibiles experientias Parisius et alibi magis consueverunt approbari, in singulis 134 annis fit elongatio predicta ad quantitatem unius diei. Igitur <si> qui<s> vellet hanc imprecisionem nostre computationis consu-

68 suas] magis add X 70 etiam] igitur X 72 enim] ei XABD 74 pluribus iter Pac 75 astronomie]
 <?regu>la vel mg P 79 de] de exp X 81 365] 355 X 84 bissextum] bissextilem AC 85 se om X
 89 nos] de anno latinorum mg X 91 utebantur] utebatur XAB, C ac 95 capitulum... solis om X 96
 in] a A 97 notabilis] notalis A 99 ita] ista BD 100 experientias] expientias P

ete corrigere, expediret aut quod in uno anno anticiparentur festa immobilia
 105 per tot dies quotus esset numerus elongationis, aut quod in pluribus annis, per
 obmissionem tot dierum bissextilium quotus esset numerus predictus, ad statum
 pristinum reducerentur; et ut de cetero immobiliter remanerent, in singulis 134
 annis obmitteretur unus bissextus, et cursus littere dominicalis secundum hoc
 aptaretur. Et tunc oporteret quod kalendarium lune, quo indigemus quantum ad
 festa mobilia, taliter moderaretur quod, non obstante correctione kalendarii
 110 solis, novilunia et festa mobilia celebrarentur ut deceret.

Et si correctio kalendarii solis esset ecclesie eque utilis sicut correctio
 kalendarii lune, et sciremus quod placeret, iam diu est taliter laborassemus
 quod, kalendario nostro sano et integro remanente, festa mobilia et immobilia
 ad statum sue primarie institutionis reducerentur, et sine elongatione notabili
 115 tam kalendarium solis quam lune vera longissime perseverarent in futurum.

Sed quia correctio kalendarii lune magis est necessaria quam correctio
 kalendarii solis, ut videbitur infra,³ et vocati sumus solum ad correctionem
 kalendarii lune, propter hoc de labore predicto non immerito volumus super-
 sedere.

120 CAPITULUM QUARTUM: DE UTILITATIBUS AUT INCONVENIENTIBUS EX CORRECTIONE KALENDARII SOLIS

Utrum autem in ecclesia Dei magis expediat kalendarium solis sicut
 est remanere quam illud corrigere vel in aliquo immutare, postea est dicendum.

Videtur autem quibusdam quod correctio eius sit ecclesie utilis. Primo,
 125 quia precisum honestius et utilius est impreciso; sed kalendarium quo utimur
 est imprecisum, et per sui correctionem ad precisionem reduceretur; ergo etc.

Item, illud est faciendum per quod sanctum Pascha recte celebretur in
 Dominica sequenti lunam 14 primi mensis, ut patet in illo capitulo "Celebrita-
 tem," "De consecratione" distinctione tertia;⁴ sed primus mensis est ille mensis
 130 cuius plenilunium est in equinoctio vernali vel immediate post equinoctium, ut
 videbitur inferius;⁵ equinoctium autem non possumus debite et vere cognoscere
 et in kalendario nostro ad locum pristinum reducere atque de cetero in eadem
 die facere permanere, nisi remediatur kalendarium solis; ergo etc.

Oppositum arguitur sic: Si kalendarium solis corrigeretur vel in aliquo
 135 mutaretur, tunc haberemus annos alterius quantitatis quam habere solebamus;

104 aut] autem XAC 104-105 elongationis...numerus om per homeo X 109 mobilia] celebrarentur
 ut deceret exp P 109-110 taliter...mobilia om per homeo X 111 si] sicut X 111-12
 solis...kalendarii om per homeo X 112 est] et AC || laborassemus] laboraremus AC 113 quod] ut
 XV, Pac 114 reducerentur] in al 0 2 0 mg P; reducentur D 121 inconvenientibus] ecclesie lu<->
 mg P 123 est² supralin P; om XV 125 quia supralin A; quod C 128 illo] primo XAC, Pac 129 est
 ille mensis om per homeo V; mg P

³ Cf. hic infra 225-284. ⁴ Gratianus, *Decretum*, pars tertia, d. 3, c. 22 (in *Corpus iuris canonici*
emendatum et notis illustratum, Lyon 1614, col. 1202). ⁵ Cf. hic infra 173-197.

sed hoc est inconueniens; quare etc. Maior patet, quia oporteret quod remedium fieret per omissionem aliquorum dierum bissextilium vel non bissextilium, quos usque nunc consueuimus in nostris kalendariis celebrare; et sic quantitas annorum novorum esset minor quantitate annorum consueta. Sed quod hoc sit
 140 inconueniens probatur, quia cum computationes annorum in curiis principum variarentur, et lites inter partes super debitis, contractibus et multis aliis hanc materiam tangentibus, que in curiis principum ventilantur, et forte sediciones orirentur, ita quod, si propter evitacionem talium aliqui principes alio anno quam consueuerunt uti voluerint, dilusiones alique inter illos principes et
 145 ecclesiam sequi possent. Et quod deterius est, computatio annorum incarnationis Christi apud omnes fideles summe consueta deficeret, quia annus consuetus, qui fuit usque nunc mensura consueta temporum, esset alterius quantitatis, et inciperet de cetero computatio a renouatione kalendarii solis, tempus verum et precisum incarnationis Domini dimittendo, ac si faceremus ritum novum.

150 Item ad hoc non obligamur tenere quod non est nobis preceptum, sicut nec evitare quod non est nobis prohibitum; sed non est nobis preceptum a Domino festa immobilia tali vel tali die vel mense celebrare, quamvis secus sit de mobilibus; ergo si ea sicut sunt dimittamus, non erramus. Eligat igitur vestra sanctissima paternitas quid super hoc fuerit faciendum.

155 INCIPIT SECUNDUS TRACTATUS

CAPITULUM PRIMUM: DE ANNO LUNARI

Anni lunares sunt duplices, quidam enim sunt anni communes, alii sunt embolismales. Anni communes sunt ex 12 lunationibus, que continent secundum veritatem 354 dies, 8 horas, 48 minuta, et 36 secunda. Embolismales autem con-
 160 tinent 13 lunationes; id est, secundum veritatem, 383 dies, 21 horas, 32 minuta, et 39 secunda.

Hebrei autem utuntur istis annis lunaribus per hunc modum quia annus solaris superat annum lunarem communem in XI diebus fere. Quando ergo ex aggregatione istorum dierum potest fieri lunatio, sicut in tertio vel sexto anno
 165 ipsorum, tunc faciunt unum annum lunarem ex 13 lunationibus, et dicitur 'embolismalis'; et nisi facerent istos embolismos, in quibuslibet tribus annis recederet initium sui anni plusquam per unum mensem ab equinoctio vernali. Ita quod per istum modum nituntur quantitatem 19 annorum solarium quantitati temporis 235 lunationum adquare.

137 vel non bissextilem *mg* P; *om per homeo* XBD || quos] quod XV; *Pac* 139 annorum consueta *inv* X 142 ventilantur] vacillantur XV, *Pac* || et forte sediciones] sediciones X; sed *Pac* 144 consueuerunt] consueverit D; consueuerint P || dilusiones] illusiones XC; <-> ita() *mg* P 145 est *supralin* P 146 christi] <-> ci() s() *mg* P 147 et *om* XV; *mg* P 150 obligamur] obligantur X 156 capitulum... lunari *om* X || lunari] solari AC 158 communes] de anno lunari? communi? *mg* X 159 8] 6 X || 48] 58 XV || embolismales] de anno embolismali *mg* X 162 annis] ununtur *add* X 164 lunatio] lunacione X || vel] in *add* X 169 235] 335 PXABC, *Dac*

170 De quo anno, scilicet embolismali, dicit Rabanus in 7^o capitulo libri quinti:⁶ "Ipse est annus, secundum Moysen divinitus revelatus, in quo iubetur hiis qui longius habitant in secundo mense Pascha celebrare."

