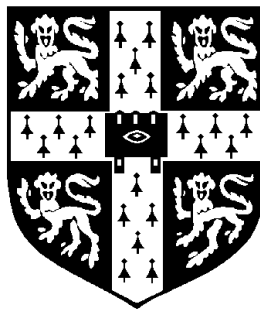


KATHLEEN HUGHES MEMORIAL LECTURES 18

JACOPO BISAGNI

FROM ATOMS TO THE COSMOS:
THE IRISH TRADITION
OF THE DIVISIONS OF TIME
IN THE EARLY MIDDLE AGES



DEPARTMENT OF ANGLO-SAXON, NORSE AND CELTIC
&
HUGHES HALL

UNIVERSITY OF CAMBRIDGE

Kathleen Winifred Hughes (1926-77) was the first Nora Chadwick Reader in Celtic Studies in the University of Cambridge. Previously (1958-76) she had held the Lectureship in the Early History and Culture of the British Isles which had been created for Nora Chadwick in 1950. She was a Fellow of Newnham College, and Director of Studies in both History and Anglo-Saxon, 1955-77. Her responsibilities in the Department of Anglo-Saxon & Kindred Studies, subsequently the Department of Anglo-Saxon, Norse, and Celtic, were in the fields of Irish, Scottish, and Welsh history of the early and central Middle Ages. Her achievements in respect of Gaelic history have been widely celebrated, notably in the memorial volume *Ireland in Early Mediaeval Europe*, published in 1982.

The Kathleen Hughes Memorial Lectures both acknowledge her achievements and seek to provide an annual forum for advancing the subject. The lecture is hosted in Hughes Hall in conjunction with the Department of Anglo-Saxon, Norse, and Celtic. The lecture is published as a pamphlet each year by the Department.

Hughes Hall was founded in 1885 to take women graduating from the universities and give them a one year training to become teachers. Originally called the Cambridge Training College (CTC) it was re-named in 1948 in honour of its first Principal, Elizabeth Phillips Hughes, who had been one of the early students of Newnham College and became a respected leader in the theory and practice of education. E. P. Hughes came from Wales and was a proponent of the language and culture of Wales. But, apart from this Welsh heritage, there is no known connection between the College and the scholar now commemorated in this series of lectures. Hughes Hall became a full college of the university in 2006. Enquiries about entry as a student are always welcome. Information can be found on the college website at <http://www.hughes.cam.ac.uk/prospective-students/graduate-admissions/>

For information on the Department of Anglo-Saxon, Norse, and Celtic, see back cover, as well as our website: www.asnc.cam.ac.uk. Learn more about our activities on Twitter @Department_ASNC.

KATHLEEN HUGHES MEMORIAL LECTURES 18

JACOPO BISAGNI

FROM ATOMS TO THE COSMOS:
THE IRISH TRADITION
OF THE DIVISIONS OF TIME
IN THE EARLY MIDDLE AGES

DEPARTMENT OF ANGLO-SAXON, NORSE AND CELTIC
&
HUGHES HALL

UNIVERSITY OF CAMBRIDGE

From Atoms to the Cosmos: the Irish Tradition of the Divisions of Time in
the Early Middle Ages

© Jacopo Bisagni

First published 2020, by the Department of Anglo-Saxon, Norse and Celtic,
University of Cambridge, 9 West Road, Cambridge, CB3 9DP.

ISBN 978-1-909106-24-6

ISSN 1475-9098

Set in Times New Roman by Professor Máire Ní Mhaonaigh and
Lisa Gold, University of Cambridge.

Printed by the Reprographics Centre, University of Cambridge.

**From Atoms to the Cosmos:
the Irish Tradition of the Divisions of Time
in the Early Middle Ages***

Jacopo Bisagni

National University of Ireland, Galway (Classics) /

Irish Research Council Laureate

1. INTRODUCTION

‘When Irish clergy travelled abroad and made any stay in Gaul or England the Celtic peculiarity which was most troublesome to their hosts was their date for celebrating Easter.’

So begins the chapter ‘Seventh-century controversies’ from Kathleen Hughes’s well-known textbook *The Church in Early Irish Society*, published in 1966.¹ This chapter provided a brief but lucid overview of one of the most intricate controversies ever to beset the early medieval insular world: the Easter controversy of the seventh century, during which the Insular Church saw a radical opposition between three different methods for the calculation of the date of the central event of the Christian calendar. In particular, supporters of the 84-year Easter cycle known as *latercus* struggled for decades against the Victorian and Dionysiac reckonings—two systems based on 19-year lunar cycles—

* The research for this contribution was carried out in the context of the project *Ireland and Carolingian Brittany: Texts and Transmission* (IrCaBritT; 2018–2022), based at the National University of Ireland, Galway and funded by the *Laureate Awards* programme of the Irish Research Council. I wish to thank Sarah Corrigan, Charles Doyle, Paula Harrison, Tobit Loevenich, Dáibhí Ó Cróinín, Jason O’Rorke and Immo Warntjes for their insightful comments and suggestions.

¹ Kathleen Hughes, ‘Seventh-century controversies’, in ead., *The Church in Early Irish Society* (Ithaca NY, 1966), 103–10: 103.

eventually yielding to the Dionysiac reckoning, which gradually spread throughout Britain and Ireland after the Synod of Whitby of 664.²

Like many historians working on early medieval Ireland, Kathleen Hughes came across *computus* (the medieval science of time-reckoning) in the context of the Easter controversy.³ However, while she undoubtedly saw this as an important phase in the history of Irish ecclesiastical *politics*, it is interesting to observe that she does not seem to have considered *computus* as a crucial component of the *intellectual* history of early medieval Ireland: for example, one will look in vain for references to *computus* in the chapter dedicated to ‘Ecclesiastical learning’ in her book *Early Christian Ireland: Introduction to the Sources*, published in 1972.⁴ It is not difficult to see the reason for this apparent

² It is impossible to provide here a full bibliography concerning the insular phase of the Easter controversy. Useful overviews and discussions can be found in Thomas Charles-Edwards, *Early Christian Ireland* (Cambridge, 2000), 391–415; Masako Ohashi, ‘Theory and history: an interpretation of the paschal controversy in Bede’s *Historia ecclesiastica*’, in S. Lebecq, M. Perrin and O. Szerwiniack (eds), *Bède le Vénérable : entre Tradition et Postérité* (Lille, 2005), 177–85; Caitlin Corning, *The Celtic and Roman Traditions: Conflict and Consensus in the Early Medieval Church* (New York, 2006), *passim*; Immo Warntjes, ‘Victorius vs Dionysius: the Irish Easter Controversy of AD 689’, in P. Moran and I. Warntjes (eds), *Early Medieval Ireland and Europe: Chronology, Contacts, Scholarship. A Festschrift for Dáibhí Ó Cróinín* (Turnhout, 2015), 33–97. For an excellent literature review of modern scholarship on *computus* in general, see Immo Warntjes, ‘State of research on Late Antique and Early Medieval Computus’, in I. Warntjes and D. Ó Cróinín (eds), *Late Antique Calendrical Thought and its Reception in the Early Middle Ages (Proceedings of the 3rd International Conference on the Science of Computus in Ireland and Europe, Galway, 16–18 July, 2010)* (Turnhout, 2017), 1–42. For a most useful bibliography of Hiberno-Latin computistical literature, see Donnchadh Ó Corráin, *Clavis Litterarum Hibernensium: Medieval Irish Books & Texts (c. 400 – c. 1600)*, 3 vols (Turnhout, 2017), 667–699.

³ For example, see Kathleen Hughes, ‘Evidence for contacts between the churches of the Irish and English from the Synod of Whitby to the Viking Age’, in P. Clemoes and K. Hughes (eds), *England before the Conquest: Studies in Primary Sources presented to Dorothy Whitelock* (Cambridge, 1971), 49–68.

⁴ Kathleen Hughes, *Early Christian Ireland: Introduction to the Sources* (Cambridge, 1972), 191–216. *Computus* is only mentioned in passing at p. 66 of her contribution ‘Irish monks and learning’, in *Los monjes y los estudios: IV Semana de estudios monásticos, Poblet, 1961* (Poblet, 1963), 61–86. Nevertheless, it is interesting to note that an article dealing with *computus* and aspects of the Easter controversy was included in a multi-author volume dedicated to the memory of Kathleen Hughes: Kenneth Harrison, ‘Episodes in the history of Easter cycles in Ireland’, in D. Whitelock, R. McKitterick, D. Dumville (eds), *Ireland in Early Mediaeval Europe: Studies in Memory of Kathleen Hughes* (Cambridge, 1982), 307–19.

oversight: while on the one hand, most primary sources dealing with the exegetical and political aspects of the Easter controversy were already available or at least known in the 1960s and 70s,⁵ on the other hand, the crucial sources for the technical reconstruction of Irish computistical thought were discovered and/or edited only *after* Kathleen Hughes's premature death in 1977. Indeed, the only extant Easter table revealing the structure of the Irish *latercus* was discovered in 1985 and published in 1988 by Dáibhí Ó Cróinín.⁶ Moreover, while Charles Jones had already been arguing for decades that the computistical works of Bede owed a considerable debt to the Irish computistical tradition,⁷ most of the hard evidence for this was edited, discussed and in some cases discovered only from the 1980s onwards: I am referring in particular to the three Irish computistical textbooks known to modern scholars as *Computus Einsidlensis*, *Munich Computus* and *De ratione computandi*.

⁵ I am of course referring *in primis* to Columbanus's *Epistulae* I and II (ed. and trans. G. S. M. Walker, *Sancti Columbani Opera* (Dublin, 1957), 2–23) and Bede's *Historia ecclesiastica gentis Anglorum*, e.g. II, xix; III, xxv–xxvii; IIII, iiii; V, xv, xxii (ed. and trans. R. A. B. Mynors and B. Colgrave, *Bede's Ecclesiastical History of the English People* (Oxford, 1969); for a more recent ed. and trans. (in Italian), see Michael Lapidge and Paolo Chiesa, *Storia degli Inglesi* (Rome, 2008)). As for Cummian's letter *De controversia paschali*, while its first critical edition and translation were only published in 1988 (Maura Walsh and Dáibhí Ó Cróinín (eds and trans.), *Cummian's Letter De controversia paschali, together with a Related Irish Computistical Tract De ratione computandi* (Toronto, 1988), 55–97), this text was already known beforehand (cf. e.g. James F. Kenney, *The Sources for the Early History of Ireland: Ecclesiastical* (New York, 1929), 220–1, §57) and a rather poor edition of it (based on James Ussher's edition, dating from 1632) could at least be accessed in Migne's *PL*, vol. 87, cols 969–78.

⁶ Ó Cróinín discovered the *latercus* Easter table in the manuscript Padua, Biblioteca Antoniana, I 27. For this important discovery and studies of the *latercus*, cf. especially Daniel Mc Carthy and Dáibhí Ó Cróinín, 'The 'lost' Irish 84-year Easter table rediscovered', in id., *Early Irish History and Chronology* (Dublin, 2003), 58–75 [first printed in *Peritia* 6–7 (1987–8), 227–42]; Daniel Mc Carthy, 'Easter principles and a fifth-century lunar cycle used in the British Isles', *Journal for the History of Astronomy* 24 (1993), 204–24; id., 'The origin of the *latercus* paschal cycle of the insular Celtic churches', *CMCS* 28 (1994), 25–49; Leofranc Holford-Strevens, 'Paschal lunar calendars up to Bede', *Peritia* 20 (2008), 165–208: 178–87.

⁷ Cf. especially Jones's introduction to his 1943 critical edition of Bede's *De temporum ratione* (Charles W. Jones (ed.), *Beda Opera de Temporibus* (Cambridge MA, 1943), 78–113).

Unlike in the case of several exegetical tracts whose Irish authorship remains the object of fierce controversy,⁸ the Irish origin of these computistical textbooks is confirmed—at least in the case of the first two—by the significant occurrence of words and phrases in Old Irish within the main body of the text.⁹ These comprehensive manuals took medieval students through the intricacies of *computus*; moreover, they give *us* access to a wide range of otherwise rare technical concepts and various distinctive Irish features.¹⁰

The relative chronology of these works remains somewhat controversial, so I am following here the sequence that I find the most convincing, namely the one proposed by Immo Warntjes in the introduction to his critical edition of the *Munich Computus* (hereafter *MC*), a text which can be safely dated to AD 718/719. Warntjes argues not only that the author of *MC* knew and used the *Computus Einsidlensis* (hereafter *CE*), which was probably written around AD 700, but also that the author of *De ratione computandi* (hereafter *DRC*) used both

⁸ For a recent overview and assessment of the long-standing debate surrounding Hiberno-Latin exegetical literature, see Mark Stansbury, ‘Irish biblical exegesis’, in R. Flechner and S. Meeder (eds), *The Irish in Early Medieval Europe: Identity, Culture and Religion* (London / New York, 2016), 116–30.

⁹ For editions and discussions of the vernacular elements embedded in these computistical texts, cf. Jacopo Bisagni and Immo Warntjes, ‘Latin and Old Irish in the Munich Computus: a reassessment and further evidence’, *Ériu* 57 (2007), 1–33; eid., ‘The Early Old Irish material in the newly discovered *Computus Einsidlensis* (c. AD 700)’, *Ériu* 58 (2008), 77–105.

¹⁰ So far, only the *Munich Computus* and *De ratione computandi* have been critically edited: cf. Immo Warntjes (ed. and trans.), *The Munich Computus: Text and Transmission. Irish Computistics between Isidore of Seville and the Venerable Bede and its Reception in Carolingian Times* (Stuttgart, 2010); Dáibhí Ó Cróinín (ed.), ‘*De ratione computandi*’, in Walsh and Ó Cróinín, *Cummian’s Letter*, 113–213. The remaining tract, labelled *Computus Einsidlensis* by its discoverer Immo Warntjes, only came to light in 2006 and is still unpublished (the discovery of this text was first announced in Immo Warntjes, ‘A newly discovered Irish Computus: *Computus Einsidlensis*’, *Peritia* 19–20 (2005–6), 61–4; digital images of Einsiedeln, Stiftsbibliothek, 321 are available at <<https://www.e-codices.unifr.ch/en/sbe/0321/1>>); however, a critical edition of this text is currently being prepared by Tobit Loevenich in the context of a research project funded by the Irish Research Council *Laureate Awards* programme and directed by Warntjes at Trinity College, Dublin, entitled *The Irish Foundations of Carolingian Europe (IFCE)*.

CE and *MC* as sources.¹¹ More precisely, Warntjes proposes the following chronological sequence:

CE: composed between AD 689 and 718/719¹²

MC: composed in AD 718/719¹³

DRC: composed between AD 718/719 and 727¹⁴

If we consider the position of these works in the overall chronology of insular computistics, we see that the Irish textbooks were produced towards the end (in the case of *CE*) or immediately after the end (in the case of *MC* and *DRC*) of the most intense phase of the Easter controversy,¹⁵ and immediately before the composition of the work that would later become *the* computistical textbook of the Carolingian age, namely Bede's *De temporum ratione* (hereafter *DTR*), written in 725.¹⁶ Moreover, it should be pointed out that recent discoveries and

¹¹ For the relationship between *CE* and *MC*, cf. Warntjes, *Munich Computus*, CXXXIII–CLII; for the relationship between *CE*, *MC* and *DRC*, cf. *ibid.*, CXCI–CCI.

¹² For the dating of *CE* to the period between 689 and 718/719, cf. Bisagni and Warntjes, 'The Early Old Irish material', 81–91; Warntjes, *Munich Computus*, CLII.

¹³ For the dating of *MC* to 718/719, cf. Warntjes, *Munich Computus*, LVII–LXI.

¹⁴ For the dating of *DRC* to the period between 718/719 and 727, cf. Warntjes, *Munich Computus*, CC. It should be noted that Warntjes's chronology of these works differs markedly from the one proposed by Dáibhí Ó Cróinín, who, in particular, has repeatedly argued for a date of composition of *DRC* around the middle of the seventh century (cf. e.g. Dáibhí Ó Cróinín, 'A seventh-century Irish computus from the circle of Cummiánus', in *id.*, *Early Irish History and Chronology*, 99–130 [first printed in *PRIA* 82 C 11 (1982), 405–30]; *id.*, 'De ratione computandi', 101–5).

¹⁵ I am referring in particular to the final phase of the insular Easter controversy, i.e., roughly, between the Synod of Whitby of 664 and the adoption of the Dionysiac reckoning on the part of the monastic community of Iona in 716 (for this phase of the controversy, see Warntjes, *Munich Computus*, LXXXVII–XCVI; *id.*, 'Victorius vs Dionysius', 63–70).

¹⁶ For the composition of *DTR*, see Jones, *Opera de temporibus*, 135–8. For lists of manuscripts of *DTR*, see *ibid.*, 140–61, and Charles W. Jones (ed.), *Beda Venerabilis Opera, pars VI: Opera Didascalica 2*, CCSL 123 B (Turnhout, 1977), 241–56 (for a more concise account of the manuscript transmission of this text, see Michael Lapidge, 'Beda Venerabilis', in P. Chiesa and L. Castaldi (eds), *La Trasmissione dei Testi Latini del Medioevo / Mediaeval Latin Texts and their Transmission*, vol. 3 (Firenze, 2008), 65–8). For the reception of *DTR* (and Bede's works more generally) in Carolingian schools, see Charles W. Jones, 'Bede's place in medieval schools', in G. Bonner (ed.), *Famulus Christi: Essays in Commemoration of the Thirteenth Centenary of the Birth of the Venerable Bede* (London, 1976), 261–85 [reprinted in *id.*, *Bede, the Schools and the Computus* (Aldershot, 1994), article V]; Faith Wallis (trans.), *Bede: The Reckoning of Time* (Liverpool, 1999), LXXXV–XCVII; Joshua A.

studies have allowed the identification of further Irish computistical works, composed after 725 but prior to the establishment of *De temporum ratione* as the standard reference.¹⁷

If we add all these texts to the dossier of Irish computistical works written between the late sixth / early seventh century (the age of Columbanus) and the early ninth century (Dicuil wrote his difficult *Liber de astronomia* in AD 814–818),¹⁸ it is clear that we are now in a much better position to trace the development of the insular and more specifically Irish computistical tradition over more than two hundred years.¹⁹

Westgard, ‘Bede and the continent in the Carolingian age and beyond’, in S. DeGregorio (ed.), *The Cambridge Companion to Bede* (Cambridge, 2010), 201–15.

¹⁷ For Arno Borst’s discussion and critical edition of the tract labelled by him *Dial. Langob.*, cf. his fundamental *Schriften zur Komputistik im Frankreich von 721 bis 818*, 3 vols (Hannover, 2006), vol. 1, 424–61; for an ascription of this text (written around AD 730) to an Irish author and milieu, cf. Warntjes, *Munich Computus*, CLXXIV–CLXXIX. For the discovery of an Irish computistical tract precisely datable to AD 754 (labelled *Computus Hibernicus Parisinus of AD 754* by its discoverers) in the manuscript Paris, BNF, Lat. 6400B, cf. Immo Warntjes, ‘An Irish eclipse prediction of AD 754: the earliest in the Latin West’, *Peritia* 24–25 (2013–14), 108–15; Jacopo Bisagni, ‘A new citation from a work of Columbanus in BnF lat. 6400B’, *Peritia* 24–25 (2013–14), 116–22 (more will be said below about this text).

¹⁸ For an edition and a discussion of Dicuil’s neglected *Liber de astronomia*, cf. Mario Esposito (ed.), ‘An unpublished astronomical treatise by the Irish monk Dicuil’, *PRIA* 26 (1906–7), 378–446. A new study and an English translation of Dicuil’s work are currently being prepared by Christian Schweizer as part of Warntjes’s *IFCE* project at Trinity College, Dublin (see fn. 10 above).

¹⁹ A tentative chronology of some of the key Irish and English works for the Easter controversy and *computus*, composed between c. AD 600 and the early ninth century, runs as follows: Columbanus, *Epistulae* I and II (c. AD 600); Cummian, *De controversia paschali* (AD 632); Augustinus Hibernicus, *Liber de mirabilibus sacrae scripturae* (AD 654/655); *Computus Cottonianus* (AD 688/689); *De comparatione epactarum Dionysii et Victorii* (AD 689); *Computus Einsidlensis* (AD 689 x 718/719); Irish Victorian Prologue in Bremen, Staats- und Universitätsbibliothek, msc 0046 (AD 699); Bede, *De temporibus* (AD 703); *Munich Computus* (AD 718/719); *De ratione computandi* (AD 718/719 x 727); Bede, *De temporum ratione* (AD 725); *Dial. Langob.* (c. AD 730); Bede, *Historia ecclesiastica gentis Anglorum* (AD 731); *Computus Hibernicus Parisinus* (AD 754); Dicuil, *Liber de astronomia* (AD 814–818). For two excellent long-period overviews of the Irish computistical tradition, see Immo Warntjes, ‘Seventh-century Ireland: the cradle of medieval science?’, in M. Kelly and C. Doherty (eds), *Music and the Stars: Mathematics in Medieval Ireland* (Dublin, 2013), 44–65; id., ‘Computus as scientific thought in Ireland and the Early Medieval West’, in Flechner and Meeder, *The Irish in Early Medieval Europe*, 158–78.

In the present contribution I shall focus on one aspect of *computus* which, in my view, allows us to see particularly clearly the growth of this Irish tradition over a long period of time: namely, the way in which Irish computists sectioned time into a series of units known as *diuisiones temporum*, the ‘divisions of time’.

2. THE DIVISIONS OF TIME

Our modern way of segmenting time into seconds, minutes, hours, and so on, was established relatively late and is mostly a consequence of the advent of mechanised time-keeping from the Late Middle Ages onwards. Yet, many of the units of time we still use today have roots in Antiquity and in the Early Middle Ages.²⁰ Indeed, it is especially important to stress that the very idea of subdividing time is explicitly sanctioned by the Bible: familiarity with the ‘divisions of time’ (*diuisiones temporum*), as well as with the ‘course of the year’ (*anni cursus*) and the ‘arrangements of stars’ (*stellarum dispositiones*), is part of the *scientia uera*, the ‘true knowledge’ bestowed upon Solomon by God, according to the Book of Wisdom.²¹ It is certainly not a coincidence that, at the beginning of the seventh century, Isidore of Seville cited this very passage in the prologue to his cosmological tract *De natura rerum*,²² i.e. the text which,

²⁰ Cf. Bonnie Blackburn and Leofranc Holford-Strevens, *The Oxford Companion to the Year: An Exploration of Calendar Customs and Time-Reckoning* (Oxford, 1999), 661–4 (at p. 663, the authors point out that ‘by the seventh century AD the hour had been divided into smaller units according to a bewildering number of systems’).

²¹ *Liber sapientiae* 7:17–19: *Ipse enim mihi dedit horum quae sunt scientiam veram, ut sciam dispositionem orbis terrarum et virtutes elementorum, initium et consummationem et medietatem temporum, et meditationem omnium morum, mutationes et diuisiones temporum, anni cursus et stellarum dispositiones* (the text cited here—with some added punctuation—is taken from Robert Weber (ed.), *Biblia Sacra iuxta Vulgatam Versionem* (Stuttgart, 1994 [4th ed., revised by Roger Gryson]).

²² Isidore, *De natura rerum*, praef., §2 (ed. Jacques Fontaine, *Isidore de Séville: Traité de la nature* (Bordeaux, 1960), 167): *Quin immo, si ab inuestigatione ueri modis omnibus procul abessent, nequaquam rex ille sapiens diceret: ipse mihi dedit horum quae sunt scientiam ueram, ut sciam dispositionem caeli et uirtutes elementorum, conuersionum mutationes et*

together with the more famous *Etymologiae*, laid the foundations for the development of a specifically Irish tradition of the divisions of time, as has been recently shown in a number of publications by Arno Borst, Eric Graff and Immo Warntjes, whose conclusions I shall briefly summarise.²³

In the first nine chapters of *De natura rerum*, Isidore discusses six units which Irish computists would later adopt as divisions of time: *dies* and *noctes* (days and nights) at chapters I–II, *hebdomades* (weeks) at III, *menses* (months) at IV–V, *anni* (years) at VI, *tempora* (seasons) at VII, and *mundus* (i.e. the whole of the cosmos, which came to be adopted as a division of time in Irish computistical thought presumably because this concept encompassed the totality of time created by God) at IX.²⁴

diuisiones temporum, annorum cursus et stellarum dispositiones (for an English translation of this passage, where, however, the crucial phrase *diuisiones temporum* has been omitted, see Calvin B. Kendall and Faith Wallis (trans.), *Isidore of Seville: On the Nature of Things* (Liverpool, 2016), 107). For a brief discussion of Isidore's use of this biblical passage, cf. Stephen C. McCluskey, 'Astronomies in the Latin West from the fifth to the ninth centuries', in P. L. Butzer and D. Lohrmann (eds), *Science in Western and Eastern Civilization in Carolingian Times* (Basel, Boston MA and Berlin, 1993), 139–60: 150–1. For a recent reassessment of the (controversial) question of the earliest evidence for the Irish reception of Isidore's works (including *De natura rerum*), see Marina Smyth, 'Isidorian texts in seventh-century Ireland', in A. Fear and J. Wood (eds), *Isidore of Seville and his Reception in the Early Middle Ages: Transmitting and Transforming Knowledge* (Amsterdam, 2016), 111–30.

²³ The remaining paragraphs of section 2 of the present work are essentially based on: Arno Borst, *Die karolingische Kalenderreform*, MGH Schriften 46 (Hannover, 1998), 565–73; Eric Graff, 'The recension of two Sirmond texts: *Disputatio Morini* and *De diuisionibus temporum*', in I. Warntjes and D. Ó Cróinín (eds), *Computus and its Cultural Context in the Latin West, AD 300–1200* (Turnhout, 2010), 112–42: 117–25; Warntjes, *Munich Computus*, CXLII–CXLIII.

²⁴ Isidore's definition of *mundus* in *De natura rerum* IX is as follows: *mundus est uniuersitas omnis quae constat ex caelo et terra*. It is worth quoting here *in extenso* Graff's interesting remarks about the concept in question: '*Mundus* is not generally acknowledged in dictionaries as a temporal word, but its tran[s]ference from the spatial 'universe' is logical. Varro had defined *tempus* as an interval of the world's motion (*intervallum mundi motus*; Varro, *De lingua Latina* VI 2, §3 [...]). Since the totality of the world's motion is coterminus with the total space of the world itself, it follows that *mundus* can be used also with a temporal sense, meaning 'all of time'. This assertion is not without philosophical consequence, because it implies that time is not infinite, but rather bounded and created in the same way that space is bounded and created. The Christian utility of this idea is evident' (Graff, 'The recension of two Sirmond texts', 117, fn. 8).

The fifth book of Isidore's *Etymologiae* offers a slightly longer list, with eight divisions. This list differs markedly from the series of units of time treated in the earlier *De natura rerum*:

Tempora autem momentis, horis, diebus, mensibus, annis, lustris, saeculis, aetatibus diuiduntur.

'Intervals of time are divided into moments, hours, days, months, years, lustrums, centuries, and ages.'²⁵

Interestingly, though, this list does not match the divisions of time that Isidore *actually* treated in book V, where we also find chapters dealing with weeks (*hebdomades*, chapter XXXII) and seasons (*tempora*, chapter XXXV). In addition to these, Isidore discussed two further units in book XIII: the already-mentioned *mundus* (at chapter I, *De mundo*; cf. also *Etymologiae*, III, XXIX, *De mundo et eius nomine*) and, more important, the *atomi in tempore*, the 'atoms of time' (at chapter II, *De atomis*), about which more will be said below.

If we now combine the Isidorian categories presented in both *De natura rerum* and *Etymologiae*, we obtain a list of twelve divisions of time: (1) *atomi*, (2) *momenta*, (3) *horae*, (4) *dies* (and *noctes*), (5) *hebdomades*, (6) *menses*, (7) *tempora*, (8) *anni*, (9) *lustra*, (10) *saecula*, (11) *aetates* and (12) *mundus*. The Irish computistical textbooks show that between the late seventh and the early eighth century this list underwent several adjustments. In particular, additional units were introduced at the lower end of the scale, especially in order to facilitate calculations involving small and/or recurrent fractions (and with some biblical support from Isaiah 54:7 and Mark 12:42): *minuta*, *puncta* and

²⁵ Isidore, *Etymologiae*, V, XXIX, 1 (ed. Valeriano Yarza Urquiola and Francisco J. Andrés Santos, *Isidoro de Sevilla: Etimologías, Libro V, De legibus – De temporibus* (Paris, 2013), 87; translation Stephen A. Barney *et al.*, *The Etymologies of Isidore of Seville* (Cambridge, 2006), 125).

quadrantes ('quarter-days').²⁶ Moreover, as far as seasons are concerned, the collocation *uicissitudo triformis* ('threefold alternation', referring to the fact that each season is constituted by three months) sometimes replaced the rather ambiguous term *tempora*, and the obsolete *lustrum* (designating a 'five-year period') was dropped altogether. The result is a list of fourteen divisions: (1) *atomi*, (2) *momenta*, (3) *minuta*, (4) *puncta*, (5) *horae*, (6) *quadrantes*, (7) *dies* and *noctes*, (8) *hebdomades*, (9) *menses*, (10) *tempora* (or *uicissitudines triformes*), (11) *anni*, (12) *aetates*, (13) *saecula*²⁷ and (14) *mundus*.

Interestingly, the various insular texts dealing with this topic reveal that from the late seventh century onwards, the units of time from the 'hour' to the 'year'—i.e. the units most commonly related to the human experience of time—remained rather stable as to their sequence and numerical properties: for this reason, we may call them 'core divisions'. On the contrary, the divisions beneath the *hora* and above the *annus* were subject to a constant reconfiguration: in other words, during the period in question the lower and upper ends of the scale were the focus of intense scholarly debate. However, it should also be stressed that even among the core divisions we see a strong tendency to use the *mensis* ('month') and the *annus* ('year') as springboards for extended discussions of numerous

²⁶ For the rationale behind the introduction of *minuta* and *puncta* in Irish computistics, cf. Warntjes, *Munich Computus*, CXLII, fn. 407; 14–17. The *quadrans* is discussed by Isidore (*Etymologiae*, XVI, XXV, 17), but as a unit of weight, not of time. Borst's brief assessment of the Irish elaboration of a new list of divisions of time is worth citing here: 'Auf biblischer, boethianischer und isidorischer Grundlage errichtete der irische Komputist eine originelle Lehre von den 14 Maßen der Zeit und ihren proportionalen Zahlen' (Borst, *Kalenderreform*, 566).

²⁷ In Isidore's lists, *saecula* precede *aetates* (although in the *Etymologiae* both units are treated within the same chapter, V, XXXVIII). This is the same sequence also found in the lists of divisions of time offered in *CE*, p. 85 (directly cited from Isidore), and *MC* I, 5–7. However, in *MC* the actual discussion of the *aetas* (chapter XLII) precedes that of the *saeculum* (chapter XLIII; this discrepancy is pointed out in Warntjes, *Munich Computus*, 5). The list found at *DRC* 13 (and in several other texts) appears to constitute a secondary and presumably later rationalization, as here the *aetas* comes before the *seculum*, thereby agreeing with the sequence of the chapters in which these units are actually treated (59 and 60).

calendrical matters, such as the etymology of the names of the months or the structure of the 19-year cycle.²⁸

3. THE DIVISIONS OF TIME IN THE THREE IRISH COMPUTISTICAL TEXTBOOKS

At this point, several features of interest also emerge if we compare the Irish computistical textbooks. The following table lists the divisions of time treated in these three works:²⁹

	<i>Computus Einsidlensis</i> (CE)	<i>Munich Computus</i> (MC)	<i>De ratione computandi</i> (DRC)
1	[<i>atomi</i>] (p. 85)	<i>atomi</i> (II)	<i>atomi</i> (16)
2	<i>momenta</i> (pp. 85–6)	<i>momenta</i> (III)	<i>momenta</i> (17)
3	<i>minuta</i> (pp. 86–7)	<i>minuta</i> (IV)	<i>minuta</i> (18)
4	<i>puncta</i> (pp. 87–8)	<i>puncta</i> (V)	<i>puncta</i> (19)

²⁸ For example, in *MC* the chapter about the months (XII, *De mensibus*) is followed by seventeen chapters (XIII–XXVIII) dealing with the names and various traditions associated with the twelve months of the year, the terminology of marker-days (kalends, nones and ides), the calendrical structure of each month, and the relationship between weekdays and the kalends (i.e. the first days) of each month. After that, the treatment of the divisions of time resumes with chapter XXX, *De tempore* ('About the season'), but a new digression begins immediately after the chapter introducing the year (XXXI, *De anno*): this is followed by ten chapters (XXXII–XLI) dealing with a great variety of topics, including the four seasons, the name of the sun in various languages, the alternating increase and decrease of day-time and night-time throughout the year, and the system regulating the intercalation of bissextile days. The divisions of time resume at chapter XLII, *De aetate*.