Primus autem mensis istorum est ille mensis lunaris cuius plenilunium cadit in die equinoctii vernalis vel immediate post ipsum equinoctium. Et
175 propter hoc tenuit ecclesia quod in 21 die Martii, in quo erat equinoctium vernale tempore quo sancti patres regulam de Paschate statuerunt, queratur plenilunium vel immediate post. Et in Dominica sequente illud plenilunium celebrabitur Pascha, sicut dicitur expresse in canonibus Apostolorum.⁷ Et de hoc dicitur quando de regulis Paschalibus locuti fuerimus.⁸

180 Iste autem primus mensis appellatur Hebraice 'Nisseni'. Et antiquitus, sicut in exitu filiorum Israel de Egipto, frequentius cum Aprili concurrebat. Et propter hoc dicitur 16 Deuteronomii⁹ quod primus mensis est Aprilis. Nunc vero Martium potius primum mensem appellare debemus, quia equinoctium vernale est 12 die Martii, et ideo primus mensis Hebreorum nunc frequentius
185 concurrit cum Martio, et iam diu est appellatus primus. Unde September, qui est septimus a Martio, vel lunatio Septembris, secundum doctores erat septimus mensis anni apud Hebreos, in quo septimo mense fiebat festum Expiationis, ut habetur Levitici 23^o capitulo et Numeri 29^o.¹⁰ De hoc autem mense, qui dicitur 'Nissan', dicitur Exodi 12 capitulo:¹¹ "Mensis iste, vobis principium mensium,
190 primus erit in mensibus anni." Super quo verbo venerabilis Doctor Nicolaus de Lyra dicit sic:¹² "Et dicit 'vobis' quia apud Latinos Ianuarius est primus. Similiter apud Hebreos September est primus secundum communem opinionem, quia in eo fuit creatus mundus, et usque ad illud tempus vocatur 'primus' apud Hebreos. Sed ex illo notabili beneficio, scilicet exitu de Egipto mirabili, quod
195 Deus prestitit in isto mense, vocatus est de cetero primus mensis." Sic ergo patet qualiter Hebrei utuntur anno lunari et in quo mense debeant inchoare annum suum.

170 scilicet] bissextili exp PX || in] a add X 171 quinti] aliter sexti mg P; supralin C; 7 exp C 174 cadit] equi exp X 175 21] 12 V 175-176 vernale] de equinoctio vernali mg X 182 16] 76 mss || deuteronomii] dies XV, Pac; d0 Ppc; diebus exp C; primum vero add BD, Pac; in al() no^(a) supralin P 184 die] diem P || martii] que die marci (vernali exp) est equinoctium vernale mg X 185 est] quod add X || appellatus] appellatur X 190 doctor] magister add ABD 191 lyra] lira BD || quia] quod PX 192 similiter...primus om per homeo X; primus mensis iudeorum est september mg X 193 fuit creatus inv V || illud] istud V || vocatur] vocabatur V 195 deus supralin P; om XV 196 hebrei] iudei C; mg A; iudei exp A

⁶ Hrabanus Maurus, *De universo* V, c.8 (!) (PL CXI, col. 127). ⁷ Cf. Gratianus, *Decretum*, "Canones sanctorum apostolorum per Clementem a Petro," n. 7 (*Corpus iuris canonici*, Lyon 1614, col. 1265)

⁸ Cf. hic infra, tract. 4. ⁹ Deuteronomium 16.1. ¹⁰ Leviticus 23.23-44; Numeri 29.1-39. ¹¹ Exodus 12.2. ¹² Nicolaus de Lyra, *Postilla super totam Bibliam* (v.1, ed. Strasbourg 1480/81; repr. Turnholt 1992, p. 133b, non verbatim).

CAPITULUM SECUNDUM: DE AUREO NUMERO ET DEFECTIBUS EIUS

200 Sacrosancta Romana ecclesia non solum utitur anno solari Latinorum
ad habendum festa immobilia sed cum hoc utitur anno lunari Hebreorum ad
habendum festa mobilia. Ita quod, sicut per litteras feriales cognoscimus
quibus feriis festa immobilia debeamus celebrare, sic per quemdam numerum,
qui 'aureus' appellatur, scimus initia lunationum et terminos festorum mobili-
um quolibet anno reperire. Et quamvis per aureum numerum antiquitus illa que
205 predicta sunt competenter poterant reperiri, nunc tamen notabiliter deficere
percipitur. Sunt enim ibidem duo perceptibiles defectus. Unus quidem defectus
accidit propter sui vacillantem et imprecisam situationem. Alius est propter
novilunii ab aureo numero anticipando continuam elongationem.

Primus itaque defectus causatur propter antiquorum grossam computa-
210 tionem. Faciebant enim unam lunationem de 29 diebus et aliam de 30, non
curantes de fractionibus horarum nisi quando estimabant quod possent facere
unum diem, et tunc saltum lune celebrabant; ita quod, tam propter horarum et
minutorum omissionem quam propter bissextum in uno ciclo decennovenali et in
alio aliter se habentem, contingit quandoque plus quam per unum diem ante vel
215 post aureum numerum a novilunio deviare.

Iste tamen defectus est ita parvus quod a vulgo minime percipitur. Et
antiqui patres, grosso modo tempora lunationum computantes, grossis et
facilimis regulis indigebant. Et propter hoc istum defectum ecclesia forsitan
corrigere non curavit.

220 Secundus defectus provenit ex eo quod tempora 235 lunationum 19 annis
solaribus non equantur, ymo secundum quod per calculum numerorum invenimus,
in 310 annis cum 260 diebus novilunium anticipat aureum numerum una die. Et
nisi iste defectus corrigatur, in ecclesia Dei sequentur inconvenientia valde
magna.

225 Primo enim sequeretur etatis lune falsa pronuntiatio, propter quod
vulgus posset murmurare. Dicitur enim sic in capitulo "Placuit," "De consecra-
tione" distinctione tertia.¹³ "Placuit ut postquam omnia in consilio sacerdotum
fuerint ordinata, illud omnino observetur ut superventurum ipsius anni Pascha,
quo kalendarum die vel quota luna debeat suscipi, a metropolitano intimetur,"
230 et infra. In martirologiis etiam multarum ecclesiarum continetur quota luna
pronunciari debeat."

198 defectibus] de effectibus X 200 habendum] habenda AC || immobilia] mobilia X, Pac 200-
201 immobilia...festa om per homeo ABD; immobilia sed etiam anno lunari ad habenda festa C ||
sed...festa om Pac; sed c->-tur a() <->nari <-> or(um) <-> festa <-> mg P 202 quibus] fest exp P
208 novilunii] novilunium XV 211 curantes] curando ABC 212 lune] cela exp X || et² om AC 214
habentem] habente XA 217 tempora] tempore P; tempus B 220 tempora] tempore P; tempus B ||
235 Ppc et mg; 335 XV, Pac 225 sequeretur] quod exp X; seq + illeg D 229 metropolitano]
metropolinatano Pac

¹³ Gratianus, *Decretum*, pars tertia, d. 3, c.25 (*Corpus iuris canonici*, Lyon 1614, col. 1203).

Pronunciatur igitur istis temporibus prima, quando iam realiter est quarta, et processu temporis quinta, sexta, septima, et sic de aliis donec poterit videri plena vel 15^a quando nova pronunciabitur in ecclesia sive prima. Ita
 235 quod non solum propter festivitatem Paschalem in ecclesia etas lune vere debet pronunciari, sed, quia cum apud alios ritus hec conclusio sit valde nota, eosque fide gratia Spiritus Sancti et humanis argumentationibus vincere vel ad veritatem fidei Catholice cottidie reducere conemur, hanc conclusionem de etate lune extraneis vel adversariis notissimam, qua etiam carere non possu-
 240 mus, nobis non est expediens ignorare; quod si in ecclesia Dei hoc ignoraretur, vulgus hunc defectum percipiens non immerito murmuraret.

Iterum propter istum defectum contingit sanctum Pascha in non debito tempore celebrare et ecclesie sacros canones indebite observare. Dicitur enim in capitulo "Celebritatem" "De consecratione" distinctione tertia,¹⁴ quod "a
 245 14^a luna primi mensis usque ad 21 diem eiusdem mensis eadem celebretur festivitas," et infra. Nunc autem, propter hunc defectum, celebramus Pascha a 18^a luna usque ad 24. Etiam isto anno 1345, aut per 8 dies ante aut per 20 dies postquam deberet celebratur, secundum quod ex ultimo tractatu huius libelli probari potest evidenter.¹⁶

250 Iterum, propter hunc defectum sequitur concordie veteris et novi testamenti dissolutio, ex qua Iudei vel infideles nos possent in posterum deridere. In veteri enim testamento immolabatur agnus luna 14 primi mensis ad vesperam, et tunc erat Pascha Domini, et in die sequenti fiebat solemnitas Azimorum, prout patet Levitici 23, ubi dicitur:¹⁷ "Mense primo 14 die mensis
 255 ad vesperam Pasche Domini, et 15 die mensis huius solemnitas Azimorum Domini est." Idem Exodi 12, et Numeri 9 et 28, Iosue 5, et 2 Paralipomenon 35 capitulo.¹⁸ Et quia agnus ille signabat Christum, [qui] cum in die Dominica resurrexisset, ordinauerunt patres nostri quod in die sequente lunam 14^{am} primi mensis fieret nostra sancta Paschalis festivitas, in qua Christus a fidelibus
 260 immolatur. Cum igitur propter defectum aurei numeri aliter contingit nobis Pascha nostrum celebrare, Iudei et gentiles hanc veteris et novi testamenti discordiam percipientes, de nobis tanquam remedium adhibere nescientibus non immerito deriderent.

Item, propter defectum istum sequeretur miraculi fidem Catholicam

235 quod non iter Pac 238 conemur] conentur X 240-242 ecclesia...istum om B 243 dicitur] dicit XV 245 celebretur Ppc 246 hunc] istum X 247 anno] scilicet add V (scilicet iter D) || aut¹] et si P || 20] 10 X 248 deberet] debent X 250 et novi om X 252 immolabatur] immolatur XV || agnus] 14 exp X || luna 14 inv AC 254 levitici] leivitici Pac 255 die om AC 256 domini om AC || exodi] azodi P; ozodi X || 9] 19 Ppc 258 primi] primis Pac 260 aliter mg P; om D 264 catholicam] sumere exp C; Apc

¹⁴ Gratianus, *Decretum*, pars tertia, d.3, c.22 (*Corpus iuris canonici*, Lyon 1614, col. 1202). ¹⁶ Cf. hic infra, tract. 4. ¹⁷ Leviticus 23.5-6. ¹⁸ Exodus 12.18; Numeri 9.11 et 28.16-17; Iosua 5.10-11; II Paralipomenon 35.17.

265 summe confirmantis destructio, ex quo sanctissimi patres nostri negligentes vel
ignorantes reputarentur, quod absit. In passione enim Domini fuit eclipsis solis
miraculosa et contra naturam, quod per astronomos potuit sciri multis modis.
Primo, quia nulla eclipsis potest durare tribus horis nec potest esse universalis
per universam terram, sicut per tempus transitus quantitatis dyametri lunaris
270 per dyametrum solis et per artem de diversitate aspectus evidenter potest
probari; sed illa eclipsis tribus horis duravit et universalis ubique terrarum
apparuit, ut patet Luce 23 capitulo, ubi dicitur:¹⁹ "Erat autem fere hora sexta
et tenebre facte sunt super universam terram usque ad horam nonam"; ergo etc.

Item, nulla eclipsis solis potest fieri in plenilunio, quia tunc luna non
275 potest poni inter visum nostrum et solem; sed illa eclipsis fuit in plenilunio,
secundum quod uterque nostrum iam diu est adequavit; ergo etc.

Cum ergo processu temporis propter defectum aurei numeri posset in die
veneris facta coniunctio solis et lune visibilis evenire, et sol posset naturaliter
eclipsari, et sic illa eclipsis miraculosa, que in consimili die fuerat, posset per
280 modum quo celestia redire consueverunt pro naturali reputari.

Sic etiam sanctissimi patres nostri, cum per correctionem aurei numeri
possent hec remediare, negligentie vel ignorantie eorum, quod absit, a quibus-
dam posset imputari. Bonum est ergo aureum numerum ad novilunia taliter
reducere quod ecclesia sancta Dei possit supradictis inconvenientibus obviare.

285 INCIPIT TERTIUS TRACTATUS: DE REDUCTIONE AUREI NUMERI
CAPITULUM PRIMUM: DE PRIMO MODO

Multi modi sunt reducendi aureum numerum ad novilunia. Unus modus
est per aurei numeri renovationem, ita quod numerum antiquum propter hoc a
kalendariis abradere non oportet; sed novus iuxta illum scribi poterit, illo,
290 scilicet antiquo, sterili remanente. Vel in fine kalendarii fieret una tabula per
quam facillime novilunia et etas lune cognoscerentur in futurum. Et iam
vidimus multa kalendaria et multas tabulas super huius conclusionem compo-
sitas. Sed quia quilibet qui tales tabulas facit ponit horas et partes horarum
in quibus sol et luna coniunguntur respectu sui meridiani, ponemus plures modos
295 secundum istam viam, per quos vera dies coniunctionis medie, ad meridianum
tamen Ierusalem, poterit comprehendere, dimittendo horas et minuta, quia

265 destructio] destitutio BD 266 enim] autem XV, Pac; de eclipsi que fuit in passione domini mg
X 268 primo om X; supralin P; quod exp B 269 quantitatis] quantitas X 275 illa] ista V 276
nostrum] est add C; est exp A || est supralin A; om C || adequavit] adequatum AC 278
naturaliter] e exp P 279 que] quia XV || fuerat] fuerit X 281-83 sic...imputari om per homeo X;
mg sup P (a quibusdam posset] posset a quibusdam P) 283 numerum om C 285 tertius tractatus exp
P; add in mg m3 P; inv C; illeg + tractatus D 286 capitulum...modo om PX; capitulum primum mg
m2 P 287 ad illeg P || modus iter X 288 ita quod illeg P 289 kalendaris] kalendario AC ||
scribi poterit] scr + illeg + erit P 290 una] illeg + a P 292 huius] huiusmodi XB

¹⁹ Lucas 23.44.

ecclesia, facillimis indigens regulis, semper per dies integros consuevit computare. Et unum mensem pro quolibet modo verbi gratia describemus.

In qualibet istarum tabularum posuimus aureum numerum novum iuxta antiquum ut videatur qualiter sine abrasione veteris numeri novus de cetero se haberet.

Numerum autem novum prime tabule [T1] sic formavimus: Quesivimus in quibus horis erit coniunctio media solis et lune ad meridianum Ierusalem per unum cicum 19 annorum ab anno domini 1349, in quo curret unitas pro aureo numero, inchoando diem a media nocte precedente. Et in qua die inveniebatur coniunctio media, hic situavimus aureum numerum currentem in illo anno.