²⁹ The table lists all the divisions of time to which the Irish textbooks dedicate whole chapters. In the column for *CE*, the page numbers refer to the location of each chapter in the only surviving copy of this text, the manuscript Einsiedeln, Stiftsbibliothek, MS 321 (647), pp. 82–125. In the columns for *MC* and *DRC*, the numbers refer to the relevant chapters defining the terms in question in, respectively, Warntjes's and Ó Cróinín's editions of these texts. As far as *CE* is concerned, the word *atomi* is here written between square brackets because, although briefly discussed, this unit of time is actually not the object of a specific chapter in this textbook, as we shall see below. The words *mensures* and *anni* are printed in boldface in the three columns to highlight the fact that, as mentioned above, these divisions of time act as trigger-points for major digressions.

5	<i>horae</i> (pp. 88–9)	<i>horae</i> (VI)	<i>horae</i> (20)
6	<i>quadrantes</i> (p. 89)	<i>quadrantes</i> (VII)	<i>quadrantes</i> (21)
7	<i>dies</i> and <i>noctes</i> (pp. 89–92)	<i>dies</i> and <i>noctes</i> (VIII–VIII)	<i>dies</i> and <i>noctes</i> (22–5)
8	<i>hebdomades</i> (p. 92)	<i>hebdomades</i> (X)	<i>hebdomades</i> (27)
9	<i>menses</i> (pp. 92–4)	<i>menses</i> (XII)	<i>menses</i> (28)
10	<i>tempora</i> (pp. 94–5)	<i>tempora</i> / <i>uicissitudines</i> <i>triformes</i> (XXX)	<i>tempora</i> / <i>uicissitudines</i> <i>triformes</i> (42)
11	<i>anni</i> (p. 95)	<i>anni</i> (XXXI and XXXVI)	<i>anni</i> (44)
12		<i>aetates</i> (XLII)	<i>aetates</i> (59)
13		<i>saecula</i> (XLIII)	<i>saecula</i> (60)
14		<i>mundus</i> (XLIII)	<i>mundus</i> (61)

As has been suggested by Immo Warntjes, ‘as for the development of the Irish list of 14 divisions of time, it appears [...] that the *Computus Einsidlensis* stands right at the beginning of this process.’³⁰ The first eleven pages of this text in the manuscript (pp. 85–95) offer a detailed discussion of *ten* divisions of time, from the *momentum* to the *annus*.³¹ After the *annus*, this pattern breaks, and the author proceeds to discuss issues such as the structure of the Roman calendar, the relationship between the solar and lunar calendars, the 19-year cycle, and so on.

MC, on the other hand, contains a complete discussion of fourteen divisions, from *atomus* to *mundus*: these fourteen divisions constitute the backbone of the

³⁰ Warntjes, *Munich Computus*, CXLII.

³¹ It is worth pointing out that Bede’s earlier and shorter computistical work, *De temporibus*, written in AD 703 (therefore roughly at the same time as *CE*), offers an even shorter list, with seven divisions, at chapter I: *tempora momentis horis diebus mensibus annis saeculis et aetatibus diuiduntur* (ed. Jones, *Beda Opera Didascalica*, 585). This is plainly copied from Isidore, *Etymologiae*, V, XXIX, 1, minus the obsolete *lustrum*. The same list was given again by Bede in his later *De temporum ratione* (II, 4–5, ed. Jones, *Beda Opera Didascalica*, 274), written in AD 725.

first half of this tract (chapters I–XLV), whereas the second half (chapters XLVI–LXVIII) moves on to more advanced technical matters.

The third textbook, *DRC*, was dated by its discoverer and editor, Dáibhí Ó Cróinín, to the middle of the seventh century. However, as has been pointed out above, *DRC* is the most advanced and in all likelihood the latest of the three textbooks. At first sight, the list of divisions of time presented in *DRC* is identical to that of *MC*. However, there are subtle differences: in my view, the controversial position of the atom in this text illustrates particularly well the relationship between *DRC* and the other two works.

While it is true that *CE* does not contain any section specifically dedicated to the *atomus*, its author nevertheless presented this concept as an interesting idea with potentially useful applicability to computistics. Here is what the text says:

Quid minimum sit numeri quod meruit nominationem specialem? Hoc est momentum. Alii athomum minorem esse contendunt quod falsum non est nam indiuisum interpretaetur.

‘What is the smallest number that deserved to be designated by a specific term? That is the *momentum*. Others [however] argue that the *atomus* is smaller, which is not false: indeed [this word] means ‘undivided’.’³²

MC reveals that by AD 718/719 the concept of *atomus in tempore* (‘atom of time’) had been accepted in computistical circles as a legitimate division of time. Indeed, the author of this text never questions its validity, but simply states:

In tempore uero atomos fit, ut annum diuidis in menses, menses uero in septimanas, septimanas in dies, dies autem in horas, hore uero in momenta, momentum in quandam stillam paruissimam. Inde haec stilla diuidi non potest et atomos dicitur.

³² Einsiedeln, Stiftsbibliothek, MS 321 (647), p. 85; my transcription and translation.

‘In time, [...] an *atomos* results when you divide a year into months, months into weeks, weeks into days, days into hours, hours into *momenta*, and a *momentum* into a certain tiny drop. Then, that drop cannot be divided further and is [therefore] called *atomos*.’³³

Significantly, this text also contains what appears to be the earliest attempt to attribute a precise numerical value to the atom: here, a *momentum* is constituted by fifteen (or possibly sixteen) atoms.³⁴

Yet, in spite of what is said in *CE* and *MC*, the computistical legitimacy of the atom is openly called into question in *DRC*. Initially, the author of this text gives the full list of fourteen divisions, but he also points out that other computists prefer to work on the basis of *thirteen* divisions, ‘as they do not include the atom’.³⁵ The rationale for this rejection is explained at chapter 16:

Sciendum nobis quid sit atomos. Id est nomen Grecum, et indiuisum interpretatur. [...] Sciendum nobis an habet atomos substantiam specialem temporis. Non, nisi substantiam momenti, quia momentum minimum temporis est; quamuis alii dicunt quadragesimam <septimam> partem duodecimae partis momenti habere, quod non est uerum.

³³ *MC* II, 14–18 (ed. and trans. adapted from Warntjes, *Munich Computus*, 10–11). In an unpublished PhD thesis submitted in 2019 to the National University of Ireland, Galway, entitled *Studies in the Latin Christian Reception of Early Greek Materialism*, Charles Doyle has clearly shown that the concept of *atomus in tempore* ultimately depends on Patristic comments (especially Augustine, *Sermo* 362, ed. *PL* 39, col. 1624, l. 55) concerning St Paul’s phrase ἐν ᾧ χρόνῳ (1 Corinthians 15:52), which, interestingly, is translated as *in momento* in Jerome’s Vulgate.

³⁴ *MC* I, 9 (Warntjes, *Munich Computus*, 6–7). The single manuscript copy of *MC* reads *atomos XV in momentum*; however, Warntjes (*Munich Computus*, 11) argues for emending *XV* to *XVI* on the basis of the value found in the *Bobbio Computus* (Milan, Biblioteca Ambrosiana, H 150 inf.; the relevant passage is printed in *PL* 129, col. 1316), and now also in Rome, BAV, Reg.lat.123, fol. 4r (*soluitur [...] momentum in athomos sedecim; sexta decima pars momenti quę diuidi non potest athomos dicitur*). However, the value of 15 atoms in a *momentum* is restated in Firenze, Biblioteca Laurenziana, Plut. 20.54, fols 15r–v (*Momentum in XV partes; quintadecima pars momenti quę diuidi non potest athomos in temperoe [sic, for tempore] dicitur*).

³⁵ *DRC* 13 (ed. Ó Cróinín, ‘De ratione computandi’, 123–4): *Sciendum nobis quot sunt diuisiones temporis. Quattuordecim, que sic nominantur: atomos, momentum, minutum, punctum, hora, quadras, dies, ebdoma, mensis, uicissitudo triformis, annus, aetas, seculum, mundus. Sed tredecim sunt secundum alios, quia atomos non numerant.*

‘We must learn what an *atomos* is. It is a Greek noun, and it means ‘undivided.’ [...] We must know whether the *atomos* has a specific temporal substance. It does not, except for the [same] substance as the *momentum*, given that the *momentum* is the smallest [unit] of time, although others say that the *atomos* consists in the 47th part of the 12th part of a *momentum* [i.e. 1/564th of a *momentum*], which is not true.’³⁶

My reading of the evidence can be summarised as follows: when the author of *CE* wrote his textbook around AD 700, Irish scholars were still developing and discussing the notion of *atomus in tempore* and its applicability to *computus*. This idea must have gained strength during the couple of decades prior to the composition of *MC*, where the *atomus in tempore* is taken for granted. On the contrary, the author of *DRC*, while showing awareness that in the meantime the list of *fourteen* divisions had become the conventional one, did not hesitate to question the received knowledge, arguing for the substantial identity of *atomus* and *momentum* as the smallest unit of time, and also criticising the numerical value that had been attributed to the atom. If this interpretation is correct, then *DRC* must indeed be the *latest* of the three textbooks, thus being roughly contemporary with the composition of Bede’s *De temporum ratione*.

The passage about atoms in *DRC* is important also for another reason. The calculation whereby an atom is defined as ‘the 47th part of the 12th part of a *momentum*’ was plainly borrowed from an earlier source: not only does the author of *DRC* introduce it by means of the phrase *alii dicunt* (‘others say’), but he also openly disagrees with this datum. However, as we have seen, neither *CE* nor *MC* can be the source. The closest textual parallel occurs instead in a fascinating but much neglected Pseudo-Bedan text known as *De diuisionibus temporum*, a scholastic dialogue which contains a discussion of the full list of fourteen divisions of time, with a strong emphasis on etymology and on the

³⁶ *DRC* 16 (ed. Ó Cróinín, ‘*De ratione computandi*’, 126; my translation).

history of the Roman calendar. *De diuisionibus temporum* (hereafter *DDT*) states explicitly that 564 atoms constitute one *momentum*:

Quingenti LXIII athomi unum momentum efficiunt.

‘Five hundred and sixty-four *atomi* constitute one *momentum*.’³⁷

Moreover, we find here the same calculation also outlined in *DRC*, with a verbatim match between the two texts:

A [= *Discipulus*:] *Quomodo est athomus in tempore?*

M [= *Magister*:] *Sic est: momentum diuidis in XII partes; unamquamque partem de XII partibus momenti diuidis in XLVII; quadragesima septima pars duodecima<e> par<tis> est momenti. Sic est athomus in tempore.*

‘Student: “How is the atom of time?”

Teacher: “It is so: you divide a *momentum* into 12 parts; each one of these 12 parts of a *momentum* you divide into 47 [parts]; it is [then] the 47th part of the 12th part of a *momentum*. So is the atom of time”.’³⁸

At this point, could *DDT* be the source used—and criticised—by the author of *DRC*? And if yes, when was it written, and where?

³⁷ Text from Oxford, Bodleian Library, Bodley 309, fol. 64vb (cf. Appendix I below, II.1.2); my translation. The fraction 1/564 occurs in a fairly elaborate calculation of the rate of gradual ‘growth’ of the *saltus lunae* over the 235 lunations of a whole 19-year cycle (cf. Bisagni and Warntjes, ‘The Early Old Irish material’, 102–4; Warntjes, *Munich Computus*, CXXXVI, CXC VII, 6, 10, 272–3; id., ‘Seventh-century Ireland’, 61–2): since this was one of the smallest fractions that Irish computists had to work with, some of them must have thought that time could not be divided any further than this value. Note that, since this datum is already discussed (and rejected) in *DRC* 16 (‘others say that the *atomos* consists in the 47th part of the 12th part of a *momentum*’ = 1/564), we cannot accept Warntjes’s contention that 1/564 ‘may have been first introduced as the numerical value of *atomos* in Carolingian computistics’ (*Munich Computus*, 6). For a brief discussion of the various opinions expressed by Irish computists in relation to the *atomus* and its numerical value, see Borst, *Kalenderreform*, 567.

³⁸ Text from Oxford, Bodleian Library, Bodley 309, fol. 65va (cf. Appendix I below, II.2.8); my translation. A brief discussion of *atomus* in *DDT* can be found in Bernhard Pabst, *Atomtheorien des lateinischen Mittelalters* (Darmstadt, 1994), 69–71, where, however, the author appears to be completely unaware of the text’s Irish affiliations; moreover, Pabst’s indication of AD 820 as the *terminus post quem* for the composition of *DDT* (p. 71) cannot stand, as will be shown below.

4. *DE DIVISIONIBUS TEMPORUM*

Detailed studies of *DDT* are few and far between. In 1939, Charles Jones included an important discussion of it in his book *Bedaes Pseudepigrapha*.³⁹ In an article published in 1943, Alfred Cordoliani discussed a text which, as we shall see, is closely related to *DDT*, namely the *Sententiae in laude compoti*.⁴⁰ In the subsequent decades, *DDT* was mentioned several times: in particular, numerous passages of it have been discussed by Dáibhí Ó Cróinín in his publications.⁴¹ However, it was only in 2010 that Eric Graff reopened the difficult question of this text's transmission in a paper published in the proceedings of the first *International Conference on the Science of Computus in Ireland and Europe*, held at the National University of Ireland, Galway in 2006.⁴² Finally, Immo Warntjes briefly discussed the problem of the position of *DDT* in the development of Irish computistics in his monograph on the *Munich Computus*.⁴³

³⁹ Charles W. Jones, *Bedaes Pseudepigrapha: Scientific Writings Falsely Attributed to Bede* (Ithaca, NY and London, 1939), 48–51.

⁴⁰ Alfred Cordoliani, 'Une encyclopédie carolingienne de comput: les *Sententiae in laude compoti*', *Bibliothèque de l'École des Chartes* 104 (1943), 237–43. For a more recent (and very interesting) discussion of the contents of the *Sententiae* (= *De computo dialogus*), see also Wallis, *The Reckoning of Time*, XXIII–XXV.

⁴¹ Passages from *DDT* are often discussed in the notes to Ó Cróinín's edition of *DRC* (cf. Ó Cróinín, '*De ratione computandi*', *passim*). Cf. also, e.g., Ó Cróinín, 'A seventh-century Irish computus', 102, 107–10, 122–3 (where *DDT* is plainly considered as a component of a larger and partially lost Irish *computus* from AD 658 labelled *De ratione temporum uel de compoto annali* by Ó Cróinín; for arguments against this dating, see below); id., 'The date, provenance and earliest use of the works of Virgilius Maro Grammaticus', in id., *Early Irish History and Chronology*, 191–200 [first printed in G. Bernt, F. Rädle and G. Silagi (eds), *Tradition und Wertung: Festschrift Franz Brunhölz* (Sigmaringen, 1989), 13–22]: 197–8.

⁴² Graff, 'The recension of two Sirmond texts', 112–25, 133–6.

⁴³ Warntjes, *Munich Computus*, *passim* (but see esp. pp. XXVIII–XXIX [fn. 55], L [fn. 115], CLIX–CLX). It is worth mentioning here a striking reference to *DDT* in a popular science book: Carlo Rovelli's *L'Ordine del Tempo* (Milan, 2017; English translation *The Order of Time* (New York, 2018)). In chapter 5, Rovelli (who is a theoretical physicist working in the field of Quantum Gravity) says what follows in the context of a discussion of the concept of *granularity*—according to which time, rather than being a continuous flow, would instead have a quantized nature: 'a minimum interval of time exists. Below this, the notion of time does not exist—even in its most basic meaning. [...] The idea that time could be granular, that

Unfortunately, until now the only edition of this text available in print has been the one contained in volume 90 (cols 653–64) of the *Patrologia Latina*, directly based on Herwagen’s edition of the Bedan (and Pseudo-Bedan) corpus, published in Basel in 1563.⁴⁴ This edition is not only incomplete, missing the four last units of time altogether (*annus, aetas, saeculum, mundus*), but is also extremely faulty and plainly based on a Carolingian recension presenting several interpolations from Bede’s *De temporum ratione*—interpolations which, significantly, are in fact absent from many manuscript copies of *DDT*.⁴⁵

The *PL* edition of *DDT* is preceded by a tract on number theory here called *De computo dialogus* (*PL* 90, cols 647–52): this text survives in many manuscripts, where, however, it is usually entitled *Sententiae sancti Augustini et Isidori in laude compoti*.⁴⁶ Just like in the case of *DDT*, the *PL* edition of the *Sententiae* is unreliable.

A much better copy of both the *Sententiae* and *DDT* is contained in Oxford, Bodleian Library, Bodley 309, an important eleventh-century codex from Vendôme usually known to modern scholars as the ‘Sirmond manuscript’: in an

there could be minimal intervals of time, is not new. It was defended in the seventh century by Isidore of Seville in his *Etymologiae*, and in the following century by the Venerable Bede in a work suggestively entitled *De Divisionibus Temporum*.’ We can certainly forgive Rovelli for trusting the old and certainly spurious attribution of *DDT* to Bede; in my view, what matters here is that this passage from Rovelli’s book is a brilliant example of the great potential of texts such as *DDT* for the creation of new and interesting avenues of communication between modern science and the Humanities. Moreover, this isolated mention is a stark reminder of the fact that much work remains to be done to restore early medieval *computus* to its proper place in the general narrative of the history of Western science. But how can that happen if so many important texts are not even available in print, let alone critically edited?

⁴⁴ Johann Herwagen, *Opera Bedae Venerabilis presbyteri anglosaxonis, uiri in diuinis atque humanis litteris exercitissimi, omnia in octo tomos distincta*, 8 vols (Basel, 1563). We do not know from which manuscript(s) Herwagen took the text of *DDT* printed in his edition.

⁴⁵ For example, none of the Bedan interpolations listed in Jones, *Bedae Pseudepigrapha*, 49, can be found in the earliest copies of the tract (for details of which, see below).

⁴⁶ It is not always clear whether this title refers to *both* the section on number theory *and* the treatment of the divisions of time (i.e. the text normally known as *De diuisionibus temporum*, i.e. the *DDT* ‘proper’), or only to the former. For practical reasons, in the present contribution I shall use the title *Sententiae* to refer to the brief introduction to number theory, and ‘*DDT* proper’ to refer to the detailed discussion of the 14 divisions of time.

important article published in 1937, Charles Jones showed that Bodley 309—which in the seventeenth century was in the possession of the French Jesuit scholar Jacques Sirmond—contains a large collection of computistical texts, many of which were used by Bede as sources for the composition of his *De temporum ratione*.⁴⁷ In 1983, Dáibhí Ó Cróinín argued that this whole collection was originally put together in Ireland in AD 658.⁴⁸ However, further research by Marina Smyth and Immo Warntjes has shown that the compilation of this collection probably took place in several steps, and while on the one hand, the earliest strata were certainly compiled in Ireland in or around 658, on the other, some items of the Sirmond collection should in all likelihood be attributed to Carolingian interventions.⁴⁹

⁴⁷ Charles W. Jones, 'The "lost" Sirmond manuscript of Bede's "Computus"', *English Historical Review* 52 (1937), 204–13 [reprinted in id., *Bede, the Schools and the Computus*, article X].

⁴⁸ Dáibhí Ó Cróinín, 'The Irish provenance of Bede's computus', in id., *Early Irish History and Chronology*, 173–90 [first printed in *Peritia* 2 (1983), 229–47]; cf. also id., 'Bede's Irish computus', in id., *Early Irish History and Chronology*, 201–12.

⁴⁹ Ó Cróinín's dating of the Sirmond compilation to AD 658 is based on a dating clause occurring in a passage preserved in Bodley 309 and other related manuscripts (the so-called 'Sirmond group'): in addition to referring clearly to that specific year, the passage in question also mentions an individual named Suibine mac Commáin, an important seventh-century member of the Uí Fothaid branch of the Déisi: this mention allowed Ó Cróinín to attribute the Sirmond compilation to a south-eastern Irish *scriptorium* (cf. Ó Cróinín, 'The Irish provenance', 176–80). In an article published in 1987, Marina Smyth questioned Ó Cróinín's mid-seventh-century dating of the compilation *as a whole* ('Isidore of Seville and Early Irish cosmography', *CMCS* 14 (1987), 69–102: 94–101), and this criticism subsequently prompted a forceful response from the latter scholar (Ó Cróinín, 'The date, provenance and earliest use', 193–7; cf. also id., 'Bede's Irish computus', 204, and Smyth's brief recapitulation of the question in her *Understanding the Universe in Seventh-Century Ireland* (Woodbridge, 1996), 156–7, fn. 189). More recently, however, Immo Warntjes has presented new evidence suggesting that the compilation of the texts now constituting the Sirmond collection may indeed have taken place in a number of steps, not all of which should necessarily be attributed to seventh-century Irish *literati* (cf. especially Immo Warntjes, 'A newly discovered Prologue of AD 699 to the Easter table of Victorius of Aquitaine in an unknown Sirmond manuscript', *Peritia* 21 (2010), 255–84: 257; id., *Munich Computus*, XXVIII–XXIX [fn. 55], LXXIII–LXXIV; see also the useful synthesis in Kerstin Springsfeld, *Alkuins Einfluß auf die Komputistik zur Zeit Karls des Großen* (Stuttgart, 2002), 68–79). For a recent review of the *status quaestionis*, see Smyth, 'Isidorian texts': 115–18.

Using the Sirmond version of *DDT* instead of the one printed in *PL* is the first necessary step towards a correct comprehension of this text.⁵⁰ At the same time, I must stress that, to the best of my knowledge, *DDT* survives in no less than *twenty-eight copies*, in different configurations:

- 9 witnesses preserve the ‘*DDT* proper’ (i.e. the detailed treatment of the 14 divisions of time) on its own (in its entirety or in part);⁵¹
- 7 witnesses contain the *Sententiae* (on number theory) followed by the ‘*DDT* proper’;⁵²
- in 10 witnesses the *Sententiae* and the ‘*DDT* proper’ are preceded by a prologue (and in a few cases also by a list of *capitula* from a lost computistical compilation), probably added in the Carolingian age;⁵³
- finally, 2 witnesses present the *Sententiae* on their own.⁵⁴

No complete *stemma codicum* of *DDT* has ever been established. However, in his 2010 article Eric Graff has published a preliminary *stemma* for six witnesses, which provides at least a useful starting point.⁵⁵

⁵⁰ For a semi-diplomatic *interim* edition of the copy of the *Sententiae* and ‘*DDT* proper’ contained in Bodley 309, see Appendix I in the present contribution.

⁵¹ For a list of manuscripts, see Appendix II, 1.A below.

⁵² For a list of manuscripts, see Appendix II, 1.B below.

⁵³ For a list of manuscripts, see Appendix II, 1.C below. The prologue and the *capitula* are edited from Oxford, Bodleian Library, MS Bodley 309 in Jones, *Opera de temporibus*, 393–4. It seems that Jones believed that the prologue in question, and the associated table of contents, belonged to a partially lost pre-Bedan ‘Irish Computus’ (*Computus Hibernicus*), which included, among other things, the *Sententiae* and the ‘*DDT* proper’ (for a reconstruction of this convoluted issue and an identification of Jones’s *Computus Hibernicus*, see Warntjes, *Munich Computus*, XXVIII–XIX, fn. 55). Ó Cróinín adopted Jones’s perspective, but referred to this hypothetical Irish computus as *De ratione temporum uel de compoto annali* (cf. Dáibhí Ó Cróinín, ‘Mo Sinu maccu Min and the computus at Bangor’, in id., *Early Irish History and Chronology*, 35–47 [first printed in *Peritia* 1 (1982), 281–95]: 44; cf. also fn. 41 above for further references). However, Warntjes has recently shown (again in *Munich Computus*, XXIX, fn. 55) that the table of contents that precedes the *Sententiae* in several manuscripts of the Sirmond group (and, I would argue, the prologue too), must belong ‘to a late eighth-century Frankish Computus based on Irish material rather than a pre-Bedan Irish text’, as ‘certain chapters listed in that table of contents were not part of Irish computistical teaching of ca. AD 700’.

⁵⁴ For these two manuscripts, see Appendix II, 1.D below.

⁵⁵ Graff, ‘The recension of two Sirmond texts’, 119. According to Graff, Bern 417 and Dijon 448 derive from a node β, while β and the Vatican manuscript Urb.lat.290 go back to a shared

While a full critical edition of *DDT* remains a *desideratum*, the use of the earlier and better version of *DDT* preserved in the Sirmond manuscript prompts a number of considerations. First of all, the contents of this text are perfectly in tune with the sections concerning the divisions of time in the three Irish computistical textbooks. Notwithstanding the fact that even the version contained in Bodley 309 was probably somewhat re-elaborated by Carolingian scholars, there is no doubt that the overall character of the Sirmond *DDT* is distinctively Irish.⁵⁶ Indeed, this text does not seem to exhibit any influence from Bede's computistical works:⁵⁷ for this reason, its composition in all likelihood pre-dates the Irish reception of *De temporum ratione*, which can be tentatively dated to the middle of the eighth century.⁵⁸

It is also important to stress that, in my view, the *Sententiae in laude conpoti* and the '*DDT* proper' must have originally constituted a single cohesive text (or may have been parts of a longer and now partially lost single cohesive text).⁵⁹

node α descending directly from the archetype ω ; the Sirmond manuscript (Bodley 309) and Geneva 50 derive from a shared node δ (showing affinities with the line of transmission leading from α to Urb.lat.290); δ derives from ω , and so does Basel F III 15k. If this *stemma* is correct, then a systematic comparison of the Basel manuscript with the reconstructed sub-archetypes α and δ should give us a good idea of the text of ω . Needless to say, though, a full critical edition will have to take into account the evidence offered by the *twenty-two* remaining witnesses.

⁵⁶ While not containing any words in the vernacular (unlike *CE* and *MC*), *DDT* nonetheless presents countless verbatim and quasi-verbatim parallels with the Irish computistical textbooks, as well as several Irish diagnostic features, such as the (wrong) equation of the terms *quadrans* and *dodrans* (on which cf. Warntjes, *Munich Computus*, CXLVII–CXLVIII, 18–19; Bisagni, 'A new citation', 118), and a pseudo-Jerome quotation according to which the world was created and will be destroyed at midnight (cf. Warntjes, *Munich Computus*, CXXXII, 26–7, and fn. 120 below).

⁵⁷ It is of course impossible to be definitive on this matter in the absence of a critical edition and a thorough source-analysis of *DDT*. Nonetheless, I should stress once again that the Bedan interpolations identified by Jones in the *PL* version of *DDT* are absent in the Sirmond manuscript (cf. fn. 45 above). For the possible presence of Bedan interpolations—probably not belonging to the original recension of *DDT*—in Bodley 309, see Appendix I below, at II.1.2 and II.11 *additum*.

⁵⁸ Cf. Warntjes, *Munich Computus*, LIV (fn. 132); Bisagni, 'A new citation', 121–2 (fn. 22).

⁵⁹ In his *Bedae Pseudepigrapha* (pp. 48–51), Jones treated the *De computo dialogus* (i.e. the text that I refer to as *Sententiae*) and the '*DDT* proper' within the same section, showing that he considered these two works to be closely related to one another; it is indeed clear that Jones considered them as two components of a hypothetical pre-Bedan Irish computus called by him

As has been mentioned above, the *Sententiae* are a dialogue offering a basic introduction to number theory: its various questions and answers deal with the origin and nature of numbers, their discoverers, their different types, their properties, their etymology, their notation, etc. The main sources used are Isidore's *Etymologiae* and, interestingly, the tract *De institutione arithmetica* by Boethius (about which more will be said below). Now, it is not at all surprising that a tract on the divisions of time should begin with a treatment of number theory, given that the practice of starting off computistical tracts with a general introduction to *arithmetica* is not unique to the textual cluster formed by the *Sententiae* and the 'DDT proper'. The *Computus Einsidlensis* begins with four chapters entitled: *De uariis nominibus numeri* (Einsiedeln, Stiftsbibliothek, 321 (647), p. 83), *De difinitione numeri* (p. 84), *De inuentoribus numeri* (p. 84), and *De incrementis numeri* (p. 85). A much shorter but thematically comparable opening can be found in a computistical tract from c. AD 730, which Arno Borst labelled *Dialogus Langobardicus* (*Dial. Langob.*), but which Immo Warntjes has recently argued to be an Irish text (cf. fn. 17 above): this dialogue begins by giving a definition of *arithmetica* as 'the science through which time is distributed and organised',⁶⁰ and this is followed by a concise definition of time which, although ascribed here to Augustine, was in fact probably borrowed from the *Munich Computus*: 'time is a space stretching from the beginning to the end.'⁶¹ The heavily Irish-influenced *Dial. Neustr.* of AD 737 begins with a

Computus Hibernicus and later named *De ratione temporum uel de compoto annali* by Ó Cróinín (cf. fn. 41 and 53 above, and also Springsfeld, *Alkuins Einfluß*, 69).

⁶⁰ *Dial. Langob.* I.A: *Interrogatio: Arithmetica quid est? Responsio: Scientia est, qua tempora dispensantur et ordinantur* (ed. Borst, *Schriften*, vol. 1, 433; my translation).

⁶¹ *Dial. Langob.* I.B: *Interrogatio: Quid est tempus? Responsio: Augustinus dicit: Tempus proprie dicitur spatium extendens ab initio usque ad finem* (ed. Borst, *Schriften*, vol. 1, 433). Cf. MC I, 2–3: *Interrogatio: Tempus, quid est? Responsio: Tempus est spatium tendens de principio usque in finem* (ed. Warntjes, *Munich Computus*, 2–3). As for the fact that this definition is ascribed to Augustine in *Dial. Langob.*, this may be due to the *incipit* of MC, which reads: *Computus sancti Augustini, sancti Hieronimi, sancti Ysidori, sancti Quirilli Graeciae, et ceterorum* (Warntjes, *Munich Computus*, 2–3). Note that a very similar definition of *tempus* also occurs in the Irish-influenced grammatical tract known as *Ars Ambrosiana* (ed. Bengt Löfstedt, *Ars Ambrosiana*, CCSL 133 C (Turnhout, 1982), 115.781–2): "*Tempus*"

section on the origins and the invention of numbers, as well as on the position of *computus* and the study of numbers among the *artes liberales*.⁶² However, the text that offers the closest parallel in this respect is undoubtedly *De ratione computandi*—especially its first twelve chapters. First of all, we find here the same use of some of the same sources also encountered in the *Sententiae*, including Boethius’s *De institutione arithmetica*:⁶³ this is a highly significant match, given that traces of the use of Boethius’s tract before the ninth century are scanty, to say the least.⁶⁴ Moreover, *DRC* presents numerous verbatim

nomen totius mundi aetatis ab initio usque ad finem (I wish to thank Jason O’Rourke for drawing my attention to this passage).

⁶² *Dial. Neustr.* I (ed. Borst, *Schriften*, vol. 1, 381–4).