Litteras autem secunde tabule [T2] loco numeri composuimus eodem modo sicut prime, nisi quod hoc fecimus usque ad 76 annos, in quibus anni solares et lunares potius quantum ad variationes bissextorum coequant quam in 19 annis solaribus. Et secundum istum modum iam vidimus multa kalendaria facta. Unde Magister Petrus de Dacia²⁰ utilius fecit pro ecclesia quia accepit initium diei a media nocte, alii autem a meridie. Et acceperunt omnes isti litteras alphabeti loco numeri aurei ut minorem locum occuparent.

Numerus autem aureus novus tertie tabule [T3] sic componitur: In anno 1349 et in quolibet primo anno post bissextum inchoavimus diem a media nocte; in secundo vero anno per 6 horas post, scilicet versus ortum solis; in tertio autem in meridie; et in anno bissexti per 6 horas post meridiem, scilicet versus occasum solis in principio noctis precedentis. Hanc autem extraneam computationem fecimus ut per solum unum cicum salvaremus illam vacillationem bissextilem, propter quam oportuit quibusdam, ut dictum est,²¹ quatuor ciclos componere. Et secundum istam computationem, in illa die in qua coniunctionem mediam solis et lune invenimus, aureum numerum illius anni posuimus.

CAPITULUM SECUNDUM: DE COMPARATIONE ET CONTINUATIONE ISTORUM MODORUM

Primus autem modus excedit alios in facilitate compositionis, et excedit secundum in paucitate localis occupationis et brevitate considerationis. Secundus excedit primum in precisione numerationis, et tertium excedit in facilitate compositionis. Sed tertius excedit primum in precisione numera-

298 modo] pro add V 299 istarum] ista V || aureum numerum inv ACD 300 abrasione] abrisione Xac 302 novum om PX || formavimus] formamus V 303 erit supralin P; om X; ex' A 305 inveniebatur] veniebatur V 309 variationes] variationem AC || coequant] coequat V 310 kalendaria] iam add X 311 accepit] accipit V 314 aureus novus inv V 316 scilicet] 8 V || ortum mg P; om XV || solis] solem X; ? supralin et del A 316-17 scilicet...post om per homeo C 319 solum mg P; om XV || cicum] circum X || vacillationem] vacillantem AC 321 componere] apponere V || computationem] invenimus aureum numerum exp P 323 capitulum secundum add in mg m3 P 326-27 et brevitate considerationis mg P; om V 327 exedit primum iter Pac 327-29 et... numerationis mg P

²⁰ Cf. Petrus de Dacia, *Kalendarium* (ed. Fritz. S. Pedersen, *Opera Petri Philomenae*, p. 335, ll. 45-46). ²¹ Cf. hic supra 209-215.

tionis, et excedit secundum in paucitate localis occupationis.

330 Unusquisque autem istorum modorum posset describi in quadam tabula in fine kalendarii. Unusquisque etiam istorum modorum posset in veritate continuari per illam rotulam [R1] que cum tabula describitur, ita quod in quibuslibet 310 annis et cetera luna pronunciaretur prima per unum diem ante.

335 Si vero secundus modus tabularetur, fierent linee quatuor ut sit ibi aureus numerus.

Usus autem huius tabule [T4] talis est: Quere aureum numerum currentem pro illo anno sub mense in quo novilunium scire volueris; et numerus dierum scriptus a sinistris in cuius directo aureum numerum inveneris ostendet in qua die mensis erit solis et lune coniunctio.

340 CAPITULUM TERTIUM: DE SECUNDO MODO PRINCIPALI

Alii autem sunt modi principales quibus aureus numerus ad novilunium reducitur, ita quod aureus numerus ad habendum novam lunam sufficeret et in veritate qua fuit a principio remaneret. Unus modus est per quorundam dierum kalendarii solis ablationem. Et illi dies qui potius deberent auferri et cum 345 minori scandalo essent aliqui bissextilis, ita quod tam diu cessaret ecclesia ab observatione bissextorum quot dies sufficerent ad hoc quod aureus numerus ad pristinum statum reduceretur, et post eius reductionem quod in singulis 310 annis et cetera obmitteretur unus bissextus. Et sic aureus numerus in sua veritate remaneret.

350 Et iste modus satis bene tractatur in quodam libro quem composuit religiosus vir dominus Alvadus de Alione, Grissensis monasterii prepositus.²⁷ Unde quia in isto proposito bene et subtiliter propter bonum commune et utilitatem ecclesie fideliter magnis temporibus laboravit, propter hoc est sine dubio multipliciter commendandus. Verumtamen illa inconvenientia que fuerunt adducta contra correctionem kalendarii solis, et multa alia, possent contra 355 istam viam adduci.²⁸

Quid enim de nobis dicerent aliqui scismatici Christiani qui eadem die nativitatem Christi sicut et nos usque nunc consueverunt celebrare? Et viderent nos, qui consuevimus esse constantes, in 12 annis per tres dies in omnibus festis 360 nostris immobilibus sine ratione variare, cum astronomi illius secte et omnium

329 in *infralin* P; de XV; de *exp* P 330-31 describi...posset *om per homeo* PX; unusquisque autem modorum predictorum posset describi in quadam tabula in fine kalendarii *mg sub fine capituli* P 333 et cetera *om* X 334 ut] ubi XV? 336 numerum *om* V 338 aurum numerum *inv* PBD 340 modo *om* PX 341 quibus *iter* X 342 et] ut V 343 a principio *mg* P; *om* XV 344 solis *om* X; *mg* P | potius deberent *inv* AC 345 aliqui *om* C; *mg* A 349 remaneret] <-> ive (?) *add in* *mg* P 351 alvadus] arnoldus AC; arnaldus BD; alnadus P || grissensis *om* V; *mg* P 358 christi] domini V 360 sine ratione *mg* A; *supralin* C

²² Cf. Alardus de Dist, *Kalendarium* (ms. Erfurt, Wissenschaftliche Bibliothek, CA Q^o 370, ff. 1-7v). ²³ Cf. hic supra 134-154.

365 aliarum sectarum perciperent kalendarium solis propter hoc non corrigi, sed forte numerum aureum ignorantes et per aliam viam precisiorem novilunium cognoscentes. Et si cognoscant aureum numerum, per aliam viam meliorem quam per bissextorum obmissionem illum posse salvari percipientes quare tantam atque subitam mutationem faceremus in nostro sanctissimo ritu, non immerito mirarentur.

Non est tamen intentionis nostre dicere quin per istam viam, si sit bene et cum precisione que potest haberi calculata, possit aureus numerus ad novilunium reduci. Ymo dicimus quod si non possit melior et utilior via inveniri, 370 melius est ista inconvenientia cum quibusdam adductis remediare aut tanquam non inconvenientia tollerare quam numerum aureum sine correctione remanere.

CAPITULUM QUARTUM: DE TERTIO MODO PRINCIPALI

375 Alius modus est per quem novilunia facillime et durabilissime possunt inveniri, aureo tamen numero sano et utili remanente. Et fit per numeri elongationis inventionem per hunc modum: Ordinetur per ecclesias quidam numerus qui 'numerus elongationis' vocetur, ita quod quando novilunium distabit ab aureo numero per 4 dies appellabitur '4', et post 310 annos etc., quando scilicet distabit per quinque, appellabitur '5', et sic de aliis, donec fiat revolutio, scilicet in 9166 annis; et tunc redibunt idem numeri qui prius, sicut 380 patet in rotula [R2]. Unde non oportet nisi tot dies ante aureum numerum currentem illo anno quotus est numerus elongationis computare, et in illa die in qua terminabitur numerus lunam primam pronunciare.

Initium autem huius reductionis posset esse anno domini 1349. Et melius videtur nobis quod ecclesia inciperet tunc uti ista reductione quam alias 385 propter aliquas causas, quamvis etiam alio tempore bene posset, quodcumque videlicet placeret vestre sanctitati. Unde in anno precedenti illum annum iubileum in quo Christus de beata virgine carnem assumpsit pro numero aureo currebat unitas.