⁶³ The *Sententiae* share with *DRC* two explicit citations from Boethius’s *De institutione arithmetica*: a citation from I, 2 of Boethius’s tract occurs at fol. 62vb of the Sirmond *Sententiae* (cf. Appendix I below, I.2.2) and at *DRC* 12.2–3; a citation from I, 1 occurs at fol. 63ra (again, cf. Appendix I, I.2.2) of the Sirmond *Sententiae* and at *DRC* 12.5–8. At fol. 63rb (cf. Appendix I, I.3.7), the Sirmond *Sententiae* contain one further citation from *De institutione arithmetica* I, 1, not occurring in *DRC*; in turn, *DRC* (11.6–16) contains a fairly long citation from *De institutione arithmetica* II, 4, not found in the *Sententiae*. This led Ó Cróinín to state what follows (*‘De ratione computandi’*, 122, n. to chapter 11): ‘Though DRT [= *Sententiae*] and our text [= *DRC*] are very similar in wording, I do not believe that there exists a direct dependence of one work on the other. DRT seems, e.g., not to have used Boethius’ book 2.’ Pace Ó Cróinín, this element is not sufficient to exclude an interdependence between these two texts; instead, the fact that each of these two texts contains one independent Boethian citation could simply mean that the authors of the *Sententiae* and *DRC* both had a copy of *De institutione arithmetica* at their disposal.

⁶⁴ For the medieval reception of Boethius’s works pertaining to the *Quadrivium*, see the essays in Michael Masi (ed.), *Boethius and the Liberal Arts: A Collection of Essays* (Bern, 1981); Michael Masi, ‘Boethius’ *De institutione arithmetica* in the context of medieval mathematics’, in L. Obertello (ed.), *Atti del Congresso Internazionale di Studi Boeziani (Pavia, 5–8 ottobre 1980)* (Rome, 1981), 263–72. For a good discussion of the early Irish reception of *De institutione arithmetica*, see Pádraig P. Ó Néill, ‘Boethius in early Ireland: five centuries of study in the sciences’, in Kelly and Doherty (eds), *Music and the Stars*, 21–43: 23–9; in particular, at p. 24 Ó Néill draws attention to the fact that the Sirmond manuscript contains at fols 149r–164r a substantial portion of *De institutione arithmetica*, although I should point out that, since *De institutione arithmetica* does not seem to have been available to Bede when he wrote *De temporum ratione*, this long excerpt from Boethius’s tract may have been added to the Sirmond compilation only after 725. This would indeed solve what has been called ‘a major puzzle’ by Ó Néill (p. 25), namely ‘why he [*scil.* Bede] did not use two works that formed part of that [Sirmond] collection, Boethius’ *D[e] I[nstitutione] A[rithmetica]* and Victorius’ *Calculus*’ (cf. also Ó Cróinín, ‘*De ratione computandi*’, 122, n. to chapter 11: ‘It is curious that Bede, who presumably read these Boethian passages in the computus which he inherited at Jarrow, nowhere cites them in his own works’). Very simply, he did not use these

matches with the *Sententiae*, such as, for example, a fascinating passage attributed to Augustine, outlining a fourfold ecclesiastical curriculum:

Agustinus dixit de quattuor diuisionibus scripture: Quattuor necessaria sunt in ecclesia Dei. Canon diuinus in quo narratur et prædicatur uita futura; Historia in qua gesta rerum narrantur; Numerus in quo facta futurorum et sollemnitates diuine dinumerantur; Grammatica in qua scientia uerborum intellegitur.

‘Augustine said about the four divisions of Scripture: Four things are necessary in the Church of God. The Divine Canon, in which [our] future life is told and preached; History, in which past deeds are narrated; Number, in which future deeds and sacred celebrations are enumerated; Grammar, in which knowledge of words is acquired.’⁶⁵

This passage occurs at the very beginning of the *Sententiae* as well as in chapter 2 of *DRC*: although this citation can be found in a few other sources (usually presenting clear Irish affiliations),⁶⁶ to my knowledge these are the only two occurrences of this passage in a *computistical* context.

works because they had not been added yet to the computistical compilation that came to Wearmouth-Jarrow from Ireland.

⁶⁵ Bodley 309, fol. 62va (cf. Appendix I below, I.1), my translation = *DRC* 2.8–11 (Ó Cróinín, in ‘*De ratione computandi*’, 117, suggests convincingly that this Pseudo-Augustinian citation is based on Augustine, *De Genesi ad litteram* I, 1.1).

⁶⁶ Very similar passages can be found in the *Collectanea Pseudo-Bedae*, §117 (*quattuor uiae sunt lectionis* ‘there are four ways of reading’ etc.; ed. and trans. Martha Bayless and Michael Lapidge, *Collectanea Pseudo-Bedae* (Dublin, 1998), 134, 226), in the Hiberno-Latin *Prebium de multorum exemplaribus*, §80, ll. 221–4 (ed. R. E. McNally, *Scriptores Hiberniae Minores pars I*, CCSL 108 B (Turnhout, 1973), 168), in a medieval *accessus* to Priscian’s *Institutio de nomine, pronomine et uerbo* (in Munich, Bayerische Staatsbibliothek, Clm 6411, fol. 56v), as well as in a curious Carolingian text probably based on the *Sententiae in laude conpoti*, bearing the titles *Sententia Sancti Hieronymi de utilitate grammaticae artis* and *Hec sententia translata est ex dictis Agustini episcopi* (in Munich, Bayerische Staatsbibliothek, Clm 6404, fol. 29v and Rome, BAV, Reg.lat.1283A, fol. 114r; ed. L. Munzi, ‘Testi grammaticali e renovatio studiorum carolingia’, in P. De Paolis, M. De Nonno, L. Holtz (eds), *Manuscripts and Tradition of Grammatical Texts from Antiquity to the Renaissance* (Cassino, 2000), 351–88: 379). An Irish vernacular passage on the ‘four divisions of knowledge of the poetic profession’ (*cethri ranna fesa na filidechta*), plainly based on *quattuor necessaria in ecclesia Dei*, can moreover be found in Daniel A. Binchy (ed.), *Corpus Iuris Hibernici: ad fidem codicum manuscriptorum*, 6 vols (Dublin, 1978), 1106.4–9.

At this point, we possess a number of interesting elements: (1) the *Sententiae* (on number theory) and the ‘*DDT* proper’ (on the divisions of time) are closely related, clearly pre-Bedan texts produced in an Irish milieu, which may indeed constitute a single cohesive tract; (2) there is a striking similarity between the *Sententiae* and the first twelve chapters of *DRC* in terms of themes, sources, and even phrasing; (3) the ‘*DDT* proper’ offers an account of the atom of time which, in spite of being more developed (and probably later) than that found in *MC*, was nonetheless rejected by the author of *DRC*. Taken together, these elements suggest that we might tentatively date the cohesive text constituted by the *Sententiae* and the ‘*DDT* proper’—a text to which I will hereafter refer under the single umbrella-title *Standard DDT* (as opposed to both the *Short DDTs* and the *DDT aucti*, which will be discussed in the next section)—to the narrow chronological window between the composition of *MC* and *DRC*, i.e. around AD 720.

The *Standard DDT* (= *Sententiae* + ‘*DDT* proper’) is far from being a comprehensive computistical textbook: this work deals with relatively few computistical technicalities, and its focus is more terminological and historical. Nevertheless, it is equally clear that this text served a primary didactic need: the fact that both Bede and the authors of the three Irish computistical textbooks resorted to the divisions of time as a major structural pattern for their works⁶⁷ shows that a description of these units was considered to be the best avenue through which a student could be introduced to the subtleties of the Christian calendar.

⁶⁷ Cf. Warntjes, *Munich Computus*, CVII–CXVIII.

5. *SHORT DDTs* AND *DDT AUCTI*

The prominent position of the divisions of time in early medieval computistical training, not only in Ireland but in Carolingian schools too, is confirmed by the fact that the *Standard DDT* generated a long series of shorter didactic texts, stripped of all details and only presenting the most essential information. So far, I have identified no less than ten such *Short DDTs*, distributed across twenty-one manuscript witnesses.⁶⁸ To this number we should add twenty-two further manuscripts containing various *excerpta* from, or related to, *DDT*.⁶⁹ Many of these *Short DDTs* and *excerpta* can be found in single manuscript copies and usually represent idiosyncratic epitomes of the larger *Standard DDT*. However, a few of these texts are extant in multiple copies, probably as a direct consequence of their didactic value. A good example of this is the text that I have labelled *Short DDT 3*, surviving in six witnesses (cf. Appendix II, 2.C below). It is a very short text, which in its earliest copy—Paris, BNF, Lat. 5543, a manuscript written at Fleury in AD 847—occupies only about half of fol. 126r:⁷⁰

⁶⁸ For a list of the ten *Short DDTs* and their manuscripts, and a brief description of their main respective features, see Appendix II, 2 below. It is important to stress that the number of divisions treated in these ten tracts fluctuates considerably, especially because different teachers appear to have taken different stances in relation to the smallest and the greatest units of time.

⁶⁹ For a list of manuscripts contain passages from, or related to, *DDT*, see Appendix II, 3 below (note that I certainly do not consider this list to be exhaustive, and that in all likelihood many additional manuscripts containing short tracts on the divisions of time or excerpts from *DDT* will be identified in the future). I note here in passing that St Gall, Stiftsbibliothek, 913 (s. VII^{ex}–VIIIⁱⁿ, Murbach?), pp. 80–6, contains materials related to the divisions of time, but rather distant from the tradition of *DDT* and the Irish computistical textbooks (I thank Immo Warntjes for drawing my attention to this manuscript). I should finally mention eight manuscripts that I have not been able to see yet, but which, based on the information found in catalogues and databases, probably contain further copies of *DDT* or in any case materials related to *DDT*: (1) Madrid, Bibl. Nacional, 17823; (2) Madrid, Bibl. Nacional, 17961; (3) Montecassino, Archivio della Badia, 230; (4) Rome, BAV, Reg.lat.1855; (5) Toledo, Biblioteca Capitular, 47-15; (6) Tortosa, Bibl. de la Santa Iglesia Catedral, 10; (7) Zürich, Zentralbibliothek, Car. C 176; (8) Zürich, Zentralbibliothek, Car. C 180.

⁷⁰ For a description of Lat. 5543, cf. Borst, *Schriften*, vol. 1, 270–1.

A digital facsimile of this manuscript is available at the URL

<<https://gallica.bnf.fr/ark:/12148/btv1b10502052p.r=Latin%205543?rk=42918;4>>.

DE DIUISIONIBUS TEMPORUM. Diuisiones temporum sunt XIII, id est athomus, momentum, minutum, punctum, hora, quadrans, dies, ebdomada, mensis, uicissitudo triformis, annus, aetas, seculum, mundus. DLXIII athomi unum momentum efficiunt; quattuor momenta minutum complent; duo minuta et dimidium punctum faciunt; quattuor puncti unam horam in sole efficiunt; VI horae quadrantem complent; quattuor quadrantes unum diem; VII dies ebdomadam faciunt; <quattuor septimanae mensem faciunt;>⁷¹ tres menses uicissitudinem triformem IIII temporum, id est ueris, aestatis, autumnus, et hiems. Haec IIII tempora quae habent XII menses annum efficiunt; quattuor anni cyclum bissextilem faciunt; XV anni cyclum indictionalem efficiunt; XVIII anni cyclum decennouenalem perficiunt, sic XVIII cyclum lunarem faciunt; XXVIII anni cyclum solarem complent percurrentes donec in se reuertantur; DXXXII anni cyclum magnum faciunt quando secundum solem et lunam et bissextum et saltum in unum diem mensis et in unum diem septimanae in eadem luna omnes cycli in unum conueniunt. Aetas, sicut dicitur VI aetates saeculi. Seculum autem est totum spatium ab initio mundi usque ad finem. Mundus uero est uniuersitas quae constat caelo, terra et mari.

‘ABOUT THE DIVISIONS OF TIME. There are 14 divisions of time, i.e. atom, moment, minute, *punctum*, hour, quarter-day, day, week, month, threefold alternation, year, age, *saeculum*, cosmos. 564 atoms constitute one moment; 4 moments complete one minute; 2½ minutes make one *punctum*; 4 *puncti* constitute one hour according to the sun; 6 hours complete one quarter-day; 4 quarter-days [constitute] one day; 7 days make one week; 4 weeks make one month; 3 months [constitute] the threefold alternation of the 4 seasons, i.e. spring, summer, autumn and winter. These 4 seasons, which have 12 months [in total], constitute one year; 4 years make a bissextile cycle; 15 years make an indiction-cycle; 19 years make a decemnouenal cycle, as well as a lunar cycle; 28 years complete a solar cycle, running until they repeat themselves; 532 years make a great cycle, when all the cycles converge on the same day of the month, the same weekday and the same day of the moon, in agreement with the sun, the moon, the bissextile day and the *saltus*. [The term] ‘age’ [is used] like when one refers to ‘the six ages of the world’. The *saeculum*, indeed, is the whole space [stretching] from the beginning of the world until its end. The cosmos, then, is everything (*uniuersitas*), and it consists in the sky, the earth and the sea.’

⁷¹ Supplied from Cambridge, Corpus Christi 291, fol. 123v, Reg.lat.1260, fol. 117r, and Reg.lat.1038, fol. 126r. This phrase is missing in Lat. 5543, Lat. 5239 and Strasbourg 326.

Needless to say, on account of their shortness the scope of these texts is rather limited: their main function was to provide a straightforward *aide-mémoire* for the rote learning of the divisions of time and their quantity.

However, the *Standard DDT* also generated a far more interesting category of texts: I have recently identified four tracts that *expand* on the contents of the *Standard DDT*, offering an in-depth discussion of each division of time, with a perspective that often embraces other areas of medieval learning such as grammar and biblical exegesis. These texts, which I have labelled respectively *DDT aucti* 1, 2, 3 and 4, are distributed across nine manuscripts ranging in date from the early ninth to the eleventh century.⁷² The addition of these further nine manuscripts brings the total number of witnesses for *DDT* and its related texts to *eighty*—a striking figure, which I expect will only keep growing through further

⁷² **DDT AUCTUS 1** (the following two manuscripts are not copies of the same text, but rather two different recensions of it: Laon 422 preserves what appears to be an incomplete series of long *excerpta* on the divisions of time copied rather faithfully from an original Irish *DDT auctus*, while Cologne 83-II seems to offer an epitomised version of it, which however—unlike Laon 422—treats all the divisions of time from *atomus* to *mundus*): (1) Cologne, Dombibliothek, 83-II (AD 805, Cologne), fols 15r–28v; (2) Laon, Bibliothèque Municipale, 422 (s. IX^{1/3}, area of Corbie?). **DDT AUCTUS 2** (1 MS; this is a tract entitled *De nominibus temporum et diuisiones eorum*; 14 divisions are listed, but only 9 are actually treated, from *atomus* to *mensis*): Karlsruhe, Badische Landesbibliothek, Aug. perg. 229 (AD 806 x 821, Santo Stefano in Lucana), fols 32v–44r. **DDT AUCTUS 3** (5 MSS; a text rather close to the *Standard DDT*, but listing 16 divisions of time: the *cyclus* is added after the *annus*, and the *uicissitudo triformis*, ‘season’, is listed, strangely, between the *cyclus* and the *saeculum*, while *tempus*—another term for ‘season’—is correctly placed between the *mensis* and the *annus*; only the divisions from *atomus* to *mensis* are actually treated): (1) London, British Library, Sloane 263 (s. XI, Lyon), fols 17r–19v (ending abruptly with an incomplete discussion of the calends—a subsection of *de mense*); (2) Madrid, Biblioteca Nacional, 9605 (AD 1026, Provence), fols 98ra–99va (from *atomus* to *mensis*); (3) Paris, BNF, Lat. 528 (s. X, Limoges), fols 72r–76r (from *atomus* to *mensis*); (4) Paris, BNF, Lat. 894 (s. IX, Loire Valley?), fols 41v–44v (incomplete text stopping at the section about the night, probably due to the loss of some folios); (5) Paris, BNF, Lat. 2183 (s. XI, France), fols 119r–122r (from *atomus* to *mensis*; rather close to Lat. 894). **DDT AUCTUS 4** (1 MS; a dialogue starting with a discussion of the *atomus* and ending with a discussion of weekdays and the month of January): London, British Library, Harley 3017 (s. IX, Fleury), fols 182v–185v (for a more concise list of manuscripts containing the *DDT aucti*, see Appendix II, 4 below). At least some of these texts may have grown by incorporating into the *Standard DDT* interlinear and marginal *scholia* that offered additional details about each division of time: the glosses and *marginalia* to the copy of *DDT* contained in Rome, BAV, Urb.lat.290 are a good example of how this might have happened (cf. e.g. the long marginal *addendum* on the various *genera momenti* at fol. 35v).

research.⁷³ There is thus no doubt that the divisions of time were a major component of the early medieval scientific curriculum, a component worth studying in detail, especially since the process of composition of texts such as the *DDT aucti* poses interesting questions regarding the labels of ethnicity that get applied by modern scholars to medieval texts. If on the one hand, there is practically no doubt that the *Standard DDT* is a Carolingian recension reflecting more or less faithfully an early eight-century *Irish* treatise on number theory and the divisions of time, on the other, it is very difficult to determine in what measure the undoubtedly later epitomised and augmented texts can also be described as ‘Irish’.

A concrete example should help clarify what I mean. The Karlsruhe manuscript Aug. perg. 229 is a liturgical and computistical miscellany written between AD 806 and 821 at the monastery of Santo Stefano in Lucana, near Chieti in central Italy, whence it came to the library of Reichenau in AD 822.⁷⁴ At fols 32v–44r (which belong to the first codicological unit), this manuscript contains an incomplete and still unpublished *DDT auctus*, many sections of which offer lengthy discussions of terminological and exegetical aspects concerning the divisions of time, not occurring in the *Standard DDT*.⁷⁵

Although the contents of this work are essentially compatible with the treatment of the divisions of time found in the Irish computistical textbooks and in the *Standard DDT*, is this enough to call this an ‘Irish’ text? I would argue

⁷³ The overall count rises to eighty-eight if one adds the eight manuscripts mentioned at the end of fn. 69 above (note that I do not include St Gall, Stiftsbibliothek, 913 in this tally).

⁷⁴ For a thorough discussion of the manuscript’s date, place of writing and strikingly rapid transfer to Reichenau, see the excellent study by Mario Tedeschi, ‘Un centro scrittoria nell’Abruzzo franco. Il Ms. Aug. Perg. 229 e il monastero di S. Stefano in Lucana’, *Bullettino dell’Istituto Storico Italiano per il Medio Evo* 116 (2014), 1–23.

⁷⁵ A few examples are: the distinction between *momentum maximum* and *momentum minutum* at fol. 34r; the definition of *punctum* according to the *geometrici* at fols 34v–35r; the distinction between *horae naturales* and *horae artificiales* at fol. 35v; the description of the *horologium* (here also spelt *horelegium* and *horalegium*) at fols 35v–36r; the discussion of the creation of light and darkness in the section *de die* at fols 37r–v. A digital facsimile of this manuscript is available on-line and can be viewed at <<https://digital.blb-karlsruhe.de/blbhs/Handschriften/content/titleinfo/20821>>.

not. This work may well have been composed in Francia or Italy during the second half of the eighth century by a scholar who relied on sources which, although ultimately of Irish origin, nevertheless enjoyed wide circulation on the Continent, such as the *Standard DDT*. As a consequence, in the absence of more conclusive evidence, this *DDT auctus* can at best be described as ‘Irish-influenced’, and the same consideration conceivably applies to the numerous *Short DDTs* that have been discussed above: many of them—perhaps *all* of them—may have been composed in continental rather than Irish *scriptoria*.⁷⁶ But then, is there any explicit evidence that Irish scholars kept working on the divisions of time even after the composition of *DRC* and the *Standard DDT*, i.e. after *c.* AD 720? And is there any evidence indicating that this computistical tradition may have sometimes remained *recognisably* Irish even outside of Ireland? In my view, the short answer to both questions is yes.

As far as the first issue is concerned, we now possess an unquestionably Irish *DDT auctus*: this is the tract which I have labelled *DDT auctus* 1, and which I discovered in 2016 in Laon, Bibliothèque Municipale, 422, an impressive manuscript written in the early ninth century in a monastery of Northern Francia, possibly in the area of Corbie, Cambrai or Péronne.⁷⁷ This codex contains a large

⁷⁶ One might argue that similar objections could be raised against the identification of the *Standard DDT* as an Irish work. However, the chronology offers crucial assistance in this respect: as we have seen above, there are good reasons to think that the *Standard DDT* was written around AD 720, i.e. *after* the composition of *MC* but *before* the composition of both *DRC* and Bede’s *De Temporum Ratione* (*DTR*). The earliest known computistical textbook certainly written in Francia is the *Dial. Burg.* of AD 727 (cf. Borst, *Schriften*, vol. 1, 348–74); although heavily influenced by Irish sources (cf. Warntjes, *Munich Computus*, CLXXI–CLXXII), the overall character and structure of this text are completely different from both the Irish textbooks and the *Standard DDT*: for example, the divisions of time play no major structural role in *Dial. Burg.* Thus, while on the one hand, the contents of the *Standard DDT* are perfectly ‘at home’ in Ireland around AD 720, on the other, they would be completely out of place within the landscape of early eighth-century *Frankish* scientific literature. On the contrary, since both the *Short DDTs* and the *DDT aucti* are plainly derivative and therefore somewhat later works, it is not inconceivable that some of them may have been composed in Francia or Italy between, say, the mid-eighth and the early ninth centuries.

⁷⁷ On this manuscript, see especially Barbara Obrist, ‘Les manuscrits du *De cursu stellarum* de Grégoire de Tours et le ms Laon, Bibliothèque municipale 422’, *Scriptorium* 56 (2002), 335–44; Bernhard Bischoff, *Katalog der festländischen Handschriften des neunten*

scientific encyclopaedia of 48 folios, bearing the heading *In nomine Dei summi incipit de astronomia* (fol. 22v). *De astronomia* is a large collection of *excerpta* taken from a great variety of sources, one of which was certainly an Irish tract on the divisions of time, longer and much more detailed than the *Standard DDT*. Laon 422 contains chapters for only eleven divisions of time, from the *atomus* to the *annus*,⁷⁸ with no mention of *aetates*, *saecula* and *mundus*: this suggests that the *DDT auctus* from which the scribe of Laon 422 took these excerpts was not copied in its entirety, however—a conclusion supported by the fact that the apparently epitomised recension of the same text preserved in the famous codex Cologne, Dombibliothek, 83-II (cf. fn. 72 above) does contain chapters dedicated to the last three divisions of time at fols 26r–v.⁷⁹

The Irish origin of this text is proven not only by its countless textual affiliations with Hiberno-Latin computistical and exegetical sources, but also—and more cogently—by the occurrence of three words in Old Irish within the main body of the text. Thus, at fol. 39v the Old Irish words *or* and *imbel*, both meaning ‘edge, border’, are used to clarify and strengthen a linguistic distinction between Latin *hora* (‘hour’) and *ora* (‘edge, limit’).⁸⁰ Moreover, at fol. 49v the Latin/Old Irish bilingual phrase *forma coirthe* (‘the shape of standing stones’) is

Jahrhunderts (mit Ausnahme der wisigotischen), 4 vols (Wiesbaden, 2004), vol. 2, 34 (§2114–5); Borst, *Schriften*, vol. 1, 238–9; D. Blume, M. Haffner and W. Metzger, *Sternbilder des Mittelalters. Der gemalte Himmel zwischen Wissenschaft und Phantasie*, 2 vols (Berlin and Boston MA, 2012–2016), vol. 1, 274–9; Anna Santoni, ‘*De signis coeli* and *De ordine ac positione stellarum in signis*: two star catalogues from the Carolingian age’, in F. Pontani (ed.), *Certissima signa. A Venice Conference on Greek and Latin Astronomical Texts* (Pisa, 2017), 127–44.

A high-quality digital facsimile of this manuscript can be viewed on the *Gallica* website at the URL <<https://gallica.bnf.fr/ark:/12148/btv1b8492138z.r=Laon%20422?rk=21459;2>>.

⁷⁸ More specifically, the divisions treated here are: *atomus*, *momentum*, *minutum*, *punctum*, *hora*, *quadrans*, *dies* (and *nox*), *ebdomada*, *mensis*, *tempus*, *annus*.

⁷⁹ A digital facsimile of Cologne 83-II can be accessed on the website <<http://www.ceec.uni-koeln.de/>>.

⁸⁰ The fact that Old Irish *or* and *imbel* are offered here as translations of Latin *ora* may also suggest that the author was thinking in terms of a cross-linguistic etymological rapprochement between Old Irish *or* and Latin *ora*. Etymology is indeed one of the main concerns of this anonymous Irish computist.

used to elucidate Latin *formola* ('image made in a mould' / 'small shape'), a term occurring in the context of a complex etymology of the calendrical term *idus* ('ides') ultimately based on Isidore's *Etymologiae* (VIII, XI, 13).

Even aside from the presence of Old Irish words, Laon 422 contains an extraordinary number of fascinating passages: for example, we find here discussions concerning the names of the sun in various languages (fol. 33v), the theological nature of darkness (fols 42v–43r), the etymology of *tempus* (fols 49v–50r), and even a brief text (attributed to Augustine!) describing the strange places that the sun visits during its night-journey before fighting a daily battle against the Leviathan—the monster of the abyss who triggers the movement of the tides by rhythmically swallowing and vomiting enormous amounts of seawater (fol. 53v).⁸¹ However, there is one element that makes this manuscript *especially* important: the occurrence of the phrase *tithis turgescens dodrantem* at fol. 41r. This 'Hisperic' phrase, which can be translated approximately as 'the powerful rising tide of the swelling Ocean', occurs in the chapter concerning the *quadrans*, the 'quarter-day' (fols 40v–41v), where it is attributed explicitly to a *prologus* written by a certain *Colmanus Niger*, 'Colmán the Black'.⁸² This attribution matches another occurrence of this same phrase in Paris, BNF, Lat. 6400B: this manuscript, copied at Fleury-sur-Loire from a lost Breton exemplar during the first half of the tenth century, contains an Irish computistical tract which Immo Warntjes and I discovered in 2013, and which can be dated

⁸¹ A full treatment of the extraordinary contents of Laon 422 exceeds by far the limits of the present contribution. However, I am currently preparing two articles, dealing respectively with (1) the Irish affiliations of *DDT auctus* 1 (including the presence of words in the vernacular) and (2) the short tract concerning the sun's night journey. Moreover, Ms Paula Harrison is preparing a critical edition of *De astronomia* in the context of a PhD linked to the research project *Ireland and Carolingian Brittany: Texts and Transmission* (IrCaBriTT), funded by the *Laureate Awards* programme of the Irish Research Council and directed by the present writer at National University of Ireland, Galway.

⁸² The relevant passage at fol. 41r reads as follows: *dodras maior nouem untias habet, dodras uero minor tria puncta habet, ut in tractatu Iob dicitur 'dodrantem maris transmissio' hoc est tribus punctis transmissis, et ut dicitur in prologo Colmani nigri pfuli [sic!] 'et tithis turgescens [corrected into turgescens] dodrantem' hoc est tria puncta.*

precisely to AD 754—hence the title we gave it: *Computus Hibernicus Parisinus of 754*.⁸³ In Lat. 6400B, fol. 277v, the Hisperic phrase in question is attributed to a *prologus columna nigri*, which is obviously a garbled reading. In an article published in 2014, I argued that this corrupt ascription should be understood as a reference to a *prologus Columbani*, possibly a lost work written by Columbanus before he left Ireland in the late sixth century.⁸⁴ While the question of the attribution of this *prologus* to Columbanus would take us too far from our main subject, it is important to point out at least that the subsequent discovery of the phrase *tithis turgescantis dodrantem* in Laon 422 confirmed the attribution of this citation to an Irish author—whoever *Colmanus Niger* may be. Moreover, the obvious affinity between the *DDT auctus* of Laon 422 (= *DDT auctus* 1) and the *Computus Hibernicus Parisinus* strongly suggests that these two tracts may have been composed in the same milieu (perhaps the same Irish *scriptorium*?) and within the same chronological horizon, namely the middle of the eighth century.

Over the past few years, I have been able to identify further occurrences of the diagnostic phrase *tithis turgescantis dodrantem* in copies of an *argumentum*—i.e. a computistical algorithm—probably composed in Brittany in the early ninth century.⁸⁵ The two earliest witnesses for this *argumentum* point to transmission from Brittany to the Loire Valley within the first half of the ninth century.⁸⁶ Moreover, the discovery of two further copies dating from the eleventh century, one from Catalonia and one from England, indicate that this

⁸³ For a discussion of this text's date, cf. Warntjes, 'An Irish eclipse prediction of AD 754'.

A digital facsimile of Lat. 6400B is available at
<https://gallica.bnf.fr/ark:/12148/btv1b525072333.r=Latin%206400B?rk=42918;4>.

⁸⁴ Cf. Bisagni, 'A new citation'.

⁸⁵ Cf. Jacopo Bisagni, 'The newly-discovered Irish and Breton *computistica* in Città del Vaticano, BAV, MS Reg. Lat. 123', *Peritia* 28 (2017), 13–34.

⁸⁶ The two witnesses in question are: Paris, BNF, Lat. 5543 (AD 847, Fleury), fol. 115v; Rome, BAV, Reg.lat.1260 (s. IX, Loire Valley), fol. 119v.

argumentum eventually enjoyed a wider European circulation, probably thanks to the intermediary role of the prestigious *scriptorium* of Fleury.⁸⁷

The distribution of this Hisperic phrase (and its associated computistical materials) enables us to propose a tentative reconstruction of a network of textual transmission articulated into three broad phases:

(1) a first phase which sees (a) the composition of the *Computus Hibernicus Parisinus* and *DDT auctus* 1 in Ireland around the middle of the eighth century, and (b) their transmission to Brittany and Northern Francia, roughly between AD 750 and 850;

(2) a second phase, datable to the period between *c.* AD 850 and 950, during which this process of transmission converged upon Fleury and the Loire Valley;

(3) a third phase, datable to the first half of the eleventh century, during which the *scriptorium* of Fleury facilitated the diffusion of these ‘Hiberno-Breton’ computistical materials both southwards (to Catalonia) and northwards (to England).⁸⁸

In a nutshell, the *Computus Hibernicus Parisinus* of 754 and *DDT auctus* 1 demonstrate that Irish computists kept developing their thought concerning the divisions of time at least up to the middle of the eighth century. Moreover, the continental transmission of these texts indicates that Brittany and the Carolingian monasteries of the Loire Valley may have played a crucial role in the diffusion of Irish *computistica*—and perhaps other genres too—between the late eighth and the early ninth centuries.⁸⁹

⁸⁷ The Catalan copy of the *argumentum* mentioning the phrase *tithis turgescens dodrantem* is in Rome, BAV, Reg.lat.123 (AD 1055, Ripoll), fol. 77r. The English copy is in Cambridge, Corpus Christi College, 291 (*c.* AD 1065, Canterbury), fol. 125v.

⁸⁸ The analysis of this computistical corpus and the network of its manuscript transmission are at the heart of the IrCaBriTT research project, currently ongoing at National University of Ireland, Galway (see fn. 81 above).

⁸⁹ On this topic, see also Warntjes, *Munich Computus*, CIV–CVI, CLXXXIII–CLXXXVII.

6. ADOMNÁN OF IONA AND THE DIVISIONS OF TIME

I must now return to an important question, only mentioned in passing in section 5 above: when Hiberno-Latin scientific texts reached continental *scriptoria*, did they preserve any recognisable indicators of their Irish origin, or did they merge entirely with the ‘mainstream’ of Carolingian scholarship? It is likely that in most cases the latter happened. The large majority of Hiberno-Latin *computistica* preserved in Carolingian manuscripts present no overt signs whatsoever flagging their Irish origin. That such an origin is apparent to *us* is an achievement of modern philology and *Quellenforschung*, whereas presumably this fact would have been neither detectable nor particularly relevant for the early medieval continental *literati*. Yet, I shall now present and discuss one surprising piece of evidence which points in the opposite direction.

Karlsruhe, Badische Landesbibliothek, Aug. perg. 167 (AD 834 x 848; hereafter *K*) is the famous manuscript that contains the largest surviving corpus of Old Irish glosses to Bede’s scientific works.⁹⁰ The origin of *K* is a complex and controversial issue which would deserve a much longer treatment than can be given here. Suffice to say that, while Marc Schneiders has attributed this codex to a mid-eastern Irish *scriptorium*,⁹¹ in view of the numerous close parallels between *K* and Carolingian computistical manuscripts I am rather inclined to agree with Bernhard Bischoff, who thought that *K* was written on the Continent.⁹² More specifically, *K* may have been produced somewhere in

⁹⁰ The standard edition of the Old Irish glosses of *K* is still Whitley Stokes and John Strachan (eds), *Thesaurus Palaeohibernicus: A Collection of Old Irish Glosses, Scholia, Prose and Verse*, 2 vols (Cambridge, 1901–1903 [reprint: Dublin, 1975]), vol. 2, 10–30. For a useful bibliography, see Dagmar Bronner, *Verzeichnis altirischer Quellen* (Marburg, 2013), 19–20.