390 Similiter, quando ecclesia sancta Dei incepit uti aureo numero scilicet anno domini 209, prout etiam dominus Alvaldus predictus optime declaravit,²⁴ sic etiam nobis videretur expediens quod anno 1349, qui precedet illum annum benedictum iubileum 1350 de novo per vestram sanctissimam clementiam ordinatum, et unitas etiam pro aureo numero tenebitur, et 60 cicli decennovenales a tempore quo ecclesia incepit uti aureo numero complebuntur, ecclesia in-

361 perciperent] percipient A 362-63 novilunium cognoscentes *inv* B; novilunia cognoscentes ABC || precisiorem... viam *om per homeo* D 372 capitulum quartum *add in mg m3 P* 373 possunt] possint X 374 et utili *om* PX 378 donec] scilicet *add X* 379 revolutio] resolutio ABD, *Cac* || idem] eidem V 380 rotula] subsequenti *add ABC*; sequenti *add D* 381 illa] ista V; qua *exp B* 382 numerus *om X* 383 esse *om PX*; pesse *Aac* 387 numero aureo *inv V* 389 sancta dei *inv X* 390 alvaldus] arnaldus BD; arvaldus AC 393 et²] per X

²⁴ Non inveni in manuscripto Erfurt CA Q^o 370.

395 cipiat uti huius reductione.

Amplius, coniunctio media solis et lune ad meridianum Ierusalem erit versus mediam noctem sequentem 19 diem artificialem mensis Ianuarii, <*> quod circa tempora Christi in 23 die Ianuarii coniunctio media solis et lune quasi similiter se habebat. Et ab illo tempore numerus aureus erit per quatuor
400 dies a novilunio elongatus.

Melius est etiam inchoare quando novilunium cadit in fine diei naturalis ecclesiastici quam in aliis partibus diei, quia cum in quolibet ciclo fiat aliqualis anticipatio novilunii respectu aurei numeri, patet quod si fiat inchoatio in tempore quo novilunium cadit in fine diei, sicut erit anno domini
405 1349, diutius in sua veritate remanebit.

Hanc igitur viam multum approbamus propter sui brevitatem, precisionem, durabilitatem, et inconvenientium paucitatem. Est etiam adeo facilis quod quasi naturaliter venit ad habentem.

CAPITULUM QUINTUM: DE QUARTO MODO PRINCIPALI

410 Alius modus est reducendi aureum numerum ad novilunia. Est enim iste modus per unius numeri pro alio numero positionem, sicut loco unius utamur 15, et loco duorum utamur 16, et sic de aliis. Hoc enim potest fieri per hanc artem: Ordinetur per ecclesiam quidam numerus qui non differt ab aureo numero nisi quia retrograde describitur, sicut patet in figura sequente [R3].

415 Iste autem numerus ordinatus 'corrector' appellabitur. Et numerus qui nunc est in calendario vocetur 'aureus antiquus'.

Si ergo corrector addatur numero antiquo, removendo tamen 19 a producto si 19 transiverit, numerus inde proveniens vocabitur 'numerus correctus', et in qua die talis numerus reperietur, illa die per ecclesiam luna
420 prima pronuntiabitur. Verbi gratia, anno domini 1349 corrector curret per 14, sicut patet per sequentem rotulam [R2], et aureus antiquus per unitatem. Si ergo 14 addantur unitati, provenient 15, qui erit aureus correctus. Ubi ergo in calendario invenientur 15 illo anno, luna in illo die pronuntiabitur prima.

Notandum tamen quod per istam viam possumus quandoque per unam
425 diem a novilunio vacillare, unde novilunia possunt cadere in diebus in quibus non scribitur aliquis aureus numerus. Sed suffecit ecclesie usque nunc lunam primam pronunciare in illa die in qua inventus est aureus numerus illo anno currens, quamvis in die antecedenti vel sequenti multociens novilunium continget reperiri.

430 Ista autem via per quasdam computationes horarum et minutorum posset ad precisionem reduci. Sed ecclesia per dies integros semper computare

398 quod circa tempora christi *mg* P; coniunctio media solis et lune christi XV, *Pac* 404 tempore] in *add* AC 405 sua veritate *inv* ABC 409 capitulum quintum *add in mg* m3 P 411 per] pro PX 411-12 numero...potest *om* B 412 utamur *om* AC 418 si] decem *add* X 421 rotulam *Apc*; tabulam C; A 422 erit *supralin* P; *om* XV 423 illo²] illa BD 424 possumus] posuimus V

consuevit [etiam] sicut alias dicebatur.²⁵ Ista imprecisio procedit ex primario defectu aurei numeri, de cuius correctione ecclesia non curavit.

Adhuc multos modos invenimus et multi alii iam facti sunt et multi
 435 alii fieri possunt super ista reductione. Sed istos modos tantum posuimus quia nobis videntur breviores, precisiores, faciliores, ad quos etiam alii reduci possunt tamquam simpliciores et priores.

INCIPIT QUARTUS TRACTATUS

CAPITULUM SINGULARE DE MODO INVENIENDI PASCHA

440 De festivitate autem Paschali invenienda postea dicendum. Sacrosancta Romana ecclesia consuevit festivitatem Paschalem celebrare a 22^a die Martii usque ad 25 diem Aprilis. Cuius causa fuit quia antiqui patres nostri statuerunt quod a 14 luna primi mensis usque ad 21 sanctum Pascha celebretur, ut dictum est.²⁶ Et patet hoc in illo capitulo "Celebritatem," "De consecra-
 445 tione" distinctione tertia.²⁷ Unde in tempore huius constitutionis equinoctium vernale erat in 21 die Martii, secundum quod etiam per viam astronomicam equavimus, ita quod quando plenilunium erat illa die, celebrabant Pascha in Dominica immediate sequente. Si vero non caderet illa die plenilunium, querebant plenilunium immediate sequens post illud equinoctium, et in sequenti
 450 Dominica sanctum Pascha celebrabant. Unde ille mensis apud Hebreos est primus cuius plenilunium cadit in die equinoctii vernalis vel vicinius quam potest a parte post, ut dictum est prius in capitulo "De anno lunari."²⁸ Et secundum hoc compotiste, considerantes istas sanctas ordinationes, regulas de
 455 inventione Paschatis invenerunt, scilicet quod post nonas Martii queratur prima luna et computentur inde 14 dies, et in Dominica sequente erit Pascha.

Unde omnes iste regule in idem redirent in eternum, etiam post Pascha Iudeorum in Dominica sequenti semper esset Pascha nostrum, si equinoctium vernale semper 21 die Martii remansisset; et numerus aureus correctione non
 460 indignisset. Unde ille mensis qui vere primus est apud Hebreos respicit verum equinoctium vernale. Et propter hoc Martius non est proprie ille primus mensis, qui dicitur 'Nissan', de quo dicitur Exodi 12:²⁹ "Iste vobis erit primus in mensibus anni," etc, sed nunc frequentius concurrat cum Martio, ut dicebatur prius in capitulo "De anno lunari."³⁰

Oportet igitur altero duorum modorum Pascha invenire. Unus modus
 465 est quod queramus verum equinoctium vernale, quod est modo in 12 die Martii,

435 alii] adhuc V; iam add AC 436 videntur] viderentur AC, Dac; esse add V 438 quartus tractatus caput singulare add in mg m3 P || tractatus quartus add in mg m2 P 448 die supralin P; om XV 456 etiam] vel X 457 esset] essent X ac 458 die martii inv X 460-61 primus mensis inv X 462 concurrat om X; mg P || cum] in P 463 de anno om PX

²⁵ Cf. hic supra, 293-298. ²⁶ Cf. hic supra, 257-260. ²⁷ Cf. Gratianus, *Decretum*, pars tertia, d.3, c.22 (*Corpus iuris canonici*, Lyon 1614, col. 1202). ²⁸ Cf. hic supra, tract.2, c.1, 173-174. ²⁹ Exodus 12.2. ³⁰ Cf. hic supra, tract.2, c.1, 182-185.

ut patet non solum per tabulas astronomicas, verum etiam per experiencias
visibiles atque certas. Si ergo in eadem die cadat plenilunium, in Dominica
sequenti celebraretur Pascha nostrum. Si vero non cadat plenilunium in illa
die, accipiat plenilunium primum post illam diem, et in Dominica sequenti
470 Pascha debet celebrari. Et sic sanctos canones ad litteram teneremus, et
Pascha nostrum in Dominica sequenti diem in qua debet esse Pascha Iudeorum
celebraremus, et novum testamentum cum veteri concordaremus.