⁹¹ Marc Schneiders, ‘The Irish Calendar in the Karlsruhe Bede (Karlsruhe, Badische Landesbibliothek, Cod. Aug. CLXVII, ff. 16v–17v)’, *Archiv für Liturgiewissenschaft* 31 (1989), 33–78: 34–6.

⁹² Bernhard Bischoff, ‘Irische Schreiber im Karolingerreich’, in id., *Mittelalterliche Studien: ausgewählte Aufsätze zur Schriftkunde und Literaturgeschichte*, 3 vols (Stuttgart, 1966–81), vol. 3, 39–54: 48 (cf. also Bischoff, *Katalog*, vol. 1, 351 (§1676); Borst, *Schriften*, vol. 1, 234: ‘geschrieben [...] in der Gegend von Soissons und Laon’). Manuscript *K* shares many glosses

northern or north-eastern Francia, as is suggested by the mention of several saints linked with the area of Soissons in the calendar of fols 16v–17v.⁹³ One of the most remarkable features of this calendar is, of course, that it also contains the names of numerous Irish saints. As has been shown by Schneiders, the large majority of these names are linked to the mid-eastern region of Ireland. However, a few entries are related to Iona: Columba and Baithéne are mentioned together in the entry for 9 June (*Columbae ⁊ Baitheni*, fol. 17r), and the name of ‘Adomnán the wise’ is cited in the entry for 23 September (*Adomnani sapientis*,

(both Latin and vernacular) not only with the famous Vienna fragment of Bede’s *De temporum ratione* in Irish script (Vienna, Österreichische Nationalbibliothek, Cod. 15298; cf. Bronner, *Verzeichnis*, 54), but also with Angers, Bibliothèque Municipale, 477, a Breton manuscript from c. AD 900 exhibiting strong links with north-eastern Francia (cf. Dominique Barbet-Massin, ‘Le manuscrit 477 (461) d’Angers: étude codicologique et textuelle’, *Britannia Monastica* 19 (2017), 15–43; for a detailed study of the parallel glosses in these three manuscripts, see Pierre-Yves Lambert, ‘Les commentaires celtiques à Bède le Vénérable’, *Études Celtiques* 20 (1983), 119–43 and *Études Celtiques* 21 (1984), 185–206; see also, more recently, Bernhard Bauer, ‘New and corrected MS readings of the Old Irish glosses in the Vienna Bede’, *Ériu* 67 (2017), 29–48). *K* also shares a relatively rare computistical table with a group of Carolingian manuscripts, most of which present insular affiliations (cf. Pierre-Yves Lambert and Jacopo Bisagni, ‘Notes sur quelques mots vieux-bretons du manuscrit Angers 477, f° 36r°’, *Études Celtiques* 44 (2018), 155–62; to the copies of the table in question listed in this article we should now add Dijon, Bibliothèque Municipale, 448, fol. 84r (with the heading *Ordine septeno ciclus distinguitur iste*) and Einsiedeln, Stiftsbibliothek, 321 (647)—the manuscript that also contains *CE*—pp. 26 and 53). Finally, *K* shares computistical texts, tables and glosses with St Gall, Stiftsbibliothek, 248 (c. AD 850, Laon; sections of this manuscript were possibly copied directly from *K* or from a common exemplar underlying both manuscripts, as discussed in Aaron J. Kleist’s description of St Gall 248, available on-line at <<https://www.e-codices.unifr.ch/de/description/csg/0248/>>) and St Gall, Stiftsbibliothek, 251 (s. IX, St Gall). It seems reasonable to think that *K* was copied (at least partially) in a north-eastern Frankish *scriptorium* from an exemplar possibly written in Ireland; after all, as was pointed out by Whitley Stokes and John Strachan, ‘that the Irish glosses have been copied, in part at least, from an older manuscript is evident from their coincidence in part with the glosses in the Vienna Bede’ (Stokes and Strachan, *Thesaurus*, vol. 2, p. xi; cf. also Paul Meyvaert’s carefully worded statement ‘We can conclude that either Aug. CLXVII, or its exemplar, had come from elsewhere, namely from Ireland’, in ‘Discovering the calendar (*annalis libellus*) attached to Bede’s own copy of *De temporum ratione*’, *Analecta Bollandiana* 120 (2002), 5–64: 41, my italics).

⁹³ Cf. Schneiders, ‘The Irish Calendar’, 36. Schneiders states that ‘in the calendar there are some entries which were added on the continent, by (one of) the original scribe(s), who must have accompanied his books’; this explanation, however, seems rather *ad hoc*.

fol. 17v).⁹⁴ Yet, this is not the only mention of Adomnán in *K*: his name also occurs in two glosses to Bede's *DTR* (see FIGURES 1 and 2).⁹⁵

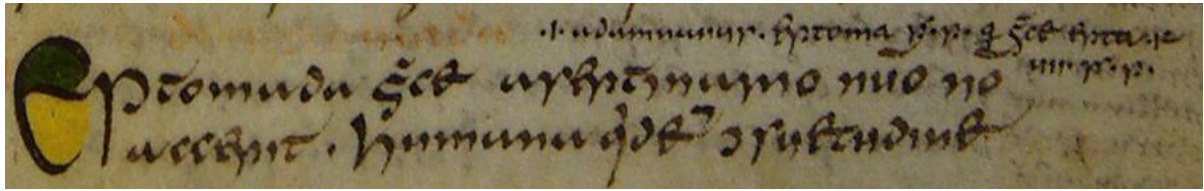


FIGURE 1. Karlsruhe, Badische Landesbibliothek, Cod. Aug. perg. 167, fol. 27rb (detail).

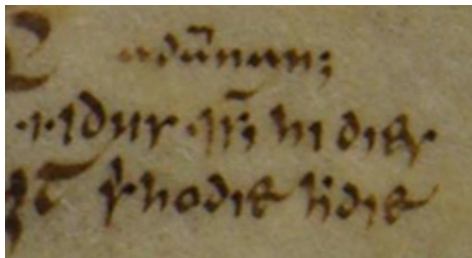


FIGURE 2. Karlsruhe, Badische Landesbibliothek, Cod. Aug. perg. 167, fol. 30rb (detail of the outer margin).

⁹⁴ It is worth noting that the adjective *sapiens* was also used by Bede in his description of Adomnán in *Historia Ecclesiastica* V, xv, 1: *erat enim uir bonus et sapiens et scientia scripturarum nobilissime instructus*. In the Early Middle Ages, Adomnán would of course have been known to continental scribes and scholars especially as the author of *De locis sanctis* (a work which enjoyed wide circulation throughout Europe), and, to a lesser extent, of the *Vita Sancti Columbae* (for the role played by this text in the context of the diffusion of the cult of Saint Columba in continental Europe, see Jean-Michel Picard, 'Adomnán's *Vita Columbae* and the cult of Colum Cille in Continental Europe', *PRIA* 98 C (1998), 1–23). That Adomnán was seen as an authoritative scholar in fields other than exegesis and hagiography may be shown by the well-known (although far from certain) mention of his name in a collection of Virgilian glosses, the *Explanatio in Bucolica Vergilii* of Iunius Filargirius (or Philargyrius) (cf. Pierre-Yves Lambert, 'Les gloses celtiques aux commentaires de Virgile', *Études Celtiques* 23 (1986), 81–128: 88–90; Brent Miles, *Heroic Saga and Classical Epic in Medieval Ireland* (Cambridge, 2011), 28–9). For the occurrence of the name of Adomnán on an early medieval relic label, see Julia M. H. Smith, *Relics and the Insular World, c. 600–c. 800*, Kathleen Hughes Memorial Lectures, 15 (Cambridge, 2017), 13, 32.

⁹⁵ There seems to be no good reason to doubt that this *Adamnanus* is indeed the famous Adomnán of Iona, especially given that the name Adomnán is exceedingly rare: to my knowledge, only two further individuals bearing this name are mentioned in the Annals of Ulster, namely *Adomnanus episcopus Ratho Maighe Oinaigh*, 'Adomnán bishop of Ráith Maige Aenaig', and *Adomhnan m. Alddailedh*, 'Adamnán son of Alddail' (cf. Seán Mac Airt and Gearóid Mac Niocaill (eds and trans.), *The Annals of Ulster (to A.D. 1131)* (Dublin, 1983 [reprint Dublin, 2004]), 184–5 (§731.8), 294–5 (§836.9)).

The two glosses read as follows:

(1) *.i. Adamnanus . eptoma per p quia graece epta id est uii per p* (fol. 27rb; this is an interlinear gloss to the opening of *DTR* 8: *Eptomada graece a septenario numero nomen accepit*).

(2) *Adamnanus / .i. idus . Isidorus hi dies sicut hodie hoc die* (fol. 30rb; this is a marginal gloss to the calendrical term *idus*, ‘ides’, occurring in *DTR* 13).⁹⁶

I shall begin my analysis with the second gloss. This is how I understand its very concise formulation:

‘Adomnán [teaches what follows]: Isidore [says that] *idus* [derives from] *hi dies* (‘these days’) just like *hodie* (‘today’) [derives from] *hoc die* (‘on this day’).’

This gloss plainly offers an etymology of the term *idus*: it relies on the rather commonplace derivation of *hodie* from *hoc die* in order to establish a parallel

⁹⁶ I came across these glosses in November 2017 while examining the digital images of *K* available on-line at <<https://digital.blb-karlsruhe.de/blbhs/content/titleinfo/20736>>. To the best of my knowledge, no publication ever refers to these glosses. In April 2019 Pádraig Ó Néill informed me that the two glosses were recorded and discussed by Steven Killion in an unpublished PhD thesis on the Irish reception of Bede’s works, submitted in 1992 to the University of North Carolina at Chapel Hill (Steven B. Killion, *Bede’s Irish Legacy: Knowledge and Use of Bede’s Works in Ireland from the Eighth through the Sixteenth Century*, pp. 166–70). Unfortunately, judging from the scans of the relevant section of Killion’s dissertation (which Prof. Ó Néill has kindly sent me), the author’s interpretation of the two glosses is faulty in many respects (for example, at pp. 167–8 the word *hi* in *hi dies* in the second gloss is wrongly understood as the Old Irish preposition *i^N*, ‘in’, rather than as the Latin demonstrative *hi* ‘these’; at p. 169, the insular abbreviation for *per*, occurring in the prepositional phrase *per p* in the first gloss, is mistakenly transcribed as *propter*); moreover, Killion’s thesis subsequently remained unpublished. So, as far as I can tell, these two mentions of Adomnán in manuscript *K* are still essentially unknown to modern scholars (it is worth noting that, although Faith Wallis does refer to Killion’s thesis in the introduction to her translation of Bede’s *DTR*, she does not mention the two glosses citing Adomnán; cf. Wallis, *The Reckoning of Time*, LXXXVII, XCIII).

etymology of *idus* from *hi dies*.⁹⁷ The mention of Isidore's name is particularly interesting, since he never actually proposed this etymology; instead, the contents of this gloss represent a conflation of two distinct Isidorian passages. In the *Etymologiae*, Isidore says:

Idus autem plerique Latinorum ab edendo dictum putant, quod hi dies apud ueteres epularum essent.

'Most Latin speakers think the ides were so named after "eating", because among the ancients those were days (*hi dies*) for feasting.'⁹⁸

Although the collocation *hi dies* does occur in this passage, Isidore clearly does *not* claim that *idus* comes from the Latin word for 'day'. However, this is precisely what he had previously maintained in his *De natura rerum*, where we read *Idus [...] dictas a diebus*, 'the ides [...] took their name from "days" [*dies*].'⁹⁹ According to the author of the gloss preserved in *K*, this conflation of the two passages in question was Adomnán's work. To my knowledge, the only text where a similar etymology is proposed is the section of *CE* entitled *De*

⁹⁷ The etymology *hodie* < *hoc die* can be found in Isidore, *Etymologiae*, V, xxx, 18: *Hodie quasi hoc die*, 'Today (*hodie*) is as if it were "on this day" (*hoc die*)' (ed. Yarza Urquiola and Andrés Santos, *Etimologías, Libro V*, p. 99; trans. Barney *et al.*, *The Etymologies*, p. 126). Like many Isidorian etymologies, this derivation also circulated independently of Isidore's text; for example, we find it in a collection of definitions and etymologies of computistical, cosmological and medical terms, headed *Incipiunt quedam alia de ratione compoti*, in London, British Library, Sloane 263, fols 14r–v (the citation *hodie quasi hoc die* is at fol. 14v, line 9); cf. also Vienna, Österreichische Nationalbibliothek, Cod. 458 (s. IX, Salzburg), fol. 46v: *Cur dicitur hodie? Hodie, quasi hoc die*. As far as Irish *computistica* are concerned, this etymology occurs in *DRC* 22: *Dies est incertum nomen inter masculinum et femininum. Ideo nomen masculinum, quia inuenitur 'festi dies', et indubio 'hodie', quasi hoc die* (ed. Ó Cróinín, 'De ratione computandi', 130, with slightly modified punctuation).

⁹⁸ Isidore, *Etymologiae*, V, xxxiii, 13 (ed. Yarza Urquiola and Andrés Santos, *Etimologías, Libro V*, p. 113; trans. Barney *et al.*, *The Etymologies*, p. 128). Isidore's derivation of *idus* from *edendo*, containing the collocation *hi dies*, can also be found in the *DDT auctus* of Laon 422, at fol. 49v (*Idus ab edendo dicti quia hi dies apud ueteres epularum erant uel idus dicitur dies qui diuidit mensem*).

⁹⁹ Isidore, *De natura rerum*, IV, 6 (ed. Fontaine, *Traité de la nature*, 189; trans. Kendall & Wallis, *On the Nature of Things*, 119).

nominationibus mensium. At page 96 of the manuscript Einsiedeln 321 we read the following extraordinary explanation (my transcription and translation):

Idus a diebus corrupte dies idus dicitur mutata .i. ante .d. et .u. pro .e. adsumpta.

‘*Idus* is a corruption of *dies* (‘days’). *Dies* can be pronounced *idus* by placing the *i* before the *d* and by substituting *u* for *e*.’

It is very tempting to recognise in this passage a practical application of some of the techniques of *scinderatio fonorum* and *permutatio litterarum* described in the *Epitomae* of Virgilius Maro Grammaticus.¹⁰⁰ In any case, it is highly significant that the author of the gloss surviving in *K* attributed this etymology to a specifically *Irish* reading of Isidore’s works—one which, in his opinion, originated from the teachings of Adomnán.

The textual ramifications associated with the other gloss of *K*—the one concerning the term *eptomada*, ‘week’—are more extensive and more complex. First of all, this is my understanding of the meaning of this gloss:

‘i.e. Adomnán [teaches what follows]: *eptoma* [is to be written] with a *p*, because in Greek *epta*, i.e. seven, [is written] with a *p*.’

In this case, the closest parallel is offered by a gloss found in the manuscript Angers, Bibliothèque Municipale, 477, a copy of Bede’s scientific works (and other computistical materials) written around AD 900 and especially famous for

¹⁰⁰ Cf. e.g. *Epitomae*, X, 76–9 (ed. Bengt Löfstedt, *Virgilius Maro Grammaticus: Opera omnia* (Munich and Leipzig, 2003), 217; my translation): *Consuerunt etiam nomina uel pronomina aliis litteris longe alio quam debuit legere modo, ut bonum quod esset bonum et ago pro ego, quae in multis inuenimus libris* (‘They [*scil.* the rhetors] also used to read nouns and pronouns with different letters, in a manner differing greatly from the norm, such as *bonum* for what should in fact be *bonum*, and *ago* instead of *ego*, which we find in many books’). Other examples of this kind of *scinderatio* include *germen* for *regmen* (X, 85), *si* for *is* (X, 87), *nodo* for *dono* (X, 89), *gelo* for *lego* (X, 90), *rihe* for *heri* (X, 91), etc.

containing the largest corpus of Old Breton glosses ever discovered.¹⁰¹ Angers 477 shares numerous glosses with both *K* and the glossed Irish fragment of *DTR* usually known as Vienna Bede (cf. fn. 92 above). In the top margin of fol. 50v of Angers 477 we find an elaborate gloss concerning the word for ‘week’ that opens *DTR* 8 (see FIGURE 3):

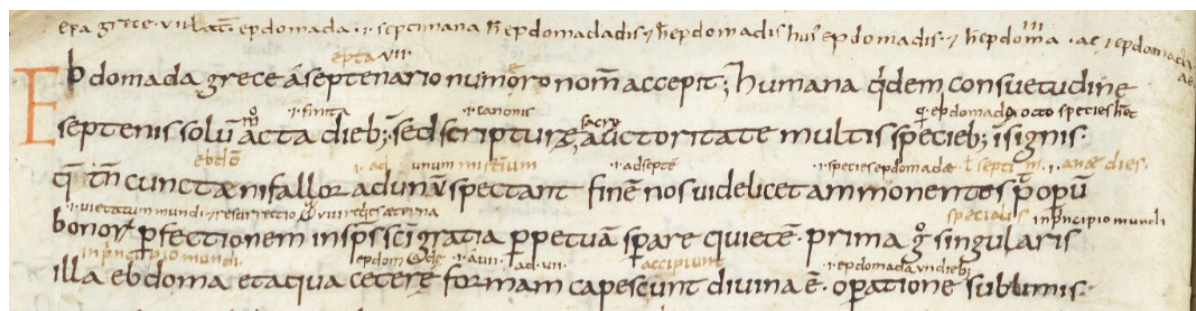


FIGURE 3. Angers, Bibliothèque Municipale, ms. 477, fol. 50v (detail) / © Angers, bibliothèque municipale, commulysse.angers.fr; IRHT-CNRS, base BVMM.

Epa grece .vii. latine · epdomada .i. septimana. haec epdomada dis 7 haec epdomadis huius epdomadis 7 haec epdoma ae 7 epdomada ae.

At first sight, this may seem rather confusing. However, the meaning of the gloss shall become clearer by applying to it a certain amount of textual editing:

Ep<t>a grece, septem latine · epdomada .i. septimana. [1] haec epdomada -dis 7 [2] haec epdomadis huius epdomadis 7 [3] haec epdoma -ae 7 [4] epdomada -ae.

The gloss can then be interpreted as follows:

‘[The word for ‘seven’ is] *ep̃ta* in Greek, *septem* in Latin: [therefore,] *ep̃doma* means *septimana* (‘week’). [The first form of this word is inflected so:] “this *ep̃doma*” [nom. sg.], “of [this] *ep̃domadis*” [gen. sg.]; [the second form is] “this *ep̃domadis*”, “of this

¹⁰¹ For an accurate description of this manuscript, cf. Barbet-Massin ‘Le manuscrit 477 (461) d’Angers’. A digital facsimile is available on the website *Bibliothèque Virtuelle des Manuscrits Médiévaux*, created and maintained by the *Institut de Recherche et d’Histoire des Textes*, Paris (the URL is <<https://bvmm.irht.cnrs.fr/>>).

epdomadis”; [the third form is] “this *epdoma*”, “of [this] *epdomae*”; [and the fourth form is] “[this] *epdomada*”, “of [this] *epdomadae*”.’

While the Adomnán gloss in *K* insists on the ‘correct’ *orthography* of the word for ‘week’, the gloss of Angers 477 elaborates instead on its *morphology*. Indeed, what we have here is a striking list of four morphological variants of the term in question: one inflected according to the third declension (nom. sg. *epdomada*, gen. sg. *epdomadis*), one presumably indeclinable (*epdomadis*, *epdomadis*), and two in the first declension (*epdoma*, *epdomae* and *epdomada*, *epdomadae*).¹⁰² The source behind this curious gloss can be identified: in all likelihood, we have here a direct citation from *CE*, which offers a nearly identical list (to be found at p. 92 of the manuscript Einsiedeln 321; see FIGURE 4, followed by my transcription and translation of the relevant passage):

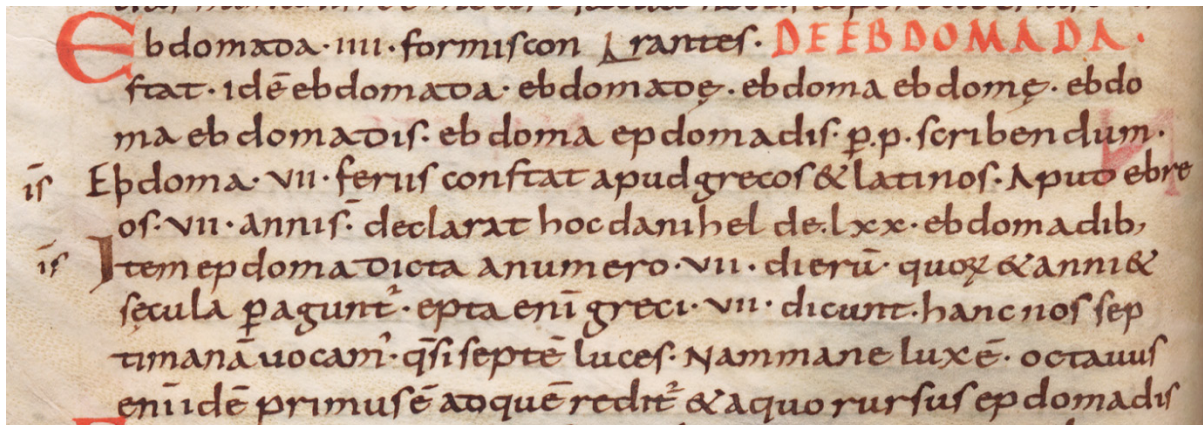


FIGURE 4. Einsiedeln, Stiftsbibliothek 321 (647), p. 92 (detail).

¹⁰² It should also be noted that *K* and Angers 477 share a rare reading of the main Bedan text: at the beginning of *DTR* 8, both manuscripts spell the word for ‘week’ with a *p* (*Eptomada* in *K*, *Epdomada* in Angers 477 *ante correctionem*), in agreement with the orthographical recommendation of the Adomnán gloss in *K*, although in Angers 477 a corrector (or possibly the main scribe?) subsequently tried to change the *p* of *Epdomada* into a *b* (a similar correction can also be seen in the interlinear gloss to *speciebus* in the second line of fol. 50v in Angers 477, where the corrector added an ascender to try and change *epdomada* into *ebdomada*; cf. FIGURE 3).

Ebdomada .iiii. formis constat, id est ebdomada ebdomadę, ebdoma ebdomeę, ebdoma ebdomadis, ebdoma epdomadis, per p scribendum.

‘[The word] *ebdomada* consists in four forms, i.e. *ebdomada ebdomadę, ebdoma ebdomeę, ebdoma ebdomadis, ebdoma epdomadis*;¹⁰³ [this word] is to be written with a *p*.’

This passage offers a perfect combination of the contents of the ‘morphological gloss’ of Angers 477 and the ‘orthographic gloss’ of *K*, since it contains *both* the series of four by-forms of ‘week’ *and* the injunction to write this word ‘with a *p*’—an injunction which is indeed followed by the scribe in most of the subsequent occurrences of this word (*epdoma, epdomadis* etc.).¹⁰⁴

At this point, the chain of connections linking *K*, Angers 477 and *CE* is unmistakable.¹⁰⁵ But there is more. First of all, the discussion of different forms and inflections of a single noun is not unprecedented: in the *Epistolae* of Virgilius Maro Grammaticus we find an analogous ‘fourfold nominative’ *uesper, uespere, uesperum, uespera*, expressing different nuances of darkness, dusk and twilight.¹⁰⁶ This parallel can be added to the above-mentioned

¹⁰³ Since the last two pairs in the list share the exact same inflection, it is likely that one of the two is a scribal error for *epdomadis epdomadis*, i.e. the indeclinable form of the noun listed in the gloss of Angers 477. That there may have been a certain degree of confusion among the early medieval *literati* in relation to the inflection of this term is shown by the distinction between *two* (rather than four) morphological variants of this term to be found in a marginal gloss to *DTR* 8 in London, British Library, Royal 15 B XIX (s. X, northern Francia), fol. 52v: *ebda septem, inde ebdoma ebdomadis uel ebdomada ebdomadę*.

¹⁰⁴ It is worth noting that a correction very similar to the ones found in Angers 477 (cf. fn. 102 above) is visible at the beginning of the fourth line of the chapter *De ebdomada* in *CE*: the scribe attempted to change *epdoma* into *ebdoma* by adding an ascender on top of the *p* (cf. FIGURE 4).

¹⁰⁵ It is important to stress that citations from both *MC* and *DRC* have been identified by Immo Warntjes in the glosses of Angers 477 (Warntjes, *Munich Computus*, CIII, CV–CVI (esp. fn. 307), CXXVI–CXXXII, CLXXXIII–CLXXXVII, CCIX). My identification of a close parallel between these glosses and *CE* now closes the circle: the author of the glosses preserved in this Breton manuscript may have had access to the *three* Irish computistical textbooks that have been discovered so far. A detailed study of all the glosses of Angers 477 (and not only the vernacular ones), comparing them with both Irish and Frankish *computistica*, is a pressing *desideratum*.

¹⁰⁶ Virgilius Maro Grammaticus, *Epistola* I, 93–4 (ed. Löfstedt, *Opera*, 11; my translation): *Est etiam uesper uespere uesperum uespera. Hic casus nominatiuus quadruplex est* (‘There is

etymology of *idus* from *dies* as a further indication that the author of *CE* may well have been familiar with the writings of Virgilius Maro Grammaticus.¹⁰⁷

Next, it is most interesting to observe that a discussion of the orthography of *(h)ebdoma*, very similar to the gloss of *K* mentioning Adomnán, occurs in another Irish text: in the chapter *De ebdomada* of *DDT auctus* 1, the fact that

also *uesper*, *uespere*, *uesperum*, *uespera*. This nominative case is four-fold'). The text proceeds then to explain the meaning of each form: for example, *uesper* is a neuter form designating the darkness produced when clouds cover the sun or when the moon takes an iron-red colour (*quotiescumque ... luna ferruginibus ... obtegatur*; possibly a reference to the phenomenon we now call 'Rayleigh scattering?'), *uespere* is an indeclinable form designating the light that fades when the sun begins its descent, etc. This passage enjoyed a fairly wide circulation as an *excerptum* (cf. Ó Cróinín, '*De ratione computandi*', 133, fn. 16); however, while the association with Virgilius Maro Grammaticus is retained in the citation of this passage in *DRC* (chapter 25), the indication of the source is usually completely lost in other texts (several of which have a Breton manuscript transmission); the *uesper* excerpt can be found, e.g., in the *Catechesis Celtica* (cf. Martin McNamara, '*The Irish affiliations of the Catechesis Celtica*', *Celtica* 21 (1990), 291–334: 318–19, 321), as well as in the following manuscripts: Dijon, Bibliothèque Municipale, 448, fol. 186v; London, British Library, Sloane 263, fols 18v–19r (in *DDT auctus* 3); Montpellier, Bibliothèque Universitaire de Médecine, H 306, fol. 35v (explicitly attributed to *Virgilius*); Paris, Lat. 6400B, fol. 260v (cf. Bisagni, '*A new citation*', 117); Paris, BNF, Lat. 7418A, fol. 25v; Rome, BAV, Pal.lat.834, fol. 42r; Rome, BAV, Reg.lat.339, fol. 52v; Valenciennes, Bibliothèque Municipale, 174, fol. 51v (amidst glosses to *DTR*, in the outer margin).

¹⁰⁷ The works of Virgilius Maro Grammaticus were certainly known to the author of *DRC*, who cited from them, correctly attributing two citations to *Virgilius* (*DRC* 25, 43; citations from Virgilius's works also occur, but without any explicit attribution, in *DRC* 1, 22, 42; cf. the previous footnote and Ó Cróinín, '*The date, provenance and earliest use*'). Another clear use of Virgilius's works in computistical texts is the etymology of *tempus* occurring in the almost certainly Irish *Dial. Langob.* II.A (Borst, *Schriften*, vol. 1, 433) and in the *DDT auctus* of Laon 422, where we read what follows (fols 49v–50r, here with added punctuation and minimal editing; my translation): *tempus nomen compositum est in latinum phylosophorum est* [either the first or the second *est* must be expunged], *id est temps et pus: tempus* [corrected to *temps*] *enim eius uel aetas, pus custodia inde est tempus* '*eui uel aetatis custodia*', *id est quia custodit sex aetates mundi* ('*tempus* is a compound noun in the Latin of the philosophers, i.e. [it is a compound of] *temps* and *pus*: indeed, *temps* means 'time' or 'age', [and] *pus* [means] 'custody', so that *tempus* means 'custody of time' or 'custody of the age', and this because [time] guards the six ages of the world'; a practically identical copy of the same passage can be found in Cologne, Dombibliothek, 83-II, fol. 23v). This etymology of *tempus* is based on Virgilius Maro Grammaticus, *Epitomae*, XI, ll. 82–3 (ed. Löfstedt, *Opera*, 230): *Pus in latinitate philosophica custodia dicitur* (notice the close match with the *latinum phylosophorum* of Laon 422; for a detailed discussion of *pus* = *custodia* see Anne Grondeux and Colette Jeudy, '*À propos de pus: sens médiéval d'un mot antique*', *Archivum Latinitatis Medii Aevi* 59 (2001), 139–60).

‘the Greeks write this word with a *p*’ is not only stated¹⁰⁸ but also put into practice, as can be seen from the repeated occurrence of the spelling *epdoma* in this text (two examples in the last two lines of fol. 44r; numerous further examples at fols 44v–45r). Significantly, the rare spelling *eptoma* can be found in yet another *DDT auctus*: the one I have labelled *DDT auctus 3*.¹⁰⁹

All this evidence shows that the orthographical and etymological observations about *idus* and *(h)ebdoma(da)*, attributed to Adomnán in the two glosses of *K*, are highly characteristic of Irish and Irish-influenced *computistica*. It is important to stress that, to my knowledge, the contents of these glosses have no parallels in any late antique or early medieval tracts on grammar or orthography: the *only* parallels identified so far occur in Hiberno-Latin tracts concerning the divisions of time, where interest in linguistic and especially etymological matters is usually very strong and pervasive.¹¹⁰

¹⁰⁸ The relevant passage of Laon 422, fol. 44r, reads as follows (with added punctuation and minimal editing; my translation): *In primis sciendum quomodo hoc nomen scribitur: cum Grecis per P, hoc nomen compositum est, id est ebdoma* [the words from *hoc nomen* to *ebdoma* were probably copied due to a mistake of anticipation: they do not make much sense here and they are repeated in the next sentence]; *cum Latinis per B, et hoc nomen compositum est, id est ebda quod septem interpretatur, ut Isidorus dicit ‘septimanam dicimus quasi septem lucis, mane enim lux est’* (‘First of all we must know how this noun [i.e. ‘week’] is written: the Greeks write it with a *p*; the Latins write it with a *b*, and this is a compound noun, i.e. *ebda*, which means ‘seven’, as Isidore says ‘we call this a *septimana*, as if it were “seven lights”, for the morning (*mane*) is light’ [a citation from Isidore, *Etymologiae*, V, XXXII; ed. Yarza Urquiola and Andrés Santos, *Etimologías, Libro V*, p. 105–7; trans. Barney *et al.*, *The Etymologies*, p. 127]).

¹⁰⁹ London, British Library, Sloane 263, fol. 19r (my translation): *Ebdomada dicta est a greca appellatione, quasi eptoma a numero vii dierum; epta enim apud Grecos vii mades dies ueteres dicebant* (‘[The word] *ebdomada* derives from Greek, as if it were *eptoma*, from the number of its seven days; indeed, *epta* in Greek means ‘seven’, [and] the ancients used to say *mades* for ‘days’). The same passage can be found in Madrid, Biblioteca Nacional, 9605, fol. 99rb; Paris, BNF, Lat. 528, fol. 75r; Paris, BNF, Lat. 2183, fol. 121v; in these three copies, however, the original reading *eptoma* (which is clearly the *lectio difficilior*) has been banalised to *ebtoma*.