Sed si ecclesia teneret istam viam, tunc omnia festa mobilia exirent
terminos consuetos, ita quod festivitates que numquam fuerunt in 40^a reperientur
475 in eadem, et que numquam fuerunt nisi in 40^a extra eandem invenirentur. Et sic
oportet servitium divinum mirabiliter transmutare. Et quia equinoctium ibi-
dem fixe non remaneret, hoc oportet multociens corrigere, et sic magna turbatio,
quod absit, in ecclesia sequeretur.

Secundus modus est quod faciamus penitus sicut solebamus, infra termi-
480 nos consuetos, nisi quod operabimur per novilunium correctum, sicut operabamur
per aureum numerum, non curando de Paschate Iudeorum nec de vero loco equi-
noctiorum. Et tunc dicta sanctorum patrum possemus exponere per hunc modum:
Quando locuntur de primo mense vel de equinoctio vernali quod "a 14^a luna
primi mensis usque ad 21": id est a 14 luna illorum dierum anni nostri qui
485 cadere solebant in primo mense Hebreorum tempore constitutionis huius
canonis; vel cum dicitur "equinoctium vernale etc.": id est post illam diem anni
nostri in quo erat equinoctium in tempore supradicto, scilicet in 21 die Martii.
Sic enim omnes regule de Paschate vere et infallibiliter de cetero remanerent.

(USER'S MANUAL)

Ut veteris et novi testamenti debita servetur concordia, non solum uti
490 consuevit ecclesia Romana calendario solis Latinorum, verum etiam kalenda-
rio lunari Hebreorum. Unde per hoc kalendarium lunare cum antiquis nostris
patribus in celebratione Paschatis concordare debemus, nisi quod propter resur-
rectionem Domini diem Dominicam cum hoc etiam observamus.

In martirologiis etiam ecclesiarum continentur non solum quotus sit
495 numerus kalendarum, nonarum, seu yduum, sed etiam quota fuerit vel quota
luna in ecclesia quolibet die debeat pronunciari. Sed quia temporibus istis in
ecclesia luna pronuntiatur prima quando iam realiter est quarta, et processu
temporis 5^a, postea 6^a, et sic de aliis, donec ab omnibus poterit videri 15^a secun-
dum veritatem atque plena quando in ecclesia pronuntiabitur nova sive prima;
500 ex quibus venire possunt inconveniencia valde magna, nisi remedium congruum
apponatur; que omnia venirent, aut in futurum venire possunt, ex defectu aurei
numeri—

467 visibiles] verisimiles X 468 cadat] cadit BD
eadem BD 487 21] primi *exp* P 493 etiam *om* X

470 ad] a A 471 esse] esset P 475 eandem]

Propter hoc sunt multi modi remediorum iam inventi, inter quos unus videtur mihi pro martirologiis ecclesiarum utilior, eo quod sine aliqua mutatione litterarum aureum numerum representantium, vel numerorum etatem lune designantium, possumus per tempora longissima quota sit luna qualibet die pronunciare, non curando tamen de quadam modica vacillatione aurei numeri a novilunio proveniente, propter grossam antiquam computationem ac eius imprecisam situationem seu propter bissextorum in uno ciclo et in alio aliter se habentem, nec curando de spaciis vacuis in quibus, sicut in aliis diebus, novilunia secundum veritatem accidere possunt.

De quibus tamen omnibus, propter eorum parvitatem defectus a vulgo minime perceptibilem, nec augmentatur in posterum quamvis plus quam per unum diem fiat quandoque a veritate predicta vacillatio, ecclesia quantum ad eorum correctionem laborare non curavit. Sed semper in illa die in qua invenitur aliquis numerus aureus illius anni lunam primam pronunciari consuevit.

In hac igitur tabula [T5] continetur quidam numerus, in directo anno domini situatus, qui 'corrector' appellatur. Quod si annos Domini precise non inveneris, accipe numerum minorem propinquiorem annis Domini propositis. Quem correctorem adde cum numero aureo illius anni, removendo tamen 19 a producto si productum transiverit 19, et quod inde provenerit <erit aureus correctus. Et in qua die> aureus correctus inveniatur, eodem die in ecclesia luna prima pronuncietur.

In martirologiis etiam quere litteram que tali numero debetur et procede per totum annum sicut antiquitus fuerat consuetum. Verbi gratia, anno domini 1349 et annis sequentibus usque ad annum domini 1970 corrector curret invariabiliter per 14. Eodem autem anno, scilicet 1349, aureus numerus curret per unitatem. Si ergo 14 addantur unitati, provenient 15, qui est aureus numerus correctus. In illa ergo die calendarii in qua reperietur 15^a luna pronuncietur prima. Et in martirologiis numerus inventus sub 15 littera, scilicet sub 'p', in ecclesia singulis diebus per totum annum <luna prima> pronuncietur. Et sic de aliis suo modo, etc.

Possunt autem precisius novilunia reperiri sicut per tabulam precedentem [T4] cuius usus est iste: Quere aureum numerum currentem illo anno sub mense in quo novilunium scire volueris, et numerus dierum scriptus a sinistris, in cuius directo numerum aureum inveneris, ostendet in qua die mensis erit solis et lune coniunctio. Et in singulis 310 annis cum <260> diebus fiat unius diei anticipatio donec numeri in circumferencia rotule compleantur [R1]. Et tunc redibunt idem numeri qui prius.

Posset iterum per aureum numerum calendarii cum adiutorio sequentis

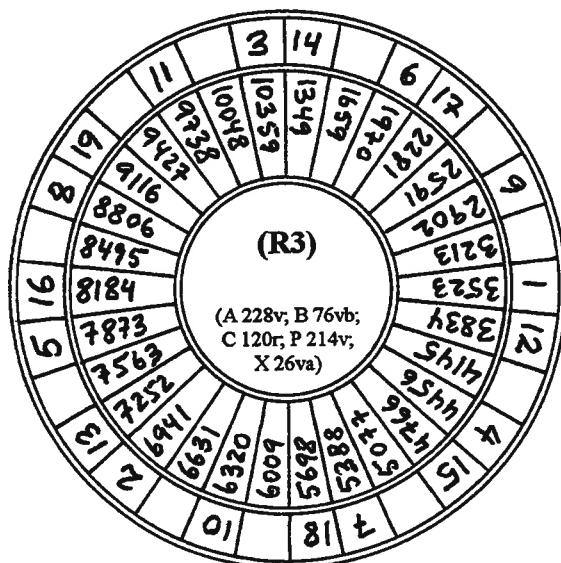
504 pro om X 510 habentem nec] habentem ne X 515 in¹ om PX 517 igitur om PX 518 annos] anno Xac || non supralin P 527 invariabiliter... curret om per homeo X 528-29 numerus om PXBCD 530 scilicet om X 532 etc om XV 535 scire volueris om X 537 <260>] 60 mss

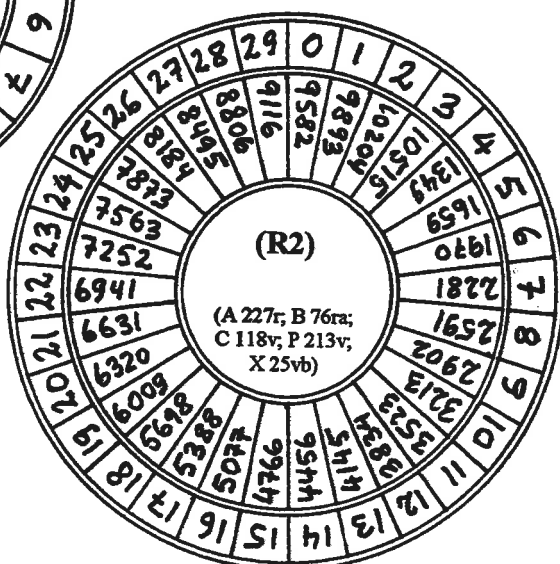
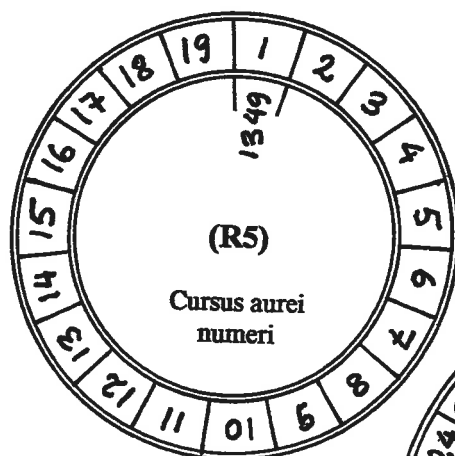
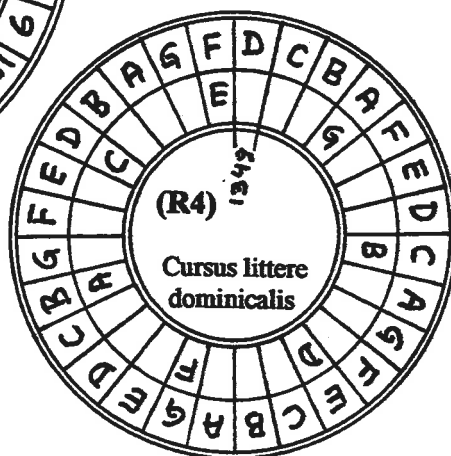
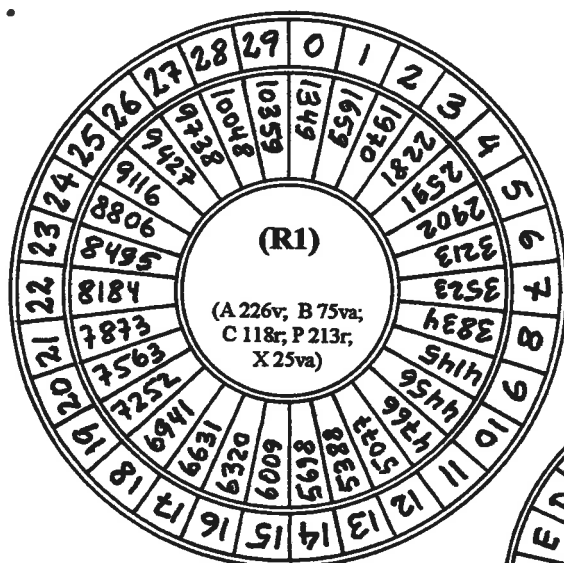
huius rotule novilunium reperiri per hunc modum: Vide in directo numeri anno-
rum vel minoris propinquioris quotus fuerit numerus elongationis quem in
circumferencia huius rotule reperies [R2]. Non oportet ergo nisi tot dies ante
545 aureum numerum quotus est numerus elongationis computare, et in illa die in
qua terminabitur numerus lunam primam pronunciare. Et hoc est quod quidam
dicere volunt, quod videlicet in primis 310 annis et cetera aureus numerus
representavit lunam primam et in aliis 310 annis sequentibus lunam secundam.
Et sic de aliis donec compleatur numerus dierum unius luationis.

550 Adhuc autem multi sunt modi quibus aureus numerus potest corrigi. Qui
determinatius atque precipius ponuntur in libello de correctione aurei numeri
quem ordinavimus de mandato domini nostri, domini Clementis pape sexti,
anno Domini nostri 1345, in civitate Avinione.

555 Numerus autem aureus et littera dominicalis cuiuslibet anni et quota
kalendarum die nonarum vel ydum Pascha debeat celebrari in rotulis et
tabula sequentibus facillime reperiuntur [R4-5, T6]. Et si ecclesia voluerit exire
terminos Paschatis a sanctis patribus institutos nec in kalendario solis aliquid
voluerit immutare, poterit per novilunium Pascha correctum sicut consuevit per
560 numerum aureum quolibet anno reperiri, quoniam Dominica sequente novi-
lunium hic repertum Pascha quolibet anno debet semper celebrari.

544 circumferentia] circumferentiam P || ergo om PX 547 volunt] voluerunt V 547-48 et... annis
om per homeo PX 551 determinatius] determinatus PXAB 553 nostri om V || avinione] hic non
pone rotulam que posita est prius, scilicet 2^a rotula add D 558 per novilunium pascha] pascha per
novilunium V 559 quoniam] quia V





(R2, 0...3)