¹¹⁰ An apparently later development of the orthographical variation between *(h)ebdoma(da)* (with *b*) and *(h)epdoma(da)* (with *p*) can be found in the glosses to *DTR* famously attributed to *Bridfertus* (Byrhtferth of Ramsey?) by Herwagen, which were reprinted beneath the edition of *DTR* in *PL* 90 (for the *uexata quaestio* surrounding the origin of the so-called ‘Byrhtferth glosses’ see especially Michael Lapidge, ‘Byrhtferth of Ramsey and the *Glossae Bridferti in Bedam*’, *The Journal of Medieval Latin* 17 (2007), 384–400, and John Contreni, ‘Old orthodoxies die hard: Herwagen’s *Bridferti Rameniensis Glossae*’, *Peritia* 22–23 (2011–12),

But what are we to make of these attributions to Adomnán? I can see at least three alternative explanations for them. The author of the two glosses may have taken their contents from: (1) a lost computistical work truly composed by Adomnán, possibly similar to the *Computus Einsidlensis*; (2) an Irish computistical textbook or an Irish tract on the divisions of time that came to be falsely attributed to Adomnán in the course of its manuscript transmission; (3) an Irish text that the glossator himself ascribed to Adomnán.

Unfortunately, unless further evidence emerges, none of these hypotheses can be independently verified. In view of the major role that Adomnán appears to have played (especially according to Bede) in spreading the Dionysiac reckoning to Ireland at the end of the seventh century, it is actually not inconceivable that he might have composed a computistical tract;¹¹¹ however, for the moment this

15–52). At the beginning of the long gloss to *DTR* 8 the *glossae Bridferti* state what follows (*PL* 90, col. 326C; my translation): *Inter hebdomadam per b, et hepdomadam per p, hoc distat, quod hebdo est concipio, unde hebdomadae dicuntur conceptiones; hepdā vero, per p, dicuntur septem. Unde hepdomada dicitur septimana* ('This is the difference between *hebdomada* with *b* and *hepdomada* with *p*: *hebdo* means 'I conceive' (*concupio*), so that opinions (*conceptiones*) are called *hebdomadae*; instead, *hepdā* with *p* means 'seven', and for this reason the week is called *hepdomada*'). The same text can be found among the abundant glosses to *DTR* in Valenciennes, Bibliothèque Municipale, 174, fol. 46r (inf. marg.), where there are also numerous occurrences of the spelling of 'week' with *p*. Moreover, very similar materials resurface in Carolingian glosses and commentaries to Boethius's *De Hebdomadibus* that have sometimes been associated with John Scottus Eriugena, although they may in fact stem from the teachings of Remigius of Auxerre: cf. e.g. Paris, BNF, Lat. 12957, fol. 12r, and Paris, BNF, Lat. 14088, fol. 116r (*ebtimema* [sic, for *entimema*] *conceptio, ebtimemata conceptiones; ebdo per b concipio, per p epdomamada* [sic, for *epdomada*] *significat tempus*; cf. E. K. Rand (ed.), 'Der Kommentar des Johannes Scottus zu den *Opuscula sacra* des Boethius', in id., *Johannes Scottus* (Munich, 1906), esp. p. 50; Dermot Moran, *The Philosophy of John Scottus Eriugena: a Study of Idealism in the Middle Ages* (Cambridge, 1989), 45–6; John Marenbon, *Boethius*, Great Medieval Thinkers Series (Oxford, 2003), 170–1, 214). The relationship between the gloss of *K* and these later textual materials is unclear, although it does seem reasonable to surmise that the *differentia* between *hebdomadae* = *conceptiones* and *hepdomadae* = *septimanae* may have originated from the meeting of two traditions: Irish glosses commenting on the term for 'week' in Bede's *DTR* 8 and Carolingian glosses attempting to elucidate the (misleading) title of Boethius's tract *De Hebdomadibus*.

¹¹¹ Bede, *Historia Ecclesiastica*, V, XV and XXI. For a discussion of Adomnán's role in the Easter controversy, see Clare Stancliffe, '“Charity with peace”: Adomnán and the Easter question', in J. Wooding, R. Aist, T. O. Clancy and T. O'Loughlin (eds), *Adomnán of Iona: Theologian, Lawmaker, Peacemaker* (Dublin, 2010), 51–68. Cf. also Warntjes, *Munich Computus*, LXXXVIII, CLVII–CLVIII.

must remain speculative. Yet, even regardless of the factual accuracy of these mentions of Adomnán, it is fascinating to observe that a mid-ninth-century Irish scholar, probably a *peregrinus* working in a Frankish *scriptorium*, was still able to attribute two pieces of information related to computistical terminology to an Irish canonical authority.¹¹² These two glosses are small but important indications that some aspects of the Hiberno-Latin computistical tradition may have occasionally remained *recognisably Irish* even during the Carolingian age—at least within textual communities strongly influenced by Irish written culture. These appeals to the *auctoritas* carried by Adomnán’s name are perhaps not too distant from the striking sense of ethnic self-awareness displayed by the Irish *peregrinus* Dicuil, who, in his complex treatise *De astronomia* (written between 814 and 818), referred explicitly to the computistical tradition preserved by *mea gens in Hibernia*, ‘my people in Ireland’.¹¹³

7. LATER VERNACULAR IRISH TEXTS DEALING WITH THE DIVISIONS OF TIME

In view of the remarkable continuity displayed by the Irish computistical tradition between the eighth and the ninth centuries, one may legitimately wonder whether the system of the divisions of time presented in texts such as *CE*, *MC*, *DDT* and *DRC* also had an influence on vernacular Irish literature. To my knowledge, this topic has never been investigated systematically,¹¹⁴ and for

¹¹² If on the contrary *K* was written in Ireland, it is still significant that the glosses mentioning Adomnán would have been available to the Carolingian *literati* who had access to this manuscript when it reached the Continent (although admittedly it is equally significant that, as far as we can tell, no continental scribe appears to have retained and copied those attributions!).

¹¹³ More precisely, Dicuil (*Liber de astronomia*, I, v, 2) refers to the rule for the application of the *saltus lunae* according to the Greeks and the Latins, *quam mea gens in Hibernia [...] semper custodit* (‘which my people in Ireland [...] always keeps’; ed. Esposito, ‘An unpublished astronomical treatise’, 388; my translation; cf. fn. 18 above).

¹¹⁴ In 2010 Dáibhí Ó Cróinín published an article on the continuity of Irish computistics in the eleventh and twelfth centuries, and his discussion focusses especially on the vernacular text

this reason it exceeds the limits of the present contribution. A few hints may nonetheless be provided.

A certain consistency can be detected in the translation of Latin terms designating the divisions of time in the Old Irish glosses: thus, for instance, Lat. *momentum* is usually translated by means of OIr. *brothad* ('moment, short space of time').¹¹⁵ The vernacular glosses of *K* also provide some evidence for the development of an Old Irish terminology of the divisions of time, although in this case the units in question are admittedly closer to Bede's system than to the Irish one.¹¹⁶

Direct connections between the Hiberno-Latin computistical tracts and vernacular Irish texts appear to be extremely rare. A possible exception is the long entry about *Deach* ('syllable') in *Sanas Cormaic* (c. AD 900), where the following Latin citation occurs: *unus non est numerus sed ab eo crescunt numeri* ('one is not a number, but numbers grow from it').¹¹⁷ However, while it is true that this sentence occurs in both the *Standard DDT* (at fol. 63vb of the Sirmond manuscript, where it is introduced by the vague phrase *alius dicit*; cf. Appendix I below, at I.4.7) and *DRC 7* (where it is attributed to Augustine),¹¹⁸ Hrabanus Maurus too cited this statement (probably from *DDT*) in his textbook *De*

Sex Aetates Mundi (Dáibhí Ó Cróinín, 'The continuity of Irish computistical tradition', in I. Warntjes and D. Ó Cróinín (eds), *Computus and its Cultural Context in the Latin West, AD 300–1200* (Turnhout, 2010), 324–47). However, none of the texts treated in this article appears to deal with the divisions of time.

¹¹⁵ Cf. e.g. Wb. 25b26 (with *brothad* = *momentis*; Stokes and Strachan, *Thesaurus*, vol. 1, 660.19); Ml. 134d2 (with *brothad* = *momentum*; Stokes and Strachan, *Thesaurus*, vol. 1, 459.27). For further relevant examples from both the Old Irish glosses and other Early Irish texts, see the *Electronic Dictionary of the Irish Language* (<<http://www.dil.ie/>>), s.v. *brathad*, *brothad*, and also *atam*, *2 úar* (a), *ungae* III.

¹¹⁶ Cf. especially the following gloss (ed. Stokes and Strachan, *Thesaurus*, vol. 2, 10.7; cf. also fn. *f* on that page): *di huáir deac 7 iii brottae 7 unga 7 atom* ('twelve hours and four moments and an ounce and an atom').

¹¹⁷ Ed. Whitley Stokes, *Three Irish Glossaries* (Edinburgh and Oxford, 1862), 16; my translation (cf. also Kuno Meyer (ed.), '*Sanas Cormaic*', *Anecdota from Irish Manuscripts*, vol. 5 (Dublin, 1913), 37).

¹¹⁸ Cf. Ó Cróinín, '*De ratione computandi*', 120, fn. 7.

computo, written in AD 820.¹¹⁹ It is therefore possible that the compiler(s) of *Sanas Cormaic* took the excerpt in question from Hrabanus's manual, which enjoyed wide circulation in Carolingian schools, rather than from the earlier (and by then somewhat outdated) Irish works.¹²⁰

After the tenth century, we find more evidence suggesting that even in Ireland the old Hiberno-Latin divisions of time were gradually superseded by the system popularised by Hrabanus.¹²¹ The clearest piece of evidence of this process is a

¹¹⁹ Hrabanus Maurus, *De computo*, I, 2.17: *Item alibi scriptum est: Unus non est numerus sed ab eo crescunt numeri* (ed. W. Stevens, *De computo*, CCCM 44 (Turnhout, 1979), 199–321). See also Irene Caiazzo (ed.), *Lectures médiévales de Macrobe: les Glosæ Colonienses super Macrobiūm* (Paris, 2002), 191–2, fn. 4.

¹²⁰ A similar problem concerns the eighth-century cosmological text *In Tenga Bithnua*. A passage of this text contains a statement according to which the world was created at midnight and will also be destroyed at midnight (ed. and trans. John Carey, *In Tenga Bithnua – The Ever-New Tongue*, Apocrypha Hiberniae II (Turnhout, 2009), 214–7, §§93–4). The same statement also occurs in *DDT*, where it is attributed to Jerome (cf. Appendix I below, at II.8.18: *Secundum Romanos autem dies naturalis incipit a media nocte usque ad mediam noctem, propter illam auctoritatem Hyeronimi qua dixit: 'Quia in media nocte factus est mundus et in media nocte iterum destruetur'*; cf. also PL 90, col. 657 B). However, it is not possible to determine whether the author of *In Tenga Bithnua* took this idea from *DDT*, given that, as has been pointed out by John Carey (in *The Ever-New Tongue: the Text in the Book of Lismore* (Turnhout, 2018), 96–7), this quotation appears (often accompanied by the pseudepigraphical attribution to Jerome) in numerous Hiberno-Latin texts, such as the *Catechesis Celtica*, MC (chapter VIII, 41–3), *DRC* (chapter 26), and the *Bobbio Computus*. For further examples and discussion, cf. Ó Cróinín, 'De ratione computandi', 134, fn. 6; Warntjes, *Munich Computus*, CXXXII; moreover, this important Irish diagnostic feature occurs also in the following (and undoubtedly many other) manuscripts: Dijon, Bibliothèque Municipale, 448, fol. 186v (amidst various computistical *excerpta*); Madrid, Biblioteca Nacional, 9605, fol. 71ra (amidst *excerpta* from *DDT*); Paris, BNF, Lat. 528, fol. 5r (in a commentary on Genesis); Paris, BNF, Lat. 2341, fol. 4vb (in a short computistical dialogue); Paris, BNF, Lat. 2796, fol. 85r (in a short tract entitled *De inicio diei*); Paris, BNF, Lat. 5239, fol. 110v (in a short tract *De materia bissexti*); Paris, BNF, Lat. 7418A, fol. 23v (amidst *excerpta* from *DDT*; here, most interestingly, both the citation and the attribution to Jerome were crossed out by a later reader or corrector); Rome, BAV, Pal.lat.1447, fol. 31r (amidst *excerpta* and short tracts related to *DDT*); Rome, BAV, Ross.247, fol. 171r (in a tract *De bissextō*).

¹²¹ For the divisions of time in Bede's *De temporibus* and *DTR*, cf. fn. 31 above. In his *De computo* (I, 10), Hrabanus lists 14 divisions of time: *Atomus, ostentum, momentum, partes, minutum, punctus, hora, quadrans, dies, mensis, uicissitudo, annus, seculum, aetas*. Hrabanus's list is a conflation of the Irish and the Bedan traditions: thus, he enumerates fourteen divisions, like the Irish *computi*, but he takes *partes* and *ostenta* from, respectively, *DTR* III, 24–5 and III, 38–39 (ed. Jones, *Opera Didascalica*, 277–8), omitting instead the week and the *mundus* (cf. Warntjes, *Munich Computus*, CXII). For a brief but useful discussion

passage contained in the Yellow Book of Lecan copy of the Middle Irish recension of *Cath Maige Rath*.¹²² Here, the inauguration of Domnall mac Áedo to the High Kingship of Ireland is dated by means of a computistical formula that specifies the hour, time, age of the moon and day of the week of the event. This unusually precise dating is followed by a brief account of how time is to be divided; here, this list of fifteen units is given, followed by details of their numerical values:

Oir is amlaid ordai\g/ter in aimser ó adam co haimser, .i. o adam i n-ostint, a h-ostint i mbratha, a bratha i pars, a pars i minuit, a minuit i pongc, a pongc i n-uair, a h-uair i cadar, a cadar i llaithi, a laithi i sechtmáin, a sechtmáin i mís, a mís i tremhsi, a tremsi i mbliadain, a bliadain i sáegul, a sáegul i n-áeis.

IS amlaid cuirther cach ana chéli d'foglachaib na h-aimsire, .i. sé h-adaim .lxx. ar tri cétaib i n-ostint, ostint co leth i mbratha, bratha 7 da trian bratha i pars, pars go leith i minuit, da minuit go leith i ponc, ceitri puinc i n-uair, .ui. h-uair i cadar, ceitri cadair i llaithi, .uii. laithi i sechtmáin, tricha laithi, nó laithi ar tricaid, in cach mí, acht ginmotha ocht<f>ightech¹²³ Fe/a\bra namá. Conad é sin eterscert na h-aimsire sein.

‘For it is so that time is ordered, from an atom to an age, i.e. from an atom to an ostent, from an ostent to a moment, from a moment to a part, from a part to a minute, from a minute to a point, from a point to an hour, from an hour to a quarter-day, from a quarter-day to a day, from a day to a week, from a week to a month, from a month to a season, from a season to a year, from a year to a *sáegul*, from a *sáegul* to an age.

And thus are the different divisions of time proportioned to each other, i.e. 376 atoms in an ostent, 1½ ostents in a moment, 1⅔ moments in a part, 1½ parts in a minute, 2½ minutes in a point, 4 points in an hour, 6 hours in a quarter-day, 4 quarter-days in a day,

of the divisions of time in Bede’s and Hrabanus’s works, as well as in later medieval texts on *computus*, see Borst, *Kalenderreform*, 568–73.

¹²² Ed. and trans. John O’Donovan, *The Banquet of Dun na n-Gedh and the Battle of Magh Rath, an Ancient Historical Tale* (Dublin, 1842), 89–321. For some brief comments on the manuscript transmission of *Cath Maige Rath*, see Carl Marstrander, ‘A new version of the Battle of Mag Rath’, *Ériu* 5 (1911), 226–47: 226.

¹²³ Possibly corrected to *ochtichtech* (for *ocht-fíchtech*, ‘twenty-eight’).

7 days in a week, 30 or 31 days in a month, except February alone, which has only 28 [days]. Such is the proper division of time.’¹²⁴

The presence of *ostint* and *pars* in this passage is a crucial diagnostic feature which leaves no doubt that this is *not* the ancient list of the eighth-century Irish tracts; instead, this account of the divisions of time is plainly based on the information provided by Hrabanus Maurus in his manual.¹²⁵

It is therefore clear that by the Middle Irish period continental computistical learning had reached Ireland, where, eventually, it supplanted completely the earlier Hiberno-Latin tradition.

8. CONCLUSIONS

The study of the Irish tradition of the divisions of time is highly instructive for the development of Irish *computus* as a whole. In particular, while modern historians have tended to focus especially on the Easter controversy, one of the most interesting phases of growth of a specifically Irish computistical literature dates in fact from the phase that *follows* the general adoption of the Dionysiac reckoning from *c.* AD 700 onwards. During the Easter controversy, scholarly efforts naturally had to concentrate on the production of apologetic and

¹²⁴ I have transcribed the text (with minimal editing and some added punctuation) from Dublin, Trinity College, 1318 (Yellow Book of Lecan), col. 283 (a digital facsimile of this manuscript is available on the *Irish Script on Screen* website, at the URL <<https://www.isos.dias.ie/>>). The signs \ / and / \ enclose, respectively, suprascript and subscript letters. The translation is adapted from O’Donovan, *The Banquet*, 109.

¹²⁵ Cf. the (outdated) discussion in O’Donovan, *The Banquet*, 331–4. The main difference between Hrabanus’s list and the one in *Cath Maige Rath* is the presence of the week (*sechtmain*) in the latter: other than that, the two lists are identical. The numerical data are likewise the same: the only difference is that Hrabanus gives a value of $2\frac{2}{3}$ *momenta* = 1 *pars* (*De computo*, I, 14: *recipiunt autem singulae partes momenta duo et duas partes unius momenti*), against the value of $1\frac{1}{3}$ *bratha* = 1 *pars* in *Cath Maige Rath*. It is therefore very likely that the text preserved in the Yellow Book of Lecan should be emended to <da> *bratha 7 da trian bratha i pars*, ‘<two> moments and two thirds of a moment in a part’.

polemical texts defending or attacking the various competing reckonings. Thus, if on the one hand, the controversy helped the Irish *literati* to acquire a high level of technical competence, on the other, this rather hostile environment had also the effect of maintaining the focus almost exclusively on the sole problem of Easter, thereby stifling the development of other areas of *computus* such as the study of the calendar as a whole, or the definition of the position of this newly established discipline within the idealised programme of the *artes liberales*—especially its relationship with cognate areas such as arithmetic and astronomy.

In my opinion, the more organic evolution of *computus* that took place in the eighth century was made possible precisely by the gradual resolution of the controversy, when the technical problem of the calculation of the date of Easter, though of course remaining central to computistical learning, also left space for the discussion of different and more theoretical issues, including, among other things, a better definition of the divisions of time, as well as of time itself.

I do not think it is a coincidence that the three Irish computistical textbooks and Bede's two manuals (*De temporibus* and *De temporum ratione*) were all composed within the first three decades of the eighth century: indeed, this is the time when the victorious supporters of the Dionysiac reckoning in both Ireland and Britain saw the need to provide ecclesiastical schools with comprehensive treatments of *computus*,¹²⁶ along the lines of what was already available for other disciplines. In this light, it is not particularly surprising that the period between c. 700 and 730 should be an 'age of textbooks'.

However, while ancient *artes* such as *grammatica* could boast a centuries-long tradition and a firm place among the divisions of knowledge sanctioned by late antique *auctoritates*, *computus* could not. The effort of elevating the scholarly standing of *computus* by integrating it, at least on a theoretical level, into the structure of the *artes liberales* is impressively illustrated by the first

¹²⁶ Cf. Warntjes, *Munich Computus*, XLIV–LI.

twelve chapters of the latest of the three Irish computistical textbooks, namely *De ratione computandi*. These chapters, as we have seen, may have been based on the slightly earlier *Sententiae in laude conpoti*, an introduction to *arithmetica* roughly constituting the first quarter of the cohesive tract that I have labelled *Standard DDT*. Through the inclusion of authoritative propaedeutic materials on number theory, in a single stroke these texts provided *computus* with a suitable patristic pedigree *and* a comfortable place within the edifice of *arithmetica*.¹²⁷

Once this process was completed, it was time for another major step forward: while the more practical side of *computus* could now be relegated to the compilation of long formularies which facilitated all kinds and manners of calendrical calculations, at the same time Irish computists working around the middle of the eighth century could dedicate themselves to the composition of advanced tracts focussing on highly specialised topics. The *Computus Hibernicus Parisinus* of AD 754 and the *DDT auctus* 1 are excellent examples of this trend: these works show that around the middle of the eighth century Irish computistical scholars expanded considerably their horizon, wielding with remarkable confidence the methods and data of disciplines such as *grammatica* and biblical exegesis.

Eventually—possibly also thanks to the intermediary role of Breton and Western Frankish *scriptoria*—some of these texts fed into the *mare magnum* of Carolingian intellectual culture, although often diluted in the context of heterogeneous encyclopaedias and collections of *excerpta*, or reduced to scholastic mnemonic aids such as the numerous *Short DDTs* that have survived.

¹²⁷ For stimulating discussions of the development of *computus* as a component of the ecclesiastical curriculum between the seventh century and the Carolingian age, see in particular Wallis, *The Reckoning of Time*, XVIII–XXXIV; John J. Contreni, ‘Counting, calendars, and cosmology: numeracy in the early Middle Ages’, in J. J. Contreni and S. Casciani (eds), *Word, Image, Number: Communication in the Middle Ages* (Florence, 2002), 43–83; Warntjes, *Munich Computus*, XXX–XXXIV (providing many further bibliographic references); id., ‘Seventh-century Ireland’, 44–60; Ivana Dobcheva, ‘The umbrella of Carolingian computus’, in M. J. Muñoz, P. Cañizares and C. Martín (eds), *La Compilación del Saber en la Edad Media* (Porto, 2013), 211–29.

Yet, even submerged by the myriad accents of Carolingian schools, a few distinctive Irish voices from decades before lingered on, and from the margins of the mid-ninth-century manuscript Karlsruhe 167 the venerable name of Adomnán of Iona still resonates, if only for a brief moment.¹²⁸

¹²⁸ The following two recent books reached me too late to be taken into account in this contribution: Leofranc Holford-Strevens, *The Disputatio Chori et Praetextati. The Roman Calendar for Beginners* (Turnhout, 2019); Máirín MacCarron, *Bede and Time. Computus, Theology and History in the Early Medieval World* (Abingdon and New York, 2019).

APPENDIX I

A semi-diplomatic edition of *De divisionibus temporum* from Oxford, Bodleian Library, Bodley 309

The text offered in the present appendix should be seen merely as an *interim* edition of the *Standard DDT* (for this definition, cf. section 4 above). While this *interim* edition does at least provide a more complete text than what was previously available in print, it does not replace a full critical edition, for the preparation of which *all* the evidence offered by the twenty-eight witnesses identified so far (plus any witnesses that may be identified in the future) should be taken into account. Only a proper critical edition will enable us to make sense of the fairly substantial level of variance among the extant copies and will perhaps make it possible to reconstruct an earlier form of the text.

This edition is *diplomatic* in the sense that, essentially, it reproduces the text of *DDT* as it is preserved in Oxford, Bodleian Library, Bodley 309 (the famous ‘Sirmond manuscript’), fols 62v–73v (*siglum S*). Although I have corrected a few obvious scribal mistakes (e.g. *qauattuor* for *quattuor*, and the like), I have not attempted to correct or standardise systematically the orthography and the grammar of *S*.

However, this edition is only *semi*-diplomatic in the sense that I have applied a certain amount of editing to the text: in particular, the layout *per cola et commata*, the capitalisation of proper names and the punctuation are editorial. Moreover, a few errors of *S* have been corrected on the basis of superior readings found in an early ninth-century copy of *DDT* which is otherwise very close to *S*, namely Geneva, Bibliothèque Publique et Universitaire, lat. 50, fols 135v–148v (*siglum G*). Moreover, significant textual variants from Basel, Universitätsbibliothek, F III 15k, fols 21r–35v (*siglum B*), which in all likelihood belongs to a different line of transmission of *DDT*, are occasionally mentioned in the notes.

Although no extensive and systematic *Quellenforschung* has been carried out, an effort has been made to identify at least all direct citations in which either the name of the author or the title of the work cited are explicitly mentioned.

Finally, a sequential subdivision of the text into numbered sections has been provided not only to facilitate future referencing, but also to represent more clearly the internal articulation of *DDT*. This is how I have subdivided the text:

I. *Sententiae in laude compoti*: I.1, introduction; I.2, origins of the rational understanding of numbers (*ratio numerorum*); I.3, the divisions of knowledge (*philosophia*); I.4, arithmetic; I.5, discussion of Roman numerals and specific numbers.

II. *De divisionibus temporum* proper: II.1, list and general discussion of the divisions of time; II.2, the *atomus* and its various kinds; II.3, the *momentum*; II.4, the *minutum*; II.5, the *punctum*; II.6, the *hora*; II.7, the *quadrans*; II.8, the day and the night, and their subdivisions; II.9, the week; II.10, the months; II.11, the year and its various kinds, also offering a discussion of several types of cycle (II.11.α–θ); II.12, the seasons (*tempora*)—a section that should have normally followed II.10 but is here misplaced; II.13, the *aetas*; II.14, the *saeculum*; II.15, the *mundus*.

Folio numbers are indicated in square brackets. The expansion of scribal abbreviations is always marked in italics, and *q̄* represents *e caudata*. The signs *//* and */* enclose, respectively, suprascript and subscript letters. Supplied letters are enclosed in angle brackets. Roman numerals are always written in small capitals. The following abbreviations have been used in the notes: *ac* = *ante correctionem*; *pc* = *post correctionem*; *in ext. / int. / sup. / inf. marg.* = *in exteriore / interiore / superiore / inferiore margine*.

For a list of primary sources cited in the notes to the edition, see the bibliography at the end of the present publication.

[I] [62v] INCIPIVNT SENTENTIE SANCTI AGUSTINI ET ISIDORI IN LAUDE COMPOTI¹

[I.1] Agustinus dixit de quattuor diuisionibus scripture: ‘Quattuor² necessaria sunt in ecclesia Dei. Canon diuinus, in quo narratur et prædicatur uita futura; Historia, in qua gesta rerum narrantur; Numerus, in quo facta futurorum et sollemnitates diuinę dinumerantur; Grammatica, in qua scientia uerborum intellegitur. Iste sunt *quattuor* diuisiones scripture, quasi quattuor fundamenta.’³ Item Isidorus in laude compoti dicit: ‘Ratio numerorum contemnenda *non est*. In multis enim *sanctarum* scripturarum locis quantum mysterium habet⁴ elucet. Non enim frustra in laudibus Dei dictum est: “omnia in mensura et in numero et in pondere fecisti.”⁵ Senarius namque, qui partibus suis perfectus est, perfectionem mundi quadam numeri sui significatione declarat. Similiter et XL dies, quibus Moyses et Helias et ipse Dominus ieiunauerunt, sine numerorum cognitione non intelliguntur. Sic et alii in scripturis sacris numeri existunt, quorum figuras nonnisi noti huius artis scientię soluere possunt. Datum est etiam nobis ex aliqua parte sub numerorum consistere disciplina, quando horas per eam discimus, quando de mensium curriculo⁶ disputamus, quando spatium anni redeuntis agnoscimus. Per numerum siquidem ne confundamur instruimur. Tolle numerum a rebus omnibus, et omnia pereunt; adime saeculo compotum, et omnia ceca ignorantia complectentur, nec differri possunt a ceteris animalibus, qui calculi nesciunt rationem.’⁷

¹ compoti *S ac*. The title is absent altogether in *G*.

² Qauattuor *S*.

³ Though not occurring *verbatim* anywhere in Augustine’s extant corpus, this passage is in all likelihood a re-elaboration of *De genesi ad litteram*, I, 1 (cf. Ó Cróinín, ‘*De ratione computandi*’, 117).

⁴ *Sic*, for *habent* (same reading in *G*).

⁵ Sap 11: 21.

⁶ *G*; curricula *S*.

⁷ Isidore, *Etymologiae*, III, IV, 1–4.

[I.2.1] *Δiscipulus*. Hec ergo ratio numerorum, unde primum processit scire nunc debemus.

Magister. A Deo scilicet, quia omnis sapientia et scientia a Domino Deo est, ex quo facta sunt omnia.

[I.2.2] *Δ*. Dic ergo: quando primum inuenta est ista ratio?

M. Ex illo tempore ex quo factę sunt creature, hoc est ab origine saeculi. Tunc enim primum numerus initiauit, sicut in Genesi legitur: ‘et factum est uespere et mane dies unus.’⁸ Tunc ergo dixit de nocte et die, quando dixit ‘uespere’, id est nox, et ‘mane’, id est dies; de numero, autem, quando dixit ‘dies unus.’ Sic dies secundus, sic tercius, sic quartus, sic quintus, sic sextus, sic septimus. Iterum de numero dixit Deus quando dixit de sole et luna: ‘et sint in signa et in tempora et in dies et in annos.’⁹ Quando dixit ‘dies’ et ‘tempora’ et ‘annos’, tunc de numero dixit. Quis enim potest intelligere dies et tempora et annos nisi per numerum? Inde dixit Boetius: ‘Omnia quecumque a primeua rerum natura constructa sunt, numerorum uidentur ratione formata. Hoc enim fuit principale exemplar in animo [63r] conditoris. Hinc enim quattuor elementorum multitudo mutata¹⁰ est, hinc temporum uices, hinc motus astrorum cęlique conuersio intelligitur.’¹¹ Item Boetius dicit: ‘Propria¹² ipsa natura numerorum omnis astrorum cursus omnisque astronomica ratio constituta est. Sic enim ortus occasus colligimus, sic tarditates uelocitatesque errantium syderum custodimus, sic defectus et multiplices lunę uariationes agnoscimus.’¹³

[I.3.1] *Δ*. Hęc igitur ars, hoc est numerus, quod nomen generale habet?

M. Philosophia scilicet, quia omnis sapientia philosophia nominatur.

[I.3.2] *Δ*. Quid est autem philosophia, et cuius linguae est?

⁸ Gn 1: 5.

⁹ Gn 1: 14.

¹⁰ Sic, for mutuata (same reading in G).

¹¹ Boethius, *De institutione arithmetica*, I, 2. Cf. *De ratione computandi*, 12.2–3.

¹² Sic, for proprie (same reading in G).

¹³ Boethius, *De institutione arithmetica*, I, 1. Cf. *De ratione computandi*, 12.5–8.

M. *Grecum nomen est, et interpretatur amor scientiæ. Philó enim apud Grecos amor dicitur latine; sophia uero sapientia uel scientia interpretatur.*

[I.3.3] A. *Philosophia quomodo diffinitur?*

M. *Isidorus diffiniuit dicens: ‘Philosophia est rerum humanarum diuinarumque cognitio.’¹⁴ In hoc exemplo ostenditur, quod omnis sapientia siue diuina siue humana philosophia nuncupatur. Item alia diffinitio philosophiæ: ‘Philosophia est diuinarum humanarumque rerum in quantum homini possibile est probabilis scientia.’¹⁵ Item alia diffinitio: ‘Philosophia est ars artium et disciplina disciplinarum.’¹⁶*

[I.3.4] A. *Quot sunt ergo diuisiones philosophiæ?*

M. *Tres, id est phisis, ethis, lois, id est natura, mos¹⁷, ratio. Deinde diriuantur alia tria nomina: phisica, ethica, loica, hoc est naturalis, moralis, rationalis. Unde Isidorus dicit: ‘Philosophiæ species tripartita est: una naturalis, que grece phisica appellatur, in qua de naturæ inquisitione disseritur; altera moralis, que grece ethica dicitur, in qua de moribus agitur; tertia ratio<n>alis, que greco uocabulo loica appellatur, in qua disputatur quemadmodum in rerum causis uel uite moribus ueritas ipsa queratur. In phisica igitur causa querendi, in ethica ordo uiuendi, in loica ratio intelligendi uersatur.’¹⁸ Istæ sunt ergo tres partes philosophiæ, hoc est tres diuisiones sapientiæ: phisica, ethica, loica. In his etiam tribus generibus philosophiæ eloquia diuina consistunt. Nam aut de natura disputari solent, ut in Genesi et in Ecclesiasten; aut de moribus, ut in Prouerbiis et in Epistolis Pauli Apostoli et in aliis multis libris; aut de superioribus mysteriis caelestibus, hoc est de loica, ut in Cantica Canticorum et in Euangeliiis.*

[I.3.5] A. *Quis ergo inuenit istas tres partes philosophiæ?*

¹⁴ Isidore, *Etymologiae*, II, XXIV, 1.

¹⁵ Cassiodorus, *Institutiones*, II, III, 5 (cited by Isidore in *Etymologiae* II, XXIV, 9).

¹⁶ Cassiodorus, *Institutiones*, II, III, 5 (cited by Isidore in *Etymologiae* II, XXIV, 9).

¹⁷ *mora S ac.*

¹⁸ Isidore, *Etymologiae*, II, XXIV, 3.

M. Phisicam inuenit Tales Melesius, unus ex *septem* sapientibus grecorum. Ethicam inuenit Socrates. Loicam uero Plato inuenit philosophus.

[I.3.6] **Δ.** Ad quam igitur partem de his tribus partibus philosophiæ pertinet compotus?

M. Ad phisicam sine dubio.

[I.3.7] **Δ.** Phisica ergo quot diuisiones habet?

M. *Quattuor*, id est arithmetica¹⁹, geometrica, musica, astronomia. Boetius dicit: ‘Hoc est illud quadruuium²⁰ philosophiae, quo his uiandum est, quibus excellentior animus procreandis sensibus et intelligentia²¹ certiore producitur.’²²

[I.3.8] **Δ.** Arithmetica quid est?

M. Numeralis ars.

[I.3.9] **Δ.** Geometrica quid est?

M. Terre mensuratio.

[I.3.10] **Δ.** Musica quid est?

M. Modulatio.

[I.3.11] **Δ.** Astronomia quid est?

M. Astrorum lex.

[I.3.12] **Δ.** Ex his itaque *quattuor* diuisionibus phisicæ, id est naturalis, scientiæ, quæ prima discenda est?

M. Arithmetica procul dubio, quæ principium matrisque quodam modo ad cetera obtinet portionem. Arithmetica enim cunctis prior est, quia hanc ille [63v] huius mundanæ molis conditor Deus primum sue habuit ratiocinationis exemplar. Ad hanc cuncta constituit, hoc est per numeros omnia elementa constituit et ordinauit.

¹⁹ *S* here reads *arithmetica numerositas* (cf. *G* fol. 137v, *erithmetica numerositas*), where the latter word is probably an incorporated gloss to *arithmetica*. The word *numerositas* does not occur in *B*, fol. 22v.

²⁰ quadriuium *S ac, G*.

²¹ intelligentiæ *S ac*, intelligentiæ *G*.

²² Boethius, *De institutione arithmetica*, I, 1. This citation does not occur in *De ratione computandi*.

[I.4.1] **Δ.** Quis primus inuenit *numerum* apud Hebreos et Egyptios?

M. Abraham primus inuenit apud Hebreos, deinde Moyses. Et Abraham tradidit *istam scientiam numeri* ad Egyptios et docuit eos. Deinde Ioseph.

[I.4.2] **Δ.** Quis primus inuenit *istam scientiam* apud Grecos et Latinos?

M. Pithagoras apud Grecos primus inuenit, \A/puleus et Boetius apud Latinos, unde Isidorus dixit: ‘Numeri disciplinam apud Grecos primum Pit\h/agoram nuncupant conscripsisse. Ac deinde a Nicomaco diffusius esse dispositam, quam apud Latinos \A/puleus et deinde Boetius transtulerunt.’²³

[I.4.3] **Δ.** Quomodo numerus nominatur apud Hebreos et Chaldeos et Siros²⁴?

M. Hoc²⁵ est Nimia\ n²⁶ apud Hebreos et Chaldeos et Siros²⁷, apud Machedones calculus.

[I.4.4] **Δ.** Unde calculator nomen accepit?

M. A calculis, id est lapillis minutis quos antiqui manu tenentes componebant ad *numerum*. Apud alios Grecos cyclus uel rithmus, apud Egyptios latercus, inde laterculus diminutiue²⁸ dicitur. Apud Romanos autem et apud Latinos compotus uel numerus dicitur, et rima, unde rimarii appellantur.

[I.4.5] **Δ.** Illud nomen quod dicitur numerus, si simplex est an conpositum?

M. Conpositum scilicet ex duobus corruptis. Nume enim ex eo nomine quod est nummus²⁹ uenit. Rus autem ex eo nomine quod riuus diriuatur, ex riuo enim nummorum, id est ex multitudine census qui reddebatur regibus uel imperatoribus numerus nomen accepit, unde Isidorus dicit: ‘Nummus numero nomen dedit, et a sui frequentatione uocabulum indidit.’³⁰

[I.4.6] **Δ.** Numerus unde nomen accepit?

²³ Isidore, *Etymologiae*, III, II, 1.

²⁴ G; cyros S.

²⁵ Hec S ac.

²⁶ *Nimian* is also the reading of G (fol. 137v) and B (fol. 23r).

²⁷ G; cyros S.

²⁸ diminutiue in ext. marg.

²⁹ nummis S ac.

³⁰ Isidore, *Etymologiae*, III, III, 1.

M. A Numeria.³¹ Hinc Augustinus ait: ‘Numerus a Numeraria³² quadam dea nominatur’,³³ cuius sacerdotes retrouersis uultibus dona ferebant, et post oblata munera retro pergebant.

[I.4.7] **Δ.** Numerus quomodo diffinitur?

M. Isidorus diffiniuit dicens: ‘Numerus est multitudo ex unitatibus constituta. Nam unum semen numeri esse, *non numerum dicimus*.’³⁴ Item alius dicit: ‘Unus *non est numerus*, sed ab eo crescunt numeri.’³⁵ Tamen Donatus etiam unum pro numero posuit, dicens: ‘Numerus *est singularis ut hic magister*.’³⁶ Item Augustinus dicit: ‘Numerus *est singularis corporis ac uocis et significationis collectio*.’³⁷

[I.5.1] **Δ.** Quomodo nominantur nomina numeri apud Latinos ab uno usque ad mille et myriades?

M. Sic nominantur: I, II, III, IIII, V, VI, VII, VIII, VIII, X, XI, XII, XIII, XIII, XV, XVI, XVII, XVIII, XVIII, XX, XXX, XL, L, LX, LXX, LXXX, XC, C, CC, CCC, CCCC, D, DC, DCC, DCCC, DCCCC, Ī. Usque decem decies multiplicatus C facit; C decies multiplicatus mille facit; Ī decies multiplicatus myriadam facit; sic $\overline{XX}$ milia duas myriades, et XXX milia tres myriades, et XL milia quattuor myriades, et L milia quinque myriades, et LX milia sex myriades, et LXX milia septem myriades, et $\overline{LXXX}$ milia octo myriades, et $\overline{XC}$ milia nouem myriades; C milia X myriades, et ducenta milia XX myriades, et CCC milia XXX myriades, et CCCC milia XL myriades; D milia L myriades, DC milia LX myriades, DCC milia LXX myriades, DCCC milia LXXX myriades, DCCCC milia XC myriades, decies centum milia C myriades, et reliqua.

³¹ numera G.

³² Sic, for Numeria (same reading in G). B, on the contrary, reads Numeria (fol. 23r).

³³ Cf. Augustine, *De civitate Dei*, IV, 11.

³⁴ Isidore, *Etymologiae*, III, III, 1.

³⁵ Unidentified source (but cf. *De ratione computandi*, 7.3–4, where this statement is attributed to Augustinus).

³⁶ Cf. Donatus, *Ars Maior*, II, 7 (*Numeri sunt duo, singularis et pluralis: singularis, ut hic sapiens, pluralis, ut hi sapientes*). *Hic magister* is the reading of G, while S omits *magister*.

³⁷ Unidentified source.

[I.5.2] Δ. Ista nomina numeri [64r] que diximus, *per* quas notas significantur apud Latinos?

M. Per istas VII: I, V, X, L, C, D, M̄.

[I.5.3] Δ. Quomodo istę notę significant et multiplicant numeros?

M. Aut simpliciter solę significant, aut conpositę alia *cum* alia, aut multiplicatę *per* se.

[I.5.4] ³⁸M. Simpliciter significant sicut est I unus, V sola *quinque*, X sola *decem*, L *per* se quinquaginta, C *per* se tantum centum significat, D sola quingentos, M̄ sola *cum* titulo *supra* mille significat, uel I³⁹ *cum* titulo *supra* milia significat.⁴⁰

[I.5.5] Δ. Quomodo autem multiplicatę *per* se numeros generant?

M. Veluti *est* I primo duplicata *duos* significat, triplicata *tres*, quatriplicata *quattuor*.

[I.5.6] Δ. Pro quid ergo primo I unum significat?

M. Quid conuenientius *est* quam illa littera que minima *est* litterarum in caractere ut significaret illum numerum qui minimus est in numeris, hoc *est* unus. Nulla autem nota apud Latinos multiplicatur *per* se plus quam *per quattuor* uices, deinde V sequitur post primum .u.⁴¹ *quinque* significat.⁴² De his etiam numeris Isidorus pronuntiat dicens: ‘Unus a greco nomen trahit. Greci enim unum ena dicunt. Sic duo et III, quos illi dia et tria appellant. Quattuor uero a quadrata⁴³ nomen sumserunt. *Quinque* autem non secundum naturam, sed secundum placitum uoluntatis uocabulum acceperunt ab eo qui numeris nomina indidit. Sex autem et VII a greco ueniunt; in multis enim nominibus quę in greco aspirationem habent, nos *pro* aspiratione .s. ponimus, ut *pro* hex sex, et *pro* \h/epta *septem*

³⁸ Two consecutive sections begin here with the abbreviation for *magister*, suggesting that a question asked by the *discipulus*, originally placed between the two *magister*-sections, may have been omitted by mistake.

³⁹ G; mille S (*in sup. marg.*).

⁴⁰ uel mille ... significat *in sup. marg.*

⁴¹ .u. *in int. marg.*

⁴² B (fol. 23v) reads as follows: *deinde .u. sequitur .i. quinque significat.*

⁴³ Sic, for *a figura quadrata* (same reading in G).

dicunt, pro \h/erpillo herba serpillum.’⁴⁴ Item Priscianus hoc idem confirmat, dicens: ‘In aliis dictionibus quibusdam solent Aeoles sequentes uel in digamma uel in .s. conuertere aspirationem, ut hemis semis, heξ sex, heπτα septem.’⁴⁵ ‘Octo uero per translationem sicut illi, et nos ita; illi nea, nos nouem; illi deca, \nos/ X. Dicti autem decem a greca etymologia, eo quod ligent et coniungant’⁴⁶ infra decentes⁴⁷ numeros. Nam desmos coniungere uel ligare apud eos dicitur. Porro uiginti dicti quod fiunt X bis geniti, V pro .B. littera posita. Triginta, quod a ternario denario gignantur; si\c/ usque ad nonaginta. Centum uero uocati a cantu,⁴⁸ quod est circulum. Ducenti conpositum a duo et centum. Sic et reliqui usque ad mille. Mille autem a multitudine, unde et militia, quasi multitia, inde et miliatio, quę Greci, mutata littera, myriadas uocant.’⁴⁹

[I.5.7] Δ. Pro quid V quinque significat?

M. Quia quinta uocalis est in ordine uocalium. Pro hoc quinque significat, quia qualis est in ordine uocalium, talis est in numero. Hinc dicitur de V littera quinque uirgulas notamus. De X littera decem, nec V duplicatur, sed sequenter V I ponitur in numero: si unum I, sex; si duo, septem; si tres, VIII; si quattuor, VIII pro numero; plus non crescit. Deinde sequitur X que decem significat.

[I.5.8] Δ. Quis ostendit quod X decem significat?

M. Isidorus, dicens: ‘Nomina litterarum apud Grecos et uerba componunt et numeros faciunt. Latini autem numeros ad litteras non componunt, excepto X littera, quę et in figura crucem significat, et in numero decem demonstrat.’⁵⁰

⁴⁴ Isidore, *Etymologiae*, III, III, 1–3.

⁴⁵ Priscian, *Institutiones grammaticae*, XIII, 25.

⁴⁶ coniungent S ac.

⁴⁷ dicentes S ac (this is also the reading of G, fol. 138v). The reading *post correctionem* is here somewhat unclear: the corresponding passage in Isidore’s *Etymologiae* (III, III, 4) reads *iacentes*.

⁴⁸ Sic, for *cantho* (same reading in G).

⁴⁹ Isidore, *Etymologiae*, III, III, 3–5. The whole passage from *De his etiam numeris Isidorus pronuntiat* down to the end of I.5.6 does not occur in B, fol. 23v.

⁵⁰ Isidore, *Etymologiae*, I, III, 10–11.

Sequenter X multiplicatus I usque ad XIII, deinde sequitur XV; sequenter V multiplicata I quater XVIII facit.

[I.5.9] Δ. *Viginti*, quę nota significat?

M. X duplicata. Bis enim X habet, pro hoc dicitur *uiginti*, quasi bis *decem* geniti. Sic *triginta* ter *decem* genita.

[I.5.10] Δ. Per qualem notam significantur *triginta*?

M. Per X multiplicatum ter, et X non multiplicatur plus quam per tres uices.

[I.5.11] Δ. *Quadráginta*, per qualem notam significantur?

M. Per X et L.

[I.5.12] Δ. Quare scimus enim [64v] quia L quinquáginta significat et X *decem*?

Quare ergo non *sexáginta* significat X et L?

M. Propter mutatum ordinem, quia L prior *est* in ordine litterarum quam X. Pro hoc ergo quod X antecedit in illo ordine mutato, qui⁵¹ non *est* suus, perdidit suum numerum, id *est* X et alios, X de L littera sequente.

[I.5.13] Δ. *Quadráginta*, quare dicuntur?

M. Id *est* quater *decem* genita.

[I.5.14a] Δ. *Quinquáginta*, quare dicuntur?

M. Id *est* quinquies *decem* genita.

[I.5.14b] Δ. Quę nota significat *quinquáginta*?

M. L.

[I.5.14c] Δ. Quare?

M. Quia numerus principalis *est* in Lege quinquagenarius. In illo enim numero erat iubeleus, hoc *est* quinquagesimus/ annus. Conueniens autem erat ut ille numerus qui principatum in Lege Ueteri obtinet, hoc *est* quinquagenarius, per illam litteram quę prima *est* in illo nomine quod *est* lex significaretur L, L et X LX, L et XX LXX, L et XXX LXXX.

[I.5.15a] Δ. Quę notę significant *nonáginta*?

⁵¹ quod S ac, B, quod G.

M. Duę notę significant: aut X inter duas L, aut X ante C.

[I.5.15b] Δ. Quare? Scimus enim quia C *centum* significat et X *decem*; sic et duę LL *centum* significant, et X *decem*, sic debuerunt tunc C et X significare.

M. Pro hoc autem minuitur numerus, quia X antecedit illum ordinem, qui⁵² non est suus, sicut ante diximus.

[I.5.16a] Δ. Quę nota significat *centum*?

M. C.

[I.5.16b] Δ. Quare?

M. Quia prima est in illo nomine quod est *centum*. Usus erat apud ueteres per primam unam litteram nomina significare.

[I.5.16c] Δ. Unde dicitur *centum*?

M. A cantu, hoc est a circulo, id est ab illo choro cantantium. Mos enim erat apud ueteres C homines in choro cantantium habere. Inde *centum* a cantu uel a circulo dicitur. C duplicata significat ducentos, triplicata *trecentos*, quatriplicata *quadringentos*.

[I.5.17a] Δ. Quę nota significat quingentos?

M. D.

[I.5.17b] Δ. Quare?

M. Conueniens enim erat cum numerus prioris litterę, hoc est C, finitus, ut illa littera quę sequitur illam in ordine litterarum teneret numerum sequentem, hoc est *quingenti*; C sequente D sexcentos, duo CC sequentes D *septingentos*, \ter ducta C sequentes D *octingentos*/, quater multiplicato C sequentes D *octingentos*⁵³ significat.

[II] ITEM DE XIII DIVISIONIBUS TEMPORUM⁵⁴

[II.1.1] Δ. Diuisiones temporis quot sunt?

⁵² quod G.

⁵³ This is plainly a scribal mistake for *nongentos*. G has the same erroneous figure DCCC.

⁵⁴ This title is absent in G.

M. XIII, id est athomus, momentum, minutum, punctus, hora, quadrans, dies, ebdomada, mensis, uicissitudo triformis, annus, aetas, saeculum, mundus.

[II.1.2] **Λ.** Quomodo crescunt maiores numeri de minoribus?

M. Sic crescunt: *quingenti* LXIII athomi unum momentum efficiunt. Quattuor momenta minutum faciunt. Duo minuta et dimidium, id est X momenta, unum punctum complent. Quattuor puncti unam horam in sole faciunt, in luna autem V puncti unam horam efficiunt. VI horę unum quadra\ntem complent. *Quattuor* quadrantes unum diem complere uidentur. *Septem* dies septimanam faciunt. Quattuor septimanę unum mensem faciunt, sed talem mensem qui habet XXVIII dies, sicut est *Februarius*; illi autem menses qui XXX dies habent, sicut *Aprilis*, *Iunius*, *September*, *Nouember*, quattuor septimanas habent et duos dies; illi uero alii VII menses, id est *Ianuarius*, *Martius*, *Maius*, *Iulius*, *Augustus*, *October* et *December*, quia XXX et unum diem habent, *quattuor* septimanas habere uidentur et III dies. Et sic XII menses in anno colligunt L duas septimanas et unum diem. Quando autem bissextus *quarto* anno fuerit, tunc habet annus L duas septimanas et II dies. Tres menses unum tempus efficiunt, quod tempus uicissitudo triformis dicitur, quia tres menses [65r] habet unumquodque tempus de quattuor temporibus anni quę dicuntur uer, aestas, autumnus, hiemps; hęc *quattuor* tempora unum annum efficiunt. Quattuor anni bissextilem cyclum faciunt, quia post *quattuor* annos peractos bissextus interuenit. \Item XV anni cyclum indictionum complent./ Item XVIII anni cyclum decennouennalem perficiunt, id est terminos paschal\es/; sic XVIII anni cyclum lunarem implere uidentur. Aequali numero annorum, id est XVIII annis, cyclus epactarum in principio anni apud Romanos, hoc est in *Kalendis Ianuarii*, discurrit. Aequali ratione et alius cyclus epactarum in principio anni apud Hebreos et Grecos, hoc est in XII *Kalendas Aprilis*, per decem et nouem annos discurrit. Cyclus uero solaris XXVIII annis cursum suum finire perhibetur. Cyclus uero magnus, in quo est concordia inter solem et lunam usque in se reuertantur post *quingentos triginta* duos annos, tertio anno incipiente in se reuertitur. Tunc est uera concordia inter solem et

lunam, quando ad eundem diem mensis secundum solem, et ad illum diem septimanę, et ad easdem epactas unde primum coepit, in unum diem secundum rationem bissextus et saltus conueniunt. Hae itaque diuisiones temporis in solis ascensu descensuque et in luna crescente ac decrescente inueniuntur, et sic crescunt de minoribus ad maiora, hoc est ab athomis ad momentum, a momento in minutum, a minuto in punctum, a puncto in horam, ab hora in quadrantem, a quadrante in diem, a die in ebdomadam, ab ebdomada in mensem, a mense in tempus, a tempore in annum, ab anno in cyclum, a cyclo in aetatem, ab ętate in saeculum. Deinde plenitudo dicitur mundus. Has autem diuisiones temporis Isidorus in *li\bro Ethimologiarum* ostendit dicens: ‘Tempora diuiduntur momentis, punctis, horis, diebus, mensibus, annis, lustris, saeculis, ętatibus.’⁵⁵ Tempora dicta sunt eo quod momentis, horis, diebus, mensibus, annis, sęculisque ętatibus omnia mortalis uite curricula temperentur.⁵⁶ Diomedes autem tempus ita diffinit: ‘Tempus⁵⁷ est perpetuum, unitum, etiam \in/diuiduum, quod per se etiam in se reuoluitur. Sed tamen nos indiuiduo tempori partes uel diuisiones temporis iam ponimus, non tempus diidentes sed actum nostrum diuersum significantes.’⁵⁸

⁵⁵ Isidore, *Etymologiae*, V, XXIX, 1 (although notice that Isidore’s list actually does not feature the *puncta*).

⁵⁶ This sentence appears to be a direct citation from Bede, *De temporum ratione*, II, 1–5; it is in all likelihood an interpolation (possibly originating from incorporated *marginalia*). It is indeed highly significant that the whole passage from *Hae itaque diuisiones temporis in solis ascensu descensuque* down to the end of II.1.2 (*ut alterutrum dinoscere potuissent*) is completely absent from the early ninth-century copy of the *Standard DDT* contained in *B*, fol. 25r.

⁵⁷ *temporis G*.

⁵⁸ Cf. Diomedes, *Ars Grammatica* I (section *De temporibus verborum*). In Keil’s edition (in the first volume of the *Grammatici Latini*, p. 335), the passage in question reads somewhat differently: *In primis tempus per se nullum diremtum est omnino, cum per se in se revolvatur et sit perpetuo unitum. Verum quoniam differt noster actus nec semper idem est (aut enim facimus aut fecimus aut facturi sumus), hac ex re indiuiduo tempori inponimus partes temporis, non tempus diidentes sed actum nostrum diuersum significantes*. On the other hand, formulations very similar to the one found in *DDT* occur in numerous Hiberno-Latin grammatical tracts, e.g. *Ars Ambrosiana*, ll. 786–93 (where it is attributed to Probus); *Anonymus ad Cuimnanum*, XVIII, 29–34 (I owe these references to Jason O’Rorke).

Interrogat⁵⁹ *utrum* hae diuisiones temporis naturales sunt an *non*.⁶⁰ Non sunt, sed condictiue. Nam cum calculatoribus necesse esset uel diem in XII horas uel horam in quattuor punctos⁶¹, aut X minuta in XL momenta distribuere, quęsierunt sibi uocabula quibus id quod uolebant nuncuparent, ut alterutrum dinoscere potuissent.

[II.2.1] Has autem XIII diuisiones temporis quas diximus transcurrendo inuestigare diligentius debemus. Primum interrogandum est de prima diuisione temporis, quam diximus athomum.

[II.2.2] Δ. Athomus ergo quid est, et cuius lingua est, aut quomodo diffinitur, aut simplex nomen est an compositum?

M. Athomus grecum nomen est et compositum, et interpretatur indiuisibilis aut insecabilis. A enim apud Grecos prepositio interpretaetur; thomus autem diuisus uel diuisibilis interpretaetur.⁶²

[II.2.3] Δ. Athomus quomodo diffinitur?

M. Isidorus diffiniuit dicens: ‘Athom\o/s philosophi dicunt quasdam in mundo partes minutissimas, ut uisui non pateant nec sectionem recipiant.’⁶³ Huc illucque feruntur sicut tenuissimi [65v] pulueres qui infusi per fenestras radiis solis fugantur.’⁶⁴

[II.2.4] Δ. Quot sunt genera athomorum?

M. Quinque.

[II.2.5] Δ. Quę sunt?

⁵⁹ interrogantur G.

⁶⁰ The format of this indirect question differs markedly from the rest of the text, which is structured instead as a direct dialogue between student and teacher. This striking difference suggests that this whole passage (including the whole answer to the indirect question) may be an interpolation; indeed, its contents correspond very closely to Bede, *De temporum ratione*, III, 14–19 (cf. Appendix I, fn. 56 above). For this reason, I have marked off this section by printing it in smaller size as an independent paragraph.

⁶¹ punctis S ac.

⁶² thomus ... interpretaetur in ext. marg.

⁶³ recipiunt S ac, G.

⁶⁴ Isidore, *Etymologiae*, XIII, II, 1.

M. Id est athomus in corpore, athomus in sole, athomus in oratione, athomus in numero, athomus in tempore.

[II.2.6] Δ. Athomus ergo in corpore quid est?

M. Quicquid *mini\m/um* est in corporibus, quod secari aut diuidi *non* potest. Athomus dicitur uelut Isidorus minutissima⁶⁵ grana arenarum,⁶⁶ ut capillus dixit: ‘findere me nulli possunt, praecidere multi’,⁶⁷ uel etiam pilus in corpore, qui per longum uix diuidi potest. Athomus in sole: illi tenuissimi pulueres quod diximus radiis solis fugari. Athomus in oratione, ut est littera: diuidis enim partem orationis quamlibet in syllabas, syllabas diuidis in litteras, \litteram/ diuidere non potes. Inde Seregius *grammaticus* dixit quod cum omnis oratio soluitur in uerba, uerba denuo soluuntur in syllabas, syllabę rursum soluuntur in litteras; sola littera non habet in quo soluatur, ideo a philosophis athomus dicitur.⁶⁸

[II.2.7] Δ. Quomodo est athomus in numero?

M. Sic est: octo diuidis in bis quaternos; IIII diuidis in bis binos; duos diuidis in bis unos; unum diuidere *non* potes. Pro hoc athomus dicitur in numero.

[II.2.8] Δ. Quomodo est athomus in tempore?

M. Sic est: momentum diuidis in XII partes; unamquamque partem de XII partibus momenti diuidis in XLVII; quadragesima septima pars *duodecima* pars⁶⁹ est momenti. Sic est athomus in tempore. Si autem colligas simul XLVII duodecies inuenies DLXIII athomos, et tantus numerus athomorum facit unum momentum.

⁶⁵ minutissimi *S ac, G.*

⁶⁶ Cf. Isidore, *Etymologiae*, XIII, II, 2: *Diuidis eum in partes et partes ipsas diuidis in grana, ueluti sunt harenae; rursum que ipsa harenae grana diuide in minutissimum puluerem, donec, si possis, peruenias ad aliquam minutiam, quae iam non sit quae diuidi uel secari possit.*

⁶⁷ Symphosius, *Aenigmata*, §58.

⁶⁸ Cf. e.g. Clemens Scottus, *Ars grammatica* (ed. Tolkiehn, p. 14), as well as an anonymous passage from Bern, Burgerbibliothek, 207 (edited in H. Hagen, *Anecdota Helvetica quae ad Grammaticam Latinam spectant* (Leipzig, 1870), p. xxiv), etc.; cf. also Isidore, *Etymologiae*, XIII, II, 4.

⁶⁹ *Sic*, for *duodecimae partis*. A few words appear to have been omitted here by the scribe of G, where this passage reads as follows: *Sic est · momentum diuidis in XII partes unamquamque partem de XII partibus momentum diuidis in XLVII in quadragesima septima pars legas simul XLVII duodecies inuenies DLXIII athomos et tantus numerus athomorum facit unum momentum.*

[II.3] Δ. *Momentum* quid est, et quomodo diffinitur secundum sonum, hoc est secundum superficiem, et secundum sensum, hoc est secundum substantiam quę intus latet in sono?

M. Sic diffinitur *momentum* secundum sonum: Isidorus dicit: ‘*Momentum* minimum atque angustissimum tempus, a motu syderum dictum’, hoc est a motu solis et lune. ‘Est enim extremitas horę in breuibz interuallis, cum sol sibi aliquid cedit atque succedit.’⁷⁰ Item alia diffinitio momenti secundum sensum substantię sic diffinitur, Isidoro dicente: ‘*Momentum* est certus lectus solis in cęlo.’⁷¹ Per XL uices iam hora est. Quattuor momenta unum minutum faciunt.

[II.4] Δ. Minutum quomodo diffinitur?

M. Isidorus diffiniuit dicens: ‘Minutum dicitur uelut minus momentum, quia minus numerat quod maius implet.’⁷² Duo minuta et dimidium, hoc est decem momenta, punctum faciunt.

[II.5] Δ. Punctus unde dictus est, et quomodo diffinitur?

M. Isidorus ostendit cum dixit: ‘Punctum \a/⁷³ pungendo dictum est, eo quod quibusdam punctionibus certę designationis in horologiis designatur.’⁷⁴ Quattuor puncti, hoc est XL momenta, unam horam faciunt.

[II.6.1] Δ. Hora cuius lingua est, quomodo diffinitur?

M. Hora grecum nomen est, et interpretatur series⁷⁵ uel finis, aut terminus siue umbra.

[II.6.2] Δ. Hora unde nomen accepit?

⁷⁰ Isidore, *Etymologiae*, V, XXIX, 1 (the clarification *hoc est a motu solis et lune* is probably an incorporated gloss).

⁷¹ The attribution of this citation to Isidore is spurious. However, the image of a *momentum* as a *lectus solis* appears in the *Munich Computus* (3.10) and in many other Irish computistical texts (cf. Warntjes, *Munich Computus*, 12–13).

⁷² Again, this is not a citation from any of Isidore’s extant works, but the same explanation also occur in the *Munich Computus* (4.6–8), where it is likewise ascribed to Isidore (cf. Warntjes, *Munich Computus*, 14–15).

⁷³ Notice that *a* is omitted altogether in *G* (fol. 140r).

⁷⁴ Again, this citation often occurs in Irish *computistica*, where it is typically attributed (falsely, no doubt) to Isidore (cf. Warntjes, *Munich Computus*, 14–15).

⁷⁵ series *S pc*, *G*; syries *S ac*.

M. De horologio, unde Isidorus dicit: ‘Hora de horologio dicitur et horologium de hora.’⁷⁶ Item alia diffinicio, Isidorus dicit: ‘Oras maris et fluuiorum et uestimentorum dicimus, id est extremitates siue terminos. Hora autem finis temporis.’⁷⁷

[II.6.3] A. Quomodo discernitur in horthographia inter oras maris et uestimentorum et fluuiorum, et inter horam temporis?

M. Oras maris et uestimentorum aut fluuiorum **[66r]** quando dicimus sine aspiratione; hora autem, hoc est finis temporis, cum aspiratione.⁷⁸ VI horę unum quadrantem faciunt.

[II.7] A. Quadrans quid est, et quomodo diffinitur? Quomodo uocatur apud Hebreos et Grecos et Latinos?

M. Sic diffinitur: quadrans dicitur a quarta parte untie, qui alio nomine dicitur sicilicus, id est sex scripuli quem Hebrei quodrantem, Greci uero dodrantem, Latini quadrantem uocant. Dicitur enim et quadrans maior qui habet tres uncias, hoc est quarta pars assis. Assis enim duodecim uncias habet. Sic etiam et quadrans in tempore sex horarum, quarta pars diei est naturalis, quia quattuor quadrantes unum diem perficiunt, qui dies XXIII horas habet.

[II.8.1] A. Dies unde nomen accepit?

M. Id est a diuisione, eo quod diuidit lucem a tenebris. Siue dies dicti sunt a diis quorum nomina Romani quibusdam syderibus sacrauerunt.

[II.8.2] A. Dies quomodo diffinitur?

M. Isidorus diffiniuit dicens: ‘Dies legitimus est uiginti quattuor horarum, usque dum dies et nox spacia sui cursus ab oriente in occidentem et ab occidente in orientem solis uolubilitate concludat.’⁷⁹

[II.8.3] A. Quibus modis dies dicitur?

⁷⁶ Rather than being taken from one of Isidore’s works, this explanation matches substantially what we find in the *Munich Computus* (6.4–5): *horologium et horam de horologio dicimus* (for further references, cf. Warntjes, *Munich Computus*, 16–7).

⁷⁷ Isidore, *Etymologiae*, V, XXIX, 2.

⁷⁸ G; aspiracione S.

⁷⁹ Isidore, *Etymologiae*, V, XXX, 1 (slightly rephrased).

M. ⁸⁰Duobus modis.

[II.8.4] Δ. Qui?

M. Dies naturalis et dies artificialis.

[II.8.5] Δ. Dies naturalis quid est?

M. Id est dies legitimus ab ortu solis donec rursus oriatur, et ille dies habet XXIII horas in se.

[II.8.6] Δ. Quot sunt diuisiones diei illius naturalis?