9582 ... 10515: omnes

| (T1) pro | | | | (T2) ianuario | | | | (T3) | | | | (T4) | | | | | | | | | | | | |
|--|----|---|---|---------------|---|---|----|------|----|----|----|------|----|----|----|----|----|----|----|----|----|----|----|----|
| a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p | q | r | s | t | u | v | w | x | y |
| 19 | 3 | a | t | t | t | t | 3 | a | 19 | 3 | d | 1 | 19 | 8 | 19 | 8 | | | | | | | 2 | 10 |
| 8 | 11 | b | h | h | h | h | 11 | b | 8 | 11 | e | 2 | | 3 | 8 | 16 | 5 | 5 | 13 | 2 | 10 | 10 | 18 | 18 |
| 16 | | c | q | q | q | q | 16 | c | 16 | 5 | 19 | g | 4 | 16 | 5 | 16 | 5 | | 13 | | | | | 7 |
| 5 | 19 | d | e | e | e | e | 5 | d | 5 | 8 | 13 | a | 5 | 5 | 13 | 5 | 13 | 13 | 2 | 2 | 10 | 18 | 18 | 7 |
| 13 | 8 | e | n | n | n | n | 8 | e | 13 | 16 | 19 | b | 6 | 13 | 2 | 13 | 2 | 2 | 10 | | 7 | | 15 | 15 |
| 2 | 16 | f | a | b | b | b | 2 | f | 16 | 5 | 10 | c | 7 | 10 | 2 | 10 | 2 | 10 | 18 | 18 | 7 | 15 | 15 | 4 |
| 10 | 5 | g | b | k | k | k | 5 | g | 10 | 13 | 16 | d | 8 | 9 | 2 | 10 | 2 | 10 | | | 4 | 4 | 12 | 12 |
| 18 | 13 | h | c | s | s | s | 13 | h | 13 | 10 | 19 | e | 9 | 10 | 18 | 10 | 18 | 18 | 7 | 7 | 15 | 4 | 12 | 1 |
| 7 | 2 | i | d | s | g | g | 2 | i | 2 | 13 | 10 | f | 10 | 11 | 18 | 7 | 18 | 7 | 7 | 15 | 4 | 12 | | 9 |
| 15 | 10 | j | e | g | p | p | 10 | j | 10 | 16 | 19 | g | 11 | 13 | 15 | 7 | 15 | 15 | 4 | 12 | 12 | 1 | 9 | 17 |
| 4 | 18 | k | a | p | p | d | 18 | k | 18 | 4 | 18 | h | 12 | 15 | 4 | 15 | 4 | | | | | | | 6 |
| 12 | 7 | l | b | d | d | d | 7 | l | 7 | 7 | 19 | i | 13 | 4 | 12 | | 12 | 12 | 1 | 1 | 9 | 17 | 6 | 14 |
| 1 | 15 | m | c | d | m | m | 1 | m | 15 | 4 | 12 | j | 14 | 1 | 9 | 1 | 9 | 9 | 17 | 17 | 6 | 14 | 14 | 3 |
| 9 | 4 | n | d | e | a | a | 9 | n | 4 | 4 | 19 | k | 15 | 9 | 17 | 9 | 17 | 17 | 6 | 6 | 14 | 14 | 3 | 11 |
| 17 | 12 | o | e | f | i | i | 12 | o | 12 | 9 | 16 | l | 16 | 9 | 17 | 17 | 6 | 6 | 14 | | 3 | 11 | 11 | 19 |
| 6 | 1 | p | a | r | i | r | 6 | p | 1 | 17 | 19 | m | 17 | 12 | 17 | | 17 | 6 | 14 | 14 | 3 | 11 | 11 | 19 |
| | 9 | q | b | f | r | r | | q | | 1 | 19 | n | 18 | 6 | 6 | | 6 | | | 11 | 19 | 8 | 16 | 16 |
| 14 | | r | c | o | f | f | 14 | r | | 9 | 19 | o | 19 | 6 | 14 | 6 | 14 | 14 | 3 | 3 | 19 | 8 | 16 | 16 |
| | 17 | s | d | e | c | c | | s | 17 | 3 | 17 | p | 20 | 14 | 3 | 14 | 3 | 3 | 11 | 11 | 19 | 8 | 16 | 5 |
| 3 | 6 | t | e | f | l | l | 3 | t | 6 | 6 | 19 | q | 21 | 3 | 11 | 3 | 11 | 11 | 19 | 19 | 16 | 5 | 5 | 13 |
| 11 | 14 | u | a | l | t | t | 11 | u | 14 | 19 | 20 | r | 22 | 11 | | 11 | 19 | 19 | 8 | 8 | | 13 | 2 | |
| 19 | 13 | v | b | t | | | 19 | v | 13 | 3 | 31 | s | 23 | 19 | | 19 | | 16 | | 5 | 13 | 2 | | 10 |
| | | w | c | | | | | w | | | | t | 24 | | | | | | | | | | | |
| a | a | | | | | | | a | a | a | n | i | f | m | a | m | i | i | a | s | o | n | d | |
| u | u | | | | | | | u | u | u | u | a | e | a | p | a | u | u | e | c | o | e | | |
| r | r | | | | | | | r | r | r | m | n | b | r | r | i | n | l | g | p | t | v | c | |
| e | e | | | | | | | e | e | e | e | u | r | t | i | u | i | i | u | s | t | o | e | e |
| u | u | | | | | | | u | u | u | r | a | u | i | l | s | u | u | s | e | b | m | m | |
| s | s | | | | | | | s | s | s | u | r | a | u | i | | s | s | t | m | e | b | b | |
| | | | | | | | | | | | s | i | r | s | s | | | | | u | b | r | e | e |
| n | n | | | | | | | n | n | n | u | i | | | | | | | | s | e | r | r | |
| u | u | | | | | | | u | u | u | d | s | u | | | | | | | | | | | |
| m | m | | | | | | | m | m | m | i | s | | | | | | | | | | | | |
| e | e | | | | | | | e | e | e | e | | | | | | | | | | | | | |
| r | r | | | | | | | r | r | r | r | | | | | | | | | | | | | |
| u | u | | | | | | | u | u | u | u | | | | | | | | | | | | | |
| s | s | | | | | | | s | s | s | m | | | | | | | | | | | | | |
| <u>Variants for T1-4</u> | | | | | | | | | | | | | | | | | | | | | | | | |
| pro ianuario om XV heading a: numerus | | | | | | | | | | | | | | | | | | | | | | | | |
| om V heading b: numerus om V | | | | | | | | | | | | | | | | | | | | | | | | |
| heading h: aurerus numerus antiquus om XV | | | | | | | | | | | | | | | | | | | | | | | | |
| heading j: numerus om V heading k: | | | | | | | | | | | | | | | | | | | | | | | | |
| numerus om V col. m contained twice in P | | | | | | | | | | | | | | | | | | | | | | | | |
| 21j: 9 19 AC 24u: 11 add et exp P | | | | | | | | | | | | | | | | | | | | | | | | |
| 25t: 11 1 X 28u: 16 add et exp P 30efg: | | | | | | | | | | | | | | | | | | | | | | | | |
| ttt ccc V 30u: 5 add et exp P 31d: t c V | | | | | | | | | | | | | | | | | | | | | | | | |

Variants for T1-4

pro ianuario om XV || heading a: numerus
om V || heading b: numerus om V ||
heading h: aurerus numerus antiquus om XV
|| heading j: numerus om V || heading k:
numerus om V || col. m contained twice in P
|| 21j: 9] 19 AC || 24u: 11 add et exp P ||
25t: 11] 1 X || 28u: 16 add et exp P || 30efg:
ttt] ccc V || 30u: 5 add et exp P || 31d: t] c V

| (T5) | |
|-------------------|-------------------------------|
| Anni | |
| Incarnationis | Numerus |
| <u>Domini</u> | <u>Correctus</u> ¹ |
| 1349 | 14 |
| 1970 | 6 |
| 2281 | 17 |
| 2902 | 9 |
| 3523 ³ | 1 |
| 3834 | 12 |
| 4456 | 4 |
| 4766 | 15 |
| 5388 | 7 |
| 5698 | 18 |
| 6320 | 10 |
| 6941 | 2 |
| 7252 | 13 |
| 7873 | 5 |
| 8184 ⁵ | 16 |
| 8806 | 8 |
| 9116 | 19 |
| 9738 | 11 |
| 10359 | 3 |

Variants for T5-6

¹ correctus] corrector P

² 13] 12 XV

³ 3523] 3529 PX

⁴ Aprilis] 1 *add* PX

⁵ 8184] 8144 XV

| (T6) | | | |
|-----------------|---|-------------------------------|--------|
| Aureus | | Numerus | |
| <u>Numerus</u> | | <u>Dierum</u> | |
| 16 | | | Martii |
| 5 | d | 11 | 22 |
| | e | 10 | 23 |
| 13 ² | f | 9 | 24 |
| 2 | g | 8 | 25 |
| | a | 7 | 26 |
| 10 | b | 6 | 27 |
| | c | 5 | 28 |
| 18 | d | 4 | 29 |
| 7 | e | 3 | 30 |
| | f | 2 | 31 |
| 15 | g | kalendas Aprilis ⁴ | |
| 4 | a | 4 | 2 |
| | b | 3 | 3 |
| 12 | c | 2 | 4 |
| 1 | d | nonas Aprilis ⁵ | |
| | e | 8 | 6 |
| 9 | f | 7 | 7 |
| | g | 6 | 8 |
| 17 | a | 5 | 9 |
| 6 | b | 4 | 10 |
| | c | 3 | 11 |
| 14 | d | 2 | 12 |
| 3 | e | idus Aprilis | |
| | f | 18 | 14 |
| 11 | g | 17 | 15 |
| | a | 16 | 16 |
| 19 | b | 15 | 17 |
| 8 | c | 14 | 18 |
| | d | 13 | 19 |
| | e | 12 | 20 |
| | f | 11 | 21 |
| | g | 10 | 22 |
| | a | 9 | 23 |
| | b | 8 | 24 |
| | c | 7 kalendas May 25 | |