M. Duę, id est dies et nox. Inde Isidorus dicit: ‘Spacia diei naturalis duo sunt, id est interdianum et nocturnum.’⁸¹ Quando dicit dianum spacium, diem significat; quando autem nocturnum spacium, nox est.

[II.8.7] Δ. Quis ergo demonstrat quod dies et nox simul dies dicitur?

M. In scriptura diuina ostenditur ubi legitur: ‘Et factum est uespere’, hoc est nox ‘et mane, dies unus.’⁸² Tunc ostendit quod nox et dies simul dies nuncupantur.

[II.8.8] Δ. Quid est ergo ille dies artificialis?

M. Ab ortu solis usque ad occasum, dies artificialis dicitur, id est praesentia solis super terram. Unde Isidorus dicit: ‘Dies est presentia solis, siue sol super terram, sicut nox dicitur absentia solis, id est sub terris.’⁸³ Diffinitio diei bifarie diuiditur, hoc est uulgariter, id est abusiue, et naturaliter, id est proprie.

[II.8.9] Δ. Quomodo ergo dies naturalis et dies artificialis simul diffinitur?

M. Isidorus diffiniuit dicens: ‘Dies gemine appellari solet, proprie ab ortu solis donec rursus oriatur, abusiue ab ortu solis quousque ad occasum perueniat.’⁸⁴

[II.8.10] Δ. Quot sunt spacia artificialis diei?

M. Tria.

[II.8.11] Δ. Quę?

M. Mane, merities, supraema.⁸⁵

⁸⁰ *Id est* erased here. Indeed, *G* reads: *M. id est duobus modis*.

⁸¹ Isidore, *De natura rerum*, I, i.

⁸² Gn 1: 5 (*hoc est nox* is an incorporated gloss to *uespere*).

⁸³ Isidore, *Etymologiae*, V, XXX, 1.

⁸⁴ Isidore, *De natura rerum*, I, i.

⁸⁵ *supraema* *S ac, G*.

[II.8.12] Δ. Mane quid est? Et quomodo diffinitur, uel quot horas habet?

M. Mane dicitur ab ortu solis usque ad horam post terciam. Meridies ab hora tertia usque ante nonam. Suprema ab hora ante nonam usque ad occasum solis.

[II.8.13] Δ. Mane ergo quomodo diffinitur?

M. Isidorus diffiniuit dicens: ‘Mane, lux matutina et plena, et dictum mane a mano⁸⁶.’ Manum enim propterea ueteres manum diem appellabant, scilicet a puritate antiqui bonum dicebant. ‘Quid enim melius est luce?’⁸⁷ Siue ergo mane dicitur a manibus, id est diis infernorum. Gentiles enim estimabant quando sol recedit a nobis quia dii infernorum⁸⁸ illum ad se traxissent.

[II.8.14] Δ. Meridies quomodo diffinitur?

M. Isidorus diffiniuit cum dixit: ‘Meridies dicitur quasi [66v] medidies⁸⁹, hoc est medius dies.’ Siue meridies dicitur quasi pura dies. ‘In toto enim die nichil purius est meridie. Antiqui enim merum purum dicebant.’⁹⁰

[II.8.15] Δ. Suppraemum quare dicitur?

M. Hoc est supprimendo: tunc enim sol inclinatur ad occasum. Hęc ergo tria spacia artificialis diei a cursu solis temperantur: mane dicitur ab ortu solis usque dum sol ascenderit in altitudinem cęli; meridies autem dicitur quando per medium cęlum in altitudine sol currit; suppraemum autem quando sol de altitudine celi descendit ad occasum. Item aliu\ d/ spatium diei est, quę naturalis dicitur.⁹¹

⁸⁶ mona G.

⁸⁷ Isidore, *Etymologiae*, V, XXX, 14 (somewhat modified).

⁸⁸ *Gentiles enim estimabant quando sol recedit a nobis quia dii infernorum* omitted in G (fol. 140v).

⁸⁹ A few letters appear to have been erased between *medi* and *dies*; these two parts were subsequently linked to each other by means of a curved line joining *-i* and *d-*, making it clear for the reader that *medi* and *dies* should be read as a single word *medidies*.

⁹⁰ Isidore, *Etymologiae*, V, XXX, 15 (somewhat modified).

⁹¹ The scribe first wrote *naturalis quę dicitur*, but then changed the word-order to *quę naturalis dicitur* by means of *signes de renvoi*. G presents the word-order *naturalis quae dicitur*; moreover, unlike in S, in this manuscript the whole sequence *Item alium spatium diei est naturalis quae dicitur nox quomodo diffinitur* constitutes the disciple’s question. Judging from what can be read in B, fol. 27r, the reading of G may well be the correct one here (the Basel manuscript reads: Δ. Item alium spatium diei naturalis quod dicitur nox quomodo difinitur).

[II.8.16] Δ. Nox quomodo diffinitur?

M. Isidorus diffiniuit dicens: ‘Noctem autem fieri dicimus umbram terrarum, quam datam ad quietem corporis, non ad alicuius operis officium credimus.’⁹²

Unde Virgilius dixit: ‘Ruit Oceano nox, inuoluens umbra magna terramque polumque.’⁹³ Et Salomon sacris litteris expressit de *Christo* dicens: ‘Qui pascitur inter lilia donec aspiret dies et inclinentur umbrę’⁹⁴; eleganti sensu descensionem noctis inclinationem appellat umbrarum.⁹⁵ Item alia diffinitio: ‘Noctem autem fieri dicimus pro animalibus quibusdam solem non ferentibus, et pro temperantia laboris humani.’⁹⁶

[II.8.17] Δ. Nox unde nomen accepit?

M. Nox a nocendo dicta est, eo quod oculis noceat.

[II.8.18] ⁹⁷Δ. Quomodo dies habet initium apud Chaldeos et Egyptios et Hebreos et Romanos?

M. Dies secundum Chaldeos et Persas ab ortu solis incipit, quia Chaldei primum solem adorabant. Secundum Aegyptios autem dies incipit ab occasu solis quando Vesper stella oritur, quę dicitur alio nomine Lucifer, et illam stellam Aegyptii primum adorabant. Secundum Hebreos autem et Athenienses a sexta hora diei incipit dies, quia Hebrei secundum lunam numerant, et sic putant quod media die lune ętas commutetur⁹⁸ aut incendatur. Secundum Romanos autem dies naturalis

⁹² Isidore, *De natura rerum*, II, 1.

⁹³ Virgil, *Aeneis*, II, 250–251 (cited through Isidore, *Etymologiae*, V, XXXI, 3).

⁹⁴ Ct 2: 16–17.

⁹⁵ This explanation of the passage from the Song of Songs appears to be based on Bede, *De temporum ratione*, VII, 9–11, and may therefore be an interpolation. Significantly, the whole passage from *Et Salomon sacris litteris expressit* down to *inclinationem appellat umbrarum* does not occur at all in *B*, fol. 27r.

⁹⁶ Based on Isidore, *Etymologiae*, V, XXXI, 1–2, but in all likelihood cited here through the *Munich Computus* (9.4–6) or some analogous Irish computistical text (cf. Warntjes, *Munich Computus*, 28–9).

⁹⁷ Note that this question concerning the beginning of the day and its related answer interrupt the sequence of questions and answers about the night, which however, resumes immediately afterwards. Yet, this question does occur in this same position in *B*, fol. 27r, so that it may well go back to an early redaction of *DDT*, or even to the early eighth-century original.

⁹⁸ *commutatur G*.

incipit a media nocte usque ad mediam noctem, *propter illam auctoritatem* Hyeronimi qua dixit: ‘Quia in media nocte factus est mundus et in media nocte iterum destruetur.’⁹⁹ In primordio creaturarum tenebrę erant *super faciem abyssi*. Dixitque Deus: ‘Fiat lux.’¹⁰⁰ De qua luce luminaria formata esse creduntur. Philosophi umbram terrae exaltari dicunt ad aeris aetheris confinium, sensimque diminui ac deficere priusquam ad ethera *pertingat*¹⁰¹, ad inst\ar pyramidum.¹⁰²

[II.8.19] Δ. Diuisiones noctis quot sunt?

M. VII.

[II.8.20] Δ. Quę?

M. Id est uesperum, crepusculum, conticinium, intempestum uel intempestium, gallicinium, matutinum, diluculum.

[II.8.21] Δ. Vesperum unde nomen accepit?

M. Ab Hespero rege, a quo primum Hesperia, id est Italia, dicta est. Ab Hesperia autem, id est ab illa prouintia, Vesper stella nominatur, quia illi nautici et mercatores qui de Grecia solebant uenire ad Italiam aspiciebant in nocte illam stellam claram quę dicitur Lucifer, quę eis lucebat per noctem nauigantibus. Deinde Vesper illam stellam uocauerunt, quia de parte Hesperię eis lucebat. De qua stella Virgilius dixit: ‘Ante diem clauso componit Vesper Olimpo.’¹⁰³ Ab illa autem stella, quę Vesper dicitur, Vesperum uel Vespera nominatur.

[II.8.22] Δ. Crepusculum quid est?

M. Hoc est dubia lux; nam creperum dubium dicimus, hoc est inter lucem et tenebras.

[II.8.23] Δ. Conticinium quid est?

⁹⁹ For this sentence spuriously attributed to Jerome, see fn. 120 to the text of the article above.

¹⁰⁰ Gn 1: 3.

¹⁰¹ *pertinguat S.*

¹⁰² The conclusion of this section appears to be based on Bede, *De temporum ratione*, VII, 17–19, and may well be interpolated. Significantly, it does not occur in *B*, fol. 27r.

¹⁰³ Virgil, *Aeneis*, I, 369 (undoubtedly cited through Isidore, *Etymologiae*, V, XXXI, 5).

M. Hoc est silentium, con[67r]ticescere enim dicitur quasi contacere. Inde Isidorus dixit: ‘Conticinium dicitur quando omnes silent. Conticescere enim silere est.’¹⁰⁴

[II.8.24] **Δ.** Intempestium quid est?

M. Hoc est intemporaneum et inactuosum tempus, quasi sine non¹⁰⁵ tempore. Item intempestium dicitur, hoc est inactuosum, unde Isidorus: ‘Quando nichil agi potest, et omnia sopore quieta sunt.’¹⁰⁶

[II.8.25] **Δ.** Gallicinium unde nomen accepit?

M. Isidorus ostendit: ‘Gallicinium dictum est propter gallos, lucis praenuntios.’¹⁰⁷

[II.8.26] **Δ.** Matutinum tempus quid est?

M. Hoc est prima diei pars ante solis ortum.

[II.8.27] **Δ.** Diluculum quid est?

M. Quasi diei lux. Tunc enim primum sol oritur, inde diluculum diminutivum de luce solis nominatur.

[II.8.28] **Δ.** De his ergo duabus divisionibus diei naturalis quas diximus, id est dies et nox, quæ præcedit in tempore?

M. Dies sine dubio. Ab initio enim mundi usque ad resurrectionem Christi dies præcedebat noctem. A resurrectione autem Christi usque ad iudicium nox præcedit diem. Inde Isidorus dixit: ‘Dies autem in principio operum Domini a lumine habebat exordium, ad significandum hominis lapsum; nunc autem a tenebris ad lucem, ut non dies obscuratur in noctem, sed nox luceat in diem, sicut scriptum est “de tenebris lumen clarescere”¹⁰⁸ fecit.’¹⁰⁹ Dies ergo scientiam diuinæ legis significat. Nox uero ignorantia et cecitatem morum, secundum

¹⁰⁴ Isidore, *Etymologiae*, V, XXXI, 8.

¹⁰⁵ A line was drawn under *non*, meaning that this word should be expunged. *G* (fol. 141v) reads *tempus quassi non tempore*, but *B*, fol. 27v, reads *tempus quasi sine tempore*.

¹⁰⁶ Isidore, *Etymologiae*, V, XXXI, 9.

¹⁰⁷ Isidore, *Etymologiae*, V, XXXI, 11.

¹⁰⁸ 2 Cor 4: 6.

¹⁰⁹ Isidore, *Etymologiae*, I, III, 12.

prophetæ dictum: ‘Nocti adsimilavi matrem tuam, factus est populus meus tanquam non habens scientiam’¹¹⁰, quasi dixisset: non habens lucem. Nonnunquam dies prosperitatem significat, nox uero aduersitatem. Septem dies septimanam faciunt.

[II.9.1] **Δ.** Illud nomen quod ebdomada dicitur, si simplex est an compositum nos scire conuenit.

M. Compositum sine dubio ex duobus corruptis. Eb enim ab eo nomine quod grece epta dicitur venit, quod interpretatur septem; ma autem ab eo nomine quod est mane uel mano, die id est lux, compositum, unde Isidorus dicit: ‘Hanc septimanam uocamus nos quem septem luces habet’¹¹¹, id est septem dies.

[II.9.2] **Δ.** Ebdoma quomodo diffinitur?

M. Isidorus diffiniuit dicens: ‘Ebdoma’¹¹² apud Grecos et Romanos septem dierum cursu peragitur. Apud Hebreos autem septem anni sunt; declarat hoc Danihel de *septuaginta* ebdomadibus’¹¹³, quas numerauit et prophetauit usque ad *Christum* ducem, dicens: ‘Numerabis *septuaginta* ebdomadas usque ad *Christum* ducem’¹¹⁴, hoc est *quadringentos* XC annos.

[II.9.3] **Δ.** Quis ergo primum septimanam et dies septimanę composuit et nuncupauit?

M. Deus sine dubio, quando in sex diebus omnes creaturas creauit, et in septimo die requieuit. Hinc ipse Dominus in Lege dixit: ‘Sex enim diebus operaberis et facies omnia opera tua. Septimo autem die sabbati Domini tui non facies omne opus.’¹¹⁵ In sex enim diebus fecit Deus cęlum et terram, mare et omnia quę in eis sunt, et requieuit in die septimo.

[II.9.4] **Δ.** Dies septimanę, quomodo apud Hebreos nominantur?

¹¹⁰ Os 4:5–6.

¹¹¹ Isidore, *Etymologiae*, V, XXXII, 1.

¹¹² ebdoma\da/ S ac.

¹¹³ Isidore, *De natura rerum*, III, 1.

¹¹⁴ Cf. Dn 9: 25, *scito ergo et animadverte ab exitu sermonis ut iterum aedificetur Hierusalem usque ad christum ducem ebdomades septem et ebdomades sexaginta duae erunt.*

¹¹⁵ Ex 20: 9-10; Dt 5: 13-14.

M. Sic dicuntur: prima sabbati uel una sabbati, secunda sabbati, tertia sabbati, quarta sabbati, quinta sabbati, sexta sabbati, sabbatum. Propterea autem a sabbato omnes dies [67v] septimanę nominantur apud Hebreos, quia sabbatum principalis dies erat apud Hebreos, et in eo requies erat in omnibus hominibus secundum preceptum Domini.

[II.9.5] **Δ.** Quomodo ergo hi dies septimanę apud paganos, hoc est apud gentiles, nominantur?

M. Sic dicuntur: dies solis, dies lunę, dies Martis, dies Mercurii, dies Iouis, dies Ueneris, dies Saturni. Propterea autem gentiles hæc nomina diebus septimanę inposuerunt propter honorem deorum quos illi adorabant quasi deos. Eisdem monstris dies suos quibus et errantia sydera consecrabant. Estimabant enim se a sole spiritum habere, quia sol, in medio planetarum positus, totum mundum ad instar spiritus calefacere et quasi uiuificare uidetur, Ecclesiastę adtestante: ‘Girans girando uadit spiritus et in circulos suos reuertitur.’¹¹⁶ A¹¹⁷ luna corpus, que humoris ministerio incrementum corporibus suggerit cunctis. A¹¹⁸ Marte feruorem, utpote que soli proxima natura est feruens. A¹¹⁹ Mercurio, perpetuo circa solem discurrendo¹²⁰, quasi exhausta sapientię¹²¹ luce, radiari sapientiam et uerbum putabant. Ab Ioue,¹²² qui frigore Saturni et ardore Martis hinc inde temperatur, temperantiam. A¹²³ Uenere, propter luminis uenustatem quod a solis uicinitate recipit, uoluptatem.¹²⁴ A[ut] Saturno, eo quod tardior sit ceteris

¹¹⁶ Jerome, *Commentarius in Ecclesiasten*, I, ad versum 6 (cf. Ecl 1: 6).

¹¹⁷ aut *S ac*.

¹¹⁸ aut *S ac*.

¹¹⁹ aut *S ac*.

¹²⁰ Although there may be a correction sign above the second *d*, it is difficult to understand what this may be. The reading of *G* (fol. 142r) is simply *discurrendo*.

¹²¹ sapienti *G*.

¹²² The correct reading *ab Ioue* is here supplied from *G* (fol. 142r); *S* presents the corrupt reading *abusiu* (this corruption may indeed have been spotted by the reader / corrector who added a *require* sign in the exterior margin beside this passage).

¹²³ aut *S ac*.

¹²⁴ uoluntatem *G*.

planetis, pro eo *quod* superior incedit, tarditatem, id est senectutem, sperabant.¹²⁵ Inde Isidorus dicit: ‘Ex his septem stellis quas gentiles ex nomine deorum suorum septem dies septimanę nominauerunt, primum diem a sole appellauerunt, quia princeps est omnium syderum¹²⁶, sicut idem dies caput est omnium dierum. Secundum diem a luna nominauerunt, quę soli splendore et magnitudine proxima est, et ex eo mut\u/at lumen. Tercium diem a stella Martis, quę Uesper uocatur. Quartum diem a stella Mercurii, quam quidam candidum circulum dicunt. Quintum diem a stella Iouis, quam Fētuntem aiunt. Sextum diem a Ueneris stella, quam Luciferum asserunt, quę inter omnia sydera plus lucis habet. Septimum diem a stella Saturni nominauerunt, que stella sexto cęlo locata XXX annis fertur explere cursum suum.’¹²⁷

Prima dies Phoebi sacratus numine fulget. / Vindicat et lucens¹²⁸ feriam sibi luna secundam. / Inde dies rutilat iam tertia Martis honore. / Mercurius quantum splendentem possidet altum. / Iupiter ecce sequens quintam sibi iure dicauit. / Concordat Veneris magno¹²⁹ cum nomine sextus. / Emicat alma¹³⁰ dies Saturno septima summo¹³¹.¹³²

[II.9.6] **Δ.** Hi ergo dies septimanę quomodo apud *Christianos* nominantur?

M. *Sanctus* Silvester apostolicus sic docuit et predicauit *Christianis*, ut non nominarent dies septimanę iuxta ritum gentilium, sed Cristiana obseruatione sic nominarent, quasi faria: *prima feria*, id est dies dominicus, *secunda feria*, *tertia*

¹²⁵ The whole section from *Eisdem monstris dies suos* down to *tarditatem, id est senectutem, sperabant* is heavily based on Bede, *De temporum ratione*, VIII, 34–50, and may well be interpolated. Indeed, it does not occur at all in *B*, fol. 28r.

¹²⁶ appellauerunt ... syderum in sup. marg.

¹²⁷ This is a re-elaboration of Isidore, *Etymologiae*, V, XXX, 5–8.

¹²⁸ lucēs *G*.

¹²⁹ magne *G*.

¹³⁰ almas *S ac*; almus *G*.

¹³¹ summus *G*.

¹³² This poem is edited (from the manuscript Rome, BAV, Reg.lat.215, fol. 127r) in A. Riese (ed.), *Anthologia Latina sive Poesis Latinae Supplementum (Pars Prior: Carmina in Codicibus Scripta)*, fasc. I (Leipzig 1869), item 488. These verses occur quite often in Carolingian computistical manuscripts, and their presence in *S* and *G* (fol. 142r) may well be due to an interpolation. Indeed, these verses do not occur at all in *B*, fol. 28v.

feria, quarta *feria*, quinta *feria*, sexta *feria*, septima *feria*, nichil ueritus grammaticorum ferulas, qui sicut *Kalendas*, *Nonas* et *Idus*, ita etiam *ferias* plurali numero dixerunt.¹³³ Ab initio primum factę sunt creature, cęlum et terra et lux; inde *feria* dicta est dies¹³⁴ dominicus a fiendo, quia in illa die dixit *Deus*: ‘Fiat lux.’¹³⁵ Inde Isidorus dicit: ‘Ipse est enim primus dies *saeculi*; in ipso formata sunt elementa mundi, in ipso creati sunt angeli, in ipso etiam *Christus* resurrexit [68r] a mortuis’¹³⁶, et in ipsa die manifesta\ta/¹³⁷ sunt mysteria *Christi* et ecclesię ad Iohannem in Phatmos insula, sicut ille dixit: ‘Fui in spiritu in die dominico.’¹³⁸ Quattuor septimanę unum mensem faciunt.

[II.10.1] <Δ.> Mensis cuius lingua est et unde diriuatur?

M. Mensis grecum nomen est et de lunae nomine diriuatur. Mene enim apud Grecos luna dicitur, inde menes, hoc est menses, diriuantur. Et sic interpretatur mensis lunaris, quia ex luna nomen accepit. Unde et apud Hebreos menses legitimi non ex solari circulo, sed ex lunę cursu enumerantur.

[II.10.2] Δ. Mensis quomodo diffinitur?

M. Isidorus diffiniuit dicens: ‘Mensis est luminis lunaris circuitus ac reintegratio siue noua ad nouam.’¹³⁹

[II.10.3] Δ. Quando ergo menses primum inuenti sunt?

M. Antiqua traditio est. Legimus etiam ante diluuium menses fuisse nominatos, unde Isidorus dicit: ‘In sancta scriptura ostenditur XII menses anni fuisse nominatos etiam ante diluuium. Sic enim in Genesi legimus: “Aqua autem minuebatur usque ad duodecimum mensem. Undecimo autem mense, prima die

¹³³ This grammatical observation is based on Bede, *De temporum ratione*, VIII, 74–7. It does not occur in *B*, fol. 28v.

¹³⁴ The word *dies*, omitted in *S*, is here supplied from *G*.

¹³⁵ Gn 1: 3.

¹³⁶ Isidore, *De ecclesiasticis officiis*, I, 25.

¹³⁷ manifesta *G*.

¹³⁸ Apc 1: 10.

¹³⁹ Isidore, *Etymologiae*, IV, I, 1.

mensis, apparuerunt cacumina montium”¹⁴⁰.¹⁴¹ Et illos menses *secundum* lunam computabant Hebrei, et sic semper faciunt. Et initium mensis est apud Hebreos lunę accensio. Et ille mensis est ab accensione usque ad aliam accensionem, siue a plenilunio usque ad plenilunium, hoc est a quinta decima luna usque ad quartam decimam. Sic enim Dionisius annum *secundum* menses lunares numerat. Apud antiquos ergo, sicut diximus, menses *secundum* lunam numerabant. Nunc autem et *secundum* solem et *secundum* lunam menses dicuntur, quia sicut in luna luationes dicuntur¹⁴², sic etiam et in sole menses solares dicuntur. Inde Isidorus dicit: ‘Ex sole ergo sunt horę, ex ipso etiam sunt dies cum ascenderit, ex ipso nox cum occiderit¹⁴³; ex ipso menses et anni numerantur, ex ipso uicissitudines quattuor temporum moderantur.’¹⁴⁴

[II.10.4] Δ. Qui primi menses solares inuenerunt?

M. Egyptii, inde Isidorus dicit: ‘Egyptii primum propter lunę uelotiorem cursum, et ne error ex computationis uelocitate accidisset, ex solis cursu menses inuenerunt, quoniam tardior solis motus facilius poterat compræhendi.’¹⁴⁵

[II.10.5] Δ. In quo numero dierum menses apud Aegyptios habentur?

M. Hoc est: unusquisque mensis apud illos XXX dies habet, et sic in XII mensibus CCCLX dies colliguntur. Quinque autem dies qui supersunt intercalares uocantur apud Eęgyptios, hoc est interpositi dies inter finem anni et principium. Inde Augustinus dicit: ‘Annus etiam unus, si XII menses integri considerentur, quos XXX dies complent (talem quippe mensem ueteres obseruarunt, quem circuitus lunaris ostendit), senario numero pollet.’¹⁴⁶ Sexies enim LX CCCLX dies sunt, qui sunt integri XII menses. Et sicut mensem lunarem circuitus lunę ostendit, sic

¹⁴⁰ Cf. Gn 8: 5.

¹⁴¹ Isidore, *De natura rerum*, IV, 5.

¹⁴² quia sicut ... dicuntur in inf. marg.

¹⁴³ ex ipso ... occiderit in ext. marg.

¹⁴⁴ Isidore, *De natura rerum*, XVII, 4.

¹⁴⁵ Isidore, *Etymologiae*, V, xxxiii, 2.

¹⁴⁶ Augustine, *De Trinitate*, IV, 4.

annus solaris hoc numero dierum animaduertendus est. Restant autem v dies et quadrans diei ut sol impleat cursum suum annumque concludat.

[II.10.6] Δ. Hi ergo menses, in quo numero fuerunt apud antiquos, et quantos dies habuit unusquisque mensis apud illos, et quis mensis erat apud illos in prin<ci>pio anni, et quantos menses habuerunt in anno, scire nos conuenit.

M. Archades Greci [68v] annum suum tribus mensibus explicabant, et ita unum annum quem modo habemus in XII mensibus, illi diuidebant in quattuor annos, et sic erat unus apud illos: a solstitio hyemali usque ad equinoctium uernale, hoc est tribus mensibus, et sic annum sequentem ab equinoctio uernali usque ad solstitium aestiuum. Tercium autem annum a solstitio aestiuo usque ad equinoctium autumnale. Quartum uero annum ab equinoctio autumnali usque ad solstitium hyemale. Karnenses¹⁴⁷ uero reliqui Greci annum suum sex mensibus computabant, et ita illorum annus erat a solstitio hyemali usque ad solstitium aestiuum, sex mensibus. Et alium annum a solstitio aestiuo usque ad solstitium hyemale habebant. Alii autem Greci annum suum proprium computabant dies CCCLIII, hoc enim numero dierum annus lunaris communis¹⁴⁸ constare uidetur. Romani uero, auctore Romulo, X habuisse mensibus annum conprobantur. Qui annus, sicut Macrobius ostendit, incipiebat a mense Marcio et conficiebatur diebus CCC quattuor.

[II.10.7] Δ. Hi ergo X menses in tempore Romuli, in quo numero dierum fuerunt, et que nomina habuerunt?

M. Sic fuerunt nominati: Aprilis, Iunius, Sextilis, September, Nouenber, December, qui trigenarum dierum numero fuerunt quattuor. Uero menses alii sic nominati sunt: Marcus, Maius, Quintilis, October, qui trigenis et singulis diebus fuisse probantur. Hec fuit Romuli ordinatio, qui primum anni mensem genitori suo Marti¹⁴⁹ dedicauit. Marcio autem tenente anni principium, Quintilis et

¹⁴⁷ Possibly corrected from *Karnaenses*.

¹⁴⁸ The correct reading *lunaris communis* is supplied here from *G* (fol. 143r); *S* reads *lunari communi*.

¹⁴⁹ martio *S* ac, marci *G*.

Sextilis a numero dicti sunt, eo quod Quintilis, qui hodie Iulius *dicitur*, quintus mensis *est* a Marcio.

Et ita *September* quasi septimus imber sit a Marcio. Sic *October* octauus, *Nouember* nonus, *December* decimus mensis *est* a Marcio. Alii uero LX dies qui *superfuerunt* super X menses quos diximus sine nomine mensium *fuerunt* apud Romanos in tempore Romuli.

[II.10.8] Δ. Hi ergo X menses quos diximus, in tempore Romuli quod principium habuerunt?

M. Sic habuerunt initium: quomodo mensis lunaris apud Hebreos, hoc *est* quando luna accenditur, tunc erant Kalendę uniuscuiusque mensis apud illos Romanos primum in tempore Romuli. Inde Macrobius di<c>it¹⁵⁰: ‘Romulus cum ingenio acri quidem sed tamen agresti statutum proprii ordinaret imperii, initium cuiusque mensis ex illo sumebat die quo primam lunam contigisset uideri. Et quia non continuo euenit ut eadem die qua nata sit luna semper appareat, sed modo tardius, modo citius, contigit ut, cum tardius appareret, precedenti mensi plurales dies darentur, aut cum celerius, pauciores dies, et singulis quibusque mensibus perpetua numeri lege primus casus addixit. Et sic factum est ut alii menses XXX, alii XXXI die<s> sortirentur.’¹⁵¹ Omnibus tamen mensibus ex die Nonarum VIII dies occurrere placuit, et aliis mensibus IIII Nonas a Kalendis, aliis uero mensibus sexto Nonas a Kalendis occurrere fecit. Postea uero Numa Paphylus cum regnare coepisset apud Romanos addidit duos menses, hoc *est* Ianuarium et Februarium. Inde Macrobius dicit: ‘Secutus Numa Paphylus in regnum, ordinationem anni diligentius inuestigauit quantum sub caelo rudi et saeculo adhuc inpolito solo ingenio magis[69r]tro comprehendi potuit, uel quia Grecorum obseruatione forsitan instructus, L dies addit super alios CCCIIII dies qui antea fuerunt in anno in tempore Romuli, et sic Numa in CCCLIIII dies, quibus

¹⁵⁰ diem S, diei G.

¹⁵¹ Macrobius, *Saturnalia*, I, XV, 5–6 (somewhat re-elaborated).

XII mensibus lunę cursum confici credidit, annum extendit'¹⁵², et duos menses Numa addidit et nominavit, hoc est Ianuarium et Februarium, ad X menses quos ante habuerunt Romani in tempore Romuli, et ita XII menses solares in anno composuit. Et Ianuarium primum anni mensem esse constituit. Secundum uero Februarium dedicauit Februo deo, qui lustrationum potens esse apud eos credebatur. Lustrari enim eo mense ciuitatem Romam faciebant et sacrificia diis manibus, id est diis infernorum solu/bant pagani. Et sic Romani, secundum hanc ordinationem Numę Pamphilii, ad lunę cursum sicut Greci annum proprium computabant. Et XI dies intercalares habebant, sicut sunt epactę in luna. Paulo post, Numa in honorem inparis numeri, sacratum hoc et ante Pitagoram parturiente naturam,¹⁵³ unum adiecit diem quam Ianuario¹⁵⁴ dedit, et sic in anno composuit numerum dierum CCCLV. Alios autem X dies intercalares habuerunt Romani. Nam et Greci cum anni aduerte\re/nt temere se CCCL<II>II¹⁵⁵ diebus ordinasse annum, quoniam apparet de solis cursu, qui CCCLXV¹⁵⁶ diebus et quadrante zodiacum circulum conficit, deesse anno suo XI dies et quadrantem, statuta ratione commentati sunt. Omni¹⁵⁷ autem intercalationi apud Romanos mensis Februarius deputatus est, quoniam his ultimus anni erat mensis, quando a Marcio incipiebat annus, quod etiam ipsum de Grecorum imitatione faciebant. Nam Greci ultimo anni sui mense superfluos interserebant dies. Verum una re Romani a Greci differebant.¹⁵⁸ Nam Greci, confecto ultimo mense, intercalabant; Romani uero, non confecto Februario, sed post uigesimum et tertium diem eius, intercalabant, terminalibus scilicet sacrificiis peractis. Deinde reliquos Februarii

¹⁵² Macrobius, *Saturnalia*, I, XIII, 1–2 (somewhat re-elaborated). All the rest of this section is based, sometimes loosely and sometimes *verbatim*, on *Saturnalia*, I, XIII–XIV.

¹⁵³ *G* (fol. 143v) reads: *sacratum hoc ante pitagoram parturiente natura*. The corresponding passage in Macrobius's *Saturnalia* (I, XIII, 5) actually reads *secretum hoc et ante Pythagoram parturiente natura* in Kaster's edition.

¹⁵⁴ I rely here on the reading of *G*: *ian̄*. *S*, instead, reads *rañ*.

¹⁵⁵ CCCLXII *S*; CCCLXIII *G*. Both figures are wrong. *B*, fol. 30v, presents here the correct figure CCCLIII.

¹⁵⁶ This is the reading of *G*. *S* offers the erroneous figure CCCL.

¹⁵⁷ *omnia S ac, G*.

¹⁵⁸ *deferebant S ac* (same reading also in *B*, fol. 30v).

menses dies, qui erant V, post intercalationem subiungebant. Gaius autem Caesar, cum imperare coepisset, sapientiæ diligentius et rationis curam gerens, cum uidisset istum numerum dierum trecentorum LV cursum solis non implere, X dies intercalares misit in ordinem anni solis, et sic ordinavit annum in XII mensibus: septem menses qui habent XXXI dies et III menses trigenos, et Februarium XXVIII dies habere, et ita annum solare habere dies CCCLXV composuit. Hinc Macrobius dicit: ‘Postea Gaius Caesar omnem hanc inconstantiam temporum uagam adhuc et incertam in ordinem statutę diffinitionis constituit. Imitatus Aegyptios¹⁵⁹, solos¹⁶⁰ diuinarum rerum omnium conscios, ad numerum solis qui diebus CCCLXV et quadrante cursum anni dirigere conficit.’¹⁶¹ Hoc enim numero dierum annus solis colligendus est, quem peragit dum ad signum reuertit de nouo ex quo egressus est. Inde annus uertens uocatur, et habetur magnus cum lunę annus breuis putetur; hinc Virgilius dicit: ‘Interea magnum sol circum uoluitur annum.’¹⁶² Gaius Iulius Caesar X dies qui fuerunt intercalares superadiecit obseruationi ueteri, ut annum CCCLXV diebus quibus sol zodiacum circulum illustrat efficerent. Et ne quadrans deesset, statuit ut quarto quoque anno sacerdotes qui curabant mensibus ac diebus unum intercalarent diem, eo scilicet mense [69v] ac loco quo etiam apud ueteres mensis intercalabatur, id est ante ultimos V dies Februarii mensis, id quod bissextum censuit nominandum. Sic annum ciuilem Caesar, habetis ad limitem constitutum dimensionibus,¹⁶³ edicto palam posito publicauit. Et postea Octavianus Caesar Augustus imperator omnem hunc ordinem totius anni, quem ordinavit antea Gaius Caesar, aereae¹⁶⁴ tabulę incisione scriptę ad ęternam custodiam Romanis mandauit. Duodecim menses unum annum faciunt.

[II.11.1] Δ. Annus quid est?

¹⁵⁹ inmitatus aegyptiis *S ac*.

¹⁶⁰ solis *S ac, G*.

¹⁶¹ Macrobius, *Saturnalia*, I, XIV, 2–3.

¹⁶² Virgil, *Aeneis*, III, 284.

¹⁶³ demensionibus *S ac*, dementionibus *G* (and also *B*, fol. 31r).

¹⁶⁴ *G*; aereeę *S*.

M. *Annus dicitur circuitus.* ‘Hinc Ataius Capito’, ut Macrobius dixit, ‘*annum a circuitu temporis putat esse dictum, quia ueteres an pro circum ponere solebant,*¹⁶⁵ ut in Originibus oratorum dicit: *an terminum, id est circa terminum, et ambire dicitur pro circumire.*’¹⁶⁶ *Annus ergo sic dicitur circuitus, quia in se ipsum per circuitum peruenit.*

[II.11.2] **Δ.** *Annus quomodo diffinitur?*

M. Isidorus diffiniuit dicens: ‘*Annus est circuitus solis ac reditus per XII menses.*’¹⁶⁷ *Annum autem sapientes huius mundi partim ciuilem, partim naturalem, partim magnum dixerunt.*

[II.11.3] **Δ.** *Genera annorum quot sunt?*

M. *Duodecim.* Dicitur enim annus ciuilis, annus naturalis, annus iubeleus, annus bissextilis, annus lustralis, annus olimpiadis, annus quod dicitur era, annus solaris, annus communis, annus embolismus, annus breuis, annus magnus.

[II.11.4] **Δ.** *Annus ciuilis quid est?*

M. Ab Aegyptiis dictus est. Aegyptii enim fecerunt suas ciuitates quadratas, et in muris suarum ciuitatum scripserunt de ratione cursus solis et lunę, quando sol incipit crescere et quando decrescit, et fecerunt signa in illis muris ciuitatum¹⁶⁸ quando solstitium uel æquinodium, hoc est quando incipit dies crescere, uel quando equales sint dies et nox, potuerunt uidere in illis signis quę fecerant. In Egipto enim non est pluuiæ neque nubes ob<s>curat cursus syderum; propter hoc, Egiptii amplius de ratione cursus siderum intelligunt. Iosephus Egiptiis sapientia omnibus differre dicuntur¹⁶⁹, et Romani annum ciuilem constituerunt.

¹⁶⁵ *G*; sobant *S*.

¹⁶⁶ Macrobius, *Saturnalia*, I, XIV, 5.

¹⁶⁷ Isidore, *De natura rerum*, VI.

¹⁶⁸ The words from *scripserunt de ratione cursus* down to *in illis muris ciuitatum* were omitted by the scribe of *G*, surely due to homoeoteleuton (i.e. the double occurrence of the word *ciuitatum* at short distance).

¹⁶⁹ *ducuntur S ac.*

Inde dixit Macrobius: ‘*Annum ciuilem Iulius Caesar certis terminis et dimensionibus constituit.*’¹⁷⁰

[II.11.5] *Annus naturalis est cum soli luna se opponit, ut inter orbem solis et oculos nostros media facta luna tenebras totius mundi efficiat.*

[II.12.1] *Tres menses unum tempus efficiunt, quod tempus uicissitudo triformis nominatur, eo quod unumquodque tempus de quattuor temporibus anni tribus mensibus adimpletur.*

[II.12.2] Δ. Hęc ergo quattuor tempora anni quomodo diffiniuntur?

M. Ita dumtaxat: tempora dicta sunt a *communione temperamento*, quo se inuicem humore, siccitate, calore et frigore temperant. Item Isidorus dixit: ‘Tempora sunt uices *mutationum*, in quibus sol certa cursus sui *dimensione*¹⁷¹ anni orbem inconfusa uarietate distinguit.’¹⁷² Tempora dicta sunt a temperamento quo unumquo\nd/que illorum spatium separatim temperatum sit. Hęc ergo quattuor tempora ita nominantur: uer, estas, autumnus, hiems.

[II.12.3] Δ. Uer unde nomen accepit?

M. Hoc uer *dicitur*, eo quod in eo cuncta uernent, id est [70r] uirescunt de uiriditate, quia in illo tempore tellus uirescit et florere uidetur.

[II.12.4] Δ. Estas unde nomen accepit?

M. Ab estu, hoc est a calore solis maturandis frugibus.

[II.12.5] Δ. Autumnus quid est?

M. Autumnus ab *autumnatione*, id est collectione fructuum. *Augmentum* dicitur ab *augmento* frugum quę in eo colliguntur, siue autumnus abundantia dicitur, uel maturitas.

[II.12.6] Item hiems uel *hemon* grecum nomen est, et interpretatur frigus uel nix. Eadem et bruma dicitur, id est breuis, siue edacitas, eo quod omnia deuorat; unde et brumosi homines dicuntur, id est edaces uel gulosi.

¹⁷⁰ This sentence does not occur in Macrobius’s *Saturnalia* (although cf. I, XIV, 13).

¹⁷¹ *demensione* *S ac, G.*

¹⁷² Isidore, *De natura rerum*, 7.

[II.12.7] Ver ergo incipit, ut quidam dicunt¹⁷³, ab VIII Kalendas Marcii, permanens dies XCI, *id est* usque ad VIII Kalendas Iunii. Aestas incipit VIII Kalendas Iunii, diebus XCI usque ad¹⁷⁴ X Kalendas Septembris.¹⁷⁵ Autumnus incipit X Kalendas Septembris¹⁷⁶ usque in nono Kalendas Decembris, diebus XC duobus. Hiems inchoat a VIII Kalendas Decembris usque in VIII Kalendas Marcii, diebus XCI.¹⁷⁷ Augustinus tamen et Romani necnon et Greci hiemis uidelicet initia occasu uergiliarum VII Idus Nouembris, aestatis ortu eorundem VII Idus Maii. Item ueris et autumnus, cum Pliades medio fere die uel nocte oriuntur et occidunt. Plinius Secundus primo libro Naturalis Hystorię eadem tempora distinguenda ita iudicauit. Sic etiam et in libris chosmographorum authenticis ac nobilissimis¹⁷⁸ eadem tempora inchoanda reperimus.¹⁷⁹ Uer incipit a VII Idus Februarii usque ad VIII Idus Maii. Aestas a septimo Idus Maii usque VIII Idus augustas. Autumnus a VII Idus Augusti usque in VIII Idus Nouembris. Tempus autem hiemis a VII Idus Nouembris incipit, usque in VIII Idus Februarii. Hęc autem quattuor tempora anni quę prædiximus, ita inchoari debent *secundum* Anatholium, ut illa quattuor confinia temporum, hoc est duo æquinoclia et duo sol/e/stitia, in medio quattuor temporum stare uide\a/ntur. Inde Anatholius dixit: ‘Hoc autem non ignores¹⁸⁰, quod ista quattuor quę prediximus temporum¹⁸¹ confinia, licet mensium sequentium Kalendis adproximantur, unumquodque tamen dimidium temporis, id est uerni et aestatis, autumnus et hiemis, teneat, et non exinde temporum principia inchoantur unde mensium Kalendę initiantur, sed

¹⁷³ uer ergo Inde incipit alii dicunt S.

¹⁷⁴ The preposition *ad* is omitted in S and is here supplied from G.

¹⁷⁵ The correct reading is here supplied from G, while S offers the plainly erroneous reading *Februarii*.

¹⁷⁶ Again, the correct reading is here supplied from G.

¹⁷⁷ The data for Autumn and Winter differ from what is indicated by Isidore in his *De natura rerum*, 7.5: according to Isidore, Autumn lasts 93 days, rather than 92; moreover, according to Isidore, Winter begins on the 7th calends of December, not on the 9th, and the duration of this season is said to be 90 days, not 91.

¹⁷⁸ nobilis si mis S.

¹⁷⁹ A word was erased after *reperimus*, possibly *dixit*.

¹⁸⁰ ignoras S ac, G.

¹⁸¹ G; tempora S.

ita unumquodque tempus inchoatur, ut a prima die ueris tempus æquinoctium diuidat¹⁸², hoc est XLV dies ante et XLV post; et ita aestatis tempus solesitium hiemale diuidat; et sic autumnus tempus æquinoctium; simili modo et hiemis tempus, solstitium diuidat, siue secundum Grecos æquinoctia et solstitia facias, siue secundum Latinos. Sic unumquodque tempus inchoandum est ut in medio habeat æquinoctium siue solesitium. Et hæc quattuor tempora quæ diximus unum annum efficiunt.¹⁸³

[II.11.1 bis] Δ. Annus quid est?¹⁸⁴

M. Annus dicitur circuitus. Hinc Ataius Capito, ut Macrobius dixit, annum a circuitu temporis putat esse dictum, quia ueteres an pro circum ponere solebant, ut in Originibus oratorum dicit: an terminum id est circa terminum, et ambire dicitur pro cir[70v]cumire. Annus ergo sic dicitur circuitus, quia in se ipsum per circuitum peruenit.

[II.11.2 bis] Δ. Annus quomodo diffinitur?

M. Isidorus diffiniuit dicens: annus est circuitus solis ac reditus per XII menses. Annum autem sapientes huius mundi partim ciuilem, partim naturalem, partim¹⁸⁵ magnum dixerunt.

[II.11.3 bis] Δ. Genera annorum quot sunt?

¹⁸² Anatolius Latinus, *De ratione paschali*, §14.

¹⁸³ Much of section II.12.7 is a re-elaboration of Bede, *De temporum ratione*, XXXV (esp. 46–63), and is therefore probably interpolated (indeed, consider that the whole section on the seasons does not occur at all in the *B* copy of *DDT*; cf. Appendix I, fn. 196 below).

¹⁸⁴ A cross drawn in the exterior margin beside this question corresponds to another similar cross drawn in the exterior margin of fol. 70va, beside the words *tenebras totius mundi efficiat* (see below). These two crosses indicate that the whole section from *Annus quid est?* down to *tenebras totius mundi efficiat* is an erroneous repetition of (nearly) identical materials copied at fol. 69v (although note that the sentence *Iosephus Egyptiis sapientia omnibus differre dicuntur*, copied the first time round, is absent in the repeated section). An analogous repetition of the materials on the year can be found in *G* at fol. 145r (where, however, the answer to the question *Annus quid est?* begins with the misplaced sentence *Iosephus Aegyptii sapientia omnibus differre ducuntur*, i.e. precisely the sentence which the repeated section of *S* lacks). The occurrence of this remarkable duplication in both *G* and *S* points to the presence of a textual corruption already in the common archetype on which both witnesses ultimately depended. Significantly, there is no trace of this repetition in *B*, fols 32v–31r.

¹⁸⁵ The three repetitions of the word *partim* are readings *pc*; the reading *ac* is, in each case, *partem*, which is also the reading of *G*.

M. Duodecim. Dicitur enim annus ciuilis, annus naturalis, annus iubeleus, annus bissextilis, annus lustralis, annus olympiadis, annus quod dicitur era, annus solaris, annus communis, annus embolismus, annus breuis, annus magnus.

[II.11.4 bis] **Δ.** Annus¹⁸⁶ ciuilis quid est?

M. Ab Egyptiis¹⁸⁷ dictus est. Aegyptii enim fecerunt suas ciuitates quadratas, et in muris suarum ciuitatum scripserunt de ratione cursu solis et lunę, quando sol incipit crescere et quando decrescit, et fecerunt signa in illis muris ciuitatum quando sol/e/stitium uel equinoctium, hoc est quando incipit dies crescere uel quando aequales sint dies et nox potuerunt uidere in illis signis quę fecerant. In Egypto enim non est pluuiā neque nub/e/s obscurat¹⁸⁸ cursus syderum; propter hoc Aegyptii amplius de ratione cursus siderum intelligunt. Et Romani annum ciuilem constituerunt, inde dixit Macrobius: annum ciuilem Iulius Caesar certis terminis et dimensionibus¹⁸⁹ constituit.

[II.11.5 bis] Annus naturalis est cum soli luna se opponit, ut inter orbem solis et oculos nostros media facta luna tenebras totius mundi efficiat¹⁹⁰.

[II.11.additum] ¹⁹¹Indictiones autem Romani primum constituerunt in tempore Caesaris Augusti imperatoris, sicut in euangelio legitur: exiit edictum, hoc est imperatum, a Cesare Augusto, ut censum profiterentur uniuersi per orbem terrę, et has indictiones mutant Romani in VIII Kalendas Octobris, siue etiam in Kalendis Ianuarii.¹⁹² Indictiones XV annorum circuitu in suo semper uestigia redeunt, quas antiqua Romanorum industria ad cauendum errorem qui de temporibus imperatorum forte oriri poterat institutas conperimus. Dum enim uerbigratia quilibet¹⁹³ imperator medio anni tempore uita uel regno decedere poterat euenire, ut eundem

¹⁸⁶ G; annis S.

¹⁸⁷ A letter has been erased between the two i of the ending -iis. Indee, here G (fol. 145r) reads *ab aegyptius*.

¹⁸⁸ obscuret S ac.

¹⁸⁹ demensionibus S ac; demensibus G.

¹⁹⁰ efficiet S ac.

¹⁹¹ For the meaning of the cross drawn in the exterior margin here, see Appendix I, fn. 184 above.

¹⁹² G; iunr S.

¹⁹³ quelibet S ac; quibet G.

annum unus historicus eius regis asscriberet temporibus, eo quod eius anni parte regnaret, alter uero historicus eundem successori illius potius additulandum putabat, eo quod et hic partem eque eius haberet in regno. Verum ne per huiusmodi dissonantiam temporis error inolesceret, statuerunt indictiones, quibus uterque scriptor, immo etiam uulgus omne, temporum cursum facillime conseruaret. Quas pro facilitate quoque calculandi XV esse uoluerunt, ut planissimo numero, et ad multiplicandum promptissimo, compendiosius transacti temporis status in memoriam posset reduci. Quidam autem putant indictiones ideo dici eo quod quondam in re publica, post censum quinto anno peracto, urbs Roma lustrabatur, et propter indiculum terne lustrationis et census indictiones esse conditas dicunt.¹⁹⁴

[II.11.5 (*continued*)] Quod dicitur eclipsis solis, et¹⁹⁵ hoc contingit quando luna accenditur.¹⁹⁶

[II.11.6] Annus iubeleus est annus remissionis qui [71r] VII annorum ebdomadibus constat. Et unaquaque ebdomada habet VII annos in se secundum Hebreos, et sic in VII ebdomadibus XLVIII anni sunt. Uno autem addito anno, L anni fiunt, in quo iuxta legem tuba clangebant, et ad omnes reuertebatur antiqua possessio, et serui in libertatem ex precepto domini dimittebantur.

[II.11.7] Annus bissextilis est in quo, uno die addito ex quattuor quadrantibus, fiunt dies CCCLXVI.

[II.11.8] Annus lustralis apud Romanos V annorum circulo peruenit. Lustrum enim quinquennii tempus est, sicut in Esaia legitur: VIII et per tria lustra, hoc est per ter V annos. Dictum autem lustrum quod census per quinquennium in re

¹⁹⁴ This whole section about the institution of the indiction cycle is a re-elaboration of Bede, *DTR*, 48. It is therefore plainly an interpolation which does not belong to the original *DDT*. This interpolation may be due to the erroneous incorporation of *marginalia* (referring perhaps to the brief mention of the indiction in the section concerning the *era*, for which see below), as shown by the fact that the section concerning the indictions breaks in two the discussion of solar eclipses. Although neither *S* nor *G* present any signs indicating that their copyists understood the origin of this passage, in this edition I have marked off the section about the indictions by printing it in smaller size as an independent paragraph.

¹⁹⁵ *G*; ex *S*.

¹⁹⁶ This sentence clearly continues the discussion of eclipses that precedes the account of the seasons (II.12.1–7) as well as the interpolated section concerning the indiction (II.11 *additum*). Note that in *B*, fol. 31v, the discussion of eclipses constitutes an uninterrupted flow, and there is no trace in that manuscript of either the section about the seasons or the one about the indictions.

publica agebatur. Deinde post *peractum cenum*, sacrificio facto, urbs Roma lustrabatur, hoc est inluminabatur, quia circuibant totam ciuitatem cum lucernis in honorem deorum suorum.

[II.11.9] Annus olimphyadis, apud Grecos ab¹⁹⁷ Olimpho agone dictus, transactis IIII annis, in fine quarti anni agonis tempus agebatur; hoc tempore mittebant Greci *per* ciuitates nuntios, admonituri ut non solum de ciuitatibus *propinquis per circuitum*, sed etiam *omni* gente *omnique* etate et ab *omni* sexu, conuenirent ad agonem publicum.

[II.11.9] ¹⁹⁸Annus *qu\i*/¹⁹⁹ dicitur aera apud Romanos quinquennii tempus est, inde Isidorus dicit: ‘Aera singulorum annorum constituta a Caesare Augusto, quando primum cenum exegit et orbem descripsit.’²⁰⁰ Aera Cesaris Augusti tempore posita est, et illud aera quinquennii tempus. Dictum autem aera, eo quod omnis orbis aes reddere professus est rei publicę: per V annos argentum et per alios V aurum, per alios V aes reddebant. Sed tamen qui aurum non poterant habere nec reddere donabant argentum, et qui non habebant argentum soluebant aes. Deinde ter V annis transactis, id est XV annis, indictio plena dicebatur, hoc est aedictio²⁰¹ perfecta.

[II.11.10] Annus solaris est cum ad eadem loca siderum sol redit ex quibus egressus est, *peractis* CCCLXV diebus et VI horis; hoc enim dierum numero sol zodiacum circulum circuitu consummat.²⁰² Et hic annus solaris quem diximus magnus dicitur in comparatione anni lunaris, quia annus lunaris dicitur etiam unus mensis, quia quod sol percurrit in CCCLXV diebus, luna currit in uno mense lunari. Inde Macrobius dicit: ‘Annus solaris magnus habetur cum luna annis’²⁰³

¹⁹⁷ G; ad S.

¹⁹⁸ There is here a large asterisk-shaped sign in the intercolumnar space, but its meaning is unclear to me.

¹⁹⁹ quod S ac, G.

²⁰⁰ Isidore, *Etymologiae*, V, XXXVI, 4.

²⁰¹ G; dictio S.

²⁰² consummit S ac, consumit G.

²⁰³ annus G.

brevis putatur.’²⁰⁴ *Nam* lunaris annus mensis est, quia luna paulo minus quam mensem cursum suum consummare uidetur. Inde Isidorus dicit: ‘Luna uicinior est terris quam sol, inde breuiore orbe celerius peragit cursum suum. Nam iter quod in diebus CCCLXV et quadrante²⁰⁵ sol peragit, luna currit per XXX dies, unde et antiqui menses in luna, annum in solis cursu posuerunt.’²⁰⁶

[II.11.11] *Communis* autem annus XII lunares menses colligit, CCCLIII dies efficiens. *Embolismus* autem annus et lunas XIII et dies CCCLXXXIII habere monstratur. *Communes* autem anni ideo dicuntur quia simul duo anni lunares equales dierum numero currunt. *Embolismus* uero [71v] habundans annus dicitur, quia unam lunationem, hoc est XXX dies, plus habere uidetur quam annus communis. De anno autem solis maior est XVIII diebus. Item annus solis exsuperat annum communem lunarem XI diebus. Inde Dyonisius dicit: ‘*Embolismorum* autem ista ratio probatur existere, ut annorum communium uideatur²⁰⁷ damna supplere, quatenus ad solare tempus lunaris exsequatur²⁰⁸ excursio. Quamuis enim solis annuum cyclum per singulos menses luna circumeat, tamen huius perfectionem XII mensibus suis implere non preualet. Denique in annis communibus ad rationem solaris anni XI dies lunę deesse cernuntur. In embolismis uero XVIII diebus eundem annum solarem uidetur luna transcendere.’²⁰⁹

[II.11.α] Δ. Ista ergo ratio communium annorum et embolismorum, unde primum processit scire nos debemus.

²⁰⁴ Cf. Macrobius, *Saturnalia*, I, XIV, 4 (actually reading *annus* [...] *habetur magnus, cum lunae annus brevis putetur*).

²⁰⁵ quadrantes *G*.

²⁰⁶ Isidore, *Etymologiae*, III, LVII, 1 (in Lindsay’s edition the duration of the year is *diebus trecentis sexaginta quinque*, with no mention of the additional *quadrans*, i.e. the quarter-day exceeding the duration of 365 days).

²⁰⁷ uidetur *G*.

²⁰⁸ exsequitur *S ac*; exsequetur *G*.

²⁰⁹ Dionysius Exiguus, *Epistola ad Bonifatium et Bonum (Epistola Dionysii)* (ed. Krusch, p. 83, ll. 10–16 = *PL* 67, col. 514C).

M. Antiqua traditio fuit ab Hebræis enim, et a Moyse primum processit, cui *Deus* præcepit²¹⁰ ut pascha faceret populus Dei XIII luna primi mensis, anni principio: ‘pascha enim’, ut ait Uictorius, ‘anni principio, non fine, celebratur.’²¹¹ Et numquam Hebrei celebrabant pascha ante æquinoctium, sed aut in æquinoctio, si quartadecima luna fuisset, aut post æquinoctium. Et si communis annus fuisset, post XII menses peractos, postea pascha celebrabant. Si autem embolismus annus esset, post XIII menses pascha eorum celebrabatur; inde *Sanctus* Cyrillus episcopus dixit: ‘Debemus autem inuestigare epactas lunares in mensibus totius anni, ut celebremus pascha in luna primi mensis, in principio anni post ueris exordium’²¹², hoc est post æquinoctium, qui est XII *Kalendas* Aprilis. Tunc enim finit sol cursum totius anni, et numerum XII tantum lunas, iuxta supputationem legalem Hebræorum, in anno communi secundum supputationem dierum, hoc est CCCLIII si fuerit communis annus; si autem embolismus XIII lunas et CCCLXXXIII dies habere monstratur. Isti ergo communes anni et embolismi per cyclum X et VIII annorum discurrunt, qui cyclus apud Grecos enniakaidecateretha²¹³ uocatur, quod interpretatur decemnouenalis. Et iste cyclus duo nomina habet apud Grecos, hoc est ogdoas et endecas. Ogdoas autem in greco, VIII in latino sermone sonat, et endecas uero XI interpretatur. Et sic VIII et XI simul fiunt XVIII, qui dicuntur termini paschales, hoc est Nonae Aprilis, VIII *Kalendas* Aprilis, et cetera.

[II.11.β] **Δ.** Quis primus nominauit istos terminos paschales scire nos oportet.

M.²¹⁴ Isti termini paschales fuerunt obseruati in ueteri lege secundum rationem communium et embolisimorum, sed non fuerunt nominati illo uocabulo quomodo nominantur apud *Christianos*. Angelus enim Domini hos terminos

²¹⁰ præcepit in ext. marg.

²¹¹ Victorius of Aquitaine, *Cursus paschalis* (*Prologus Victorii*) (ed. Mommsen, p. 683, l. 4–5 = ed. Krusch, p. 24, ll. 15–16).

²¹² *Epistola Cyrilli* (ed. Krusch, p. 346, §4).

²¹³ enniakaidacateretha *G*.

²¹⁴ The abbreviation for *magister* is here written *Ō–C* in *S*, while in *G* the tag is missing altogether.

paschales primum ad Pachomium monachum in Egypto ex reuelatione Domini monstrauit *per* litteras quasdam, unde Cyrillus episcopus dixit: ‘Indicabo uobis quod Pachomius, monachus insignis factus apostolice gratiē egre[72r]giusque fundator Aegypti cēnobiorum, edidit ad monasterium quod lingua aegyptia uocatur Pabum: litteras quas angelo dictante perceperat, ut non in errorem incurrerent Cristiani in sollempnitatis paschalis ratione, scirentque lunam primi mensis in anno communi et embolesimi.’²¹⁵ Hunc ergo cyclum decemnouenalem, hoc est terminos paschales, qui *per* VIII et X annos cum ratione communium et embolesimorum obseruatione discurrit, illi sancti patres, qui in Niceno concilio fuerunt, cristiana obseruatione tradiderunt obseruandum. Inde Dyonisius dicit ad papam Leonem: ‘Uenerabiles trecenteni XVIII pontifices, qui apud Niceam ciuitatem Bythinię contra uesaniam Arrii heretici conuenerunt, quartas decimas lunas paschalis²¹⁶ obseruantię *per* XVIII annorum cyclum semper stabiles inmotasque fixerunt, quę cunctis saeculis eodem quo repetuntur exordio sine uarietatis excursu labuntur. Hanc autem regulam p̄fati circuli, non tam peritia sęculari quam Sancti Spiritus illustratione sanxerunt, et ueluti anchoram firmam ac stabilem huic rationi lunaris dimensionis²¹⁷ obposuisse cernuntur’²¹⁸, et Theophilus et Cyrillus ab hac sinodi reuerendę constitutione minime dissentiunt. Immo potius, eundem decemnouenalem cyclum qui enniakaidecadereda greco uocabulo nuncupatur sollicite retinentes, paschalem cursum nullis diuersitatibus interpellasse monstrantur, et sancti concilii traditionem ad obseruandas quartas decimas lunas paschales *per* omnia tradiderunt. De hoc etiam cyclo decemnouenali qui *per* communes et embolismos discurrit, Bonus, sanctus primicerius notariorum, ad Iohannem papam de ratione paschali scribens, inter cętera dixit: ‘Suggero igitur apostolatui uestro beatissimos patres in Niceno

²¹⁵ *Epistola Cyrilli* (ed. Krusch, p. 346–7, §5).

²¹⁶ *G*; paschales *S*.

²¹⁷ demensionis *S* ac, *G*.

²¹⁸ Dionysius Exiguus, *Epistola ad Petronium* (*Prologus Dionysii*) (ed. Krusch, p. 63, ll. 4–12 = *PL* 67, col. 485A).

concilio decemnouenalem cyclum, quem Greci enniaka ΔεκαΤΕΡΕΤΑ²¹⁹ uocant, unanimiter adprobasse, qui sui circuli euolutione continua *quartas decimas* paschales lunas *per omnia tempora usque in finem saeculi* sine ullo errore demonstraerunt.²²⁰ De hoc itaque cyclo decemnouenali, et de communibus et embolismis, Dyonisius ita commemorat dicens: ‘Nouerimus itaque quia idem decemnouenalis circulus *per ogdoadem* et endecadem semper in se reuoluitur. Octo namque et XI ipse numerus explicatur. Ogdoas ergo, qui incipit a primo decemnouennali cyclo, qui est lunaris septimus decimus, \h/ac ratione peragitur, ut annum primum et secundum communes, id est minores, habeat, tertium annum embolismum, id est maiorem, quartum et quintum communes, sextum embolismum, septimum communem, octauum embolismum. Ac per hoc ogdoadis²²¹ communes anni V et III embolismi asscribuntur. Item endegas hac lege decurrit: incipit a nono cycli decemnouennalis anno, qui est lunaris sextus, cuius primus et secundus annus [72v] communes, tercius embolismus, quartus et quintus communes, sextus embolismus, septimus et octauus communes, nonus embolismus, decimus communis, undecimus embolismus. Sicque enim comunibus annis VII, embolismis IIII, terminatur²²²; et sic in cyclo decemnouennali XII communes²²³ anni sunt, et VII embolismi.

[II.11.γ] Δ. Interrogandum est: in hoc cyclo decemnouennali, quot menses lunares sunt?

M. Id est CCXXXV.

[II.11.δ] Δ. Et quot dies sunt in his CCXXXV mensibus lunaribus scire nos oportet.

²¹⁹ The word is here written by alternating Latin and Greek letters.

²²⁰ *Exemplum suggestionis Bonifati Primiceri Notariorum ad Iohannem Papam de ratione paschali* (ed. Krusch, p. 56).

²²¹ The reading *hoc ogdoadis* is supplied from *G* (fol. 147r), as the microfilm of *S* available to me is illegible here.

²²² Dionysius Exiguus, *Epistola ad Bonifatium et Bonum (Epistola Dionysii)* (ed. Krusch, p. 82–3 = *PL* 67, cols 513D–514B).

²²³ *communi S ac.*

M. Hoc est VI milia DCCCCXXV²²⁴ dies sunt.

[II.11.ε] **Δ.** \Item/ interrogandum est et diligentius inuestigandum: in hoc cyclo decemnouennali, quomodo est concordia inter solem et lunam in numero dierum?

M. Dixit enim Dyonisius quod annus solis maior sit XI diebus anno communi, et quod annus embolismus maior sit anno solis XVIII diebus.²²⁵ Colligamus ergo illas epactas, hoc est XII dies qui sunt plus in anno solis, per XVIII annos. Quantus numerus de hac collectione colligitur et embolismos VII colligamus in unum. Sic ergo colligendi sunt illi XI dies solares per XVIII annos, bis XI XXII, XI ter XXXIII, quater ducti XI XLIII,²²⁶ quinquies multiplicati XI LV²²⁷, et sic per ordinem currit illa collectio: LXVI LXXVII²²⁸ LXXXVIII XCVIII CX CXXI CXXXII CXLIII CLIII CLXV CLXXVI CLXXXVII CXCVIII CCVIII. Ista est collectio et congregatio dierum omnium qui sunt amplius in annis solaribus plus quam in annis communibus per XVIII annos. Colligamus ergo embolismos VII in I, et uideamus quotus numerus inde colligitur. Unus embolismus mensis XXX dies habet, in duobus embolismis LX, in quattuor CXX, in sex CLXXX, in VII autem embolismis CCX dies sunt. Et sic ergo inuenitur unus dies plus in cyclo lunari XVIII annorum quam in cyclo solari. Qui unus dies superfluous saltus dicitur, qui praeparatur et crescit per XVIII annos. A XV itaque luna paschali presentis anni cuiuslibet, siue communis sit siue embolismus, usque ad quartam decimam lunam, hoc est ad terminum paschalem, siue communis annus siue embolismus, computandi sunt. Et si communis fuerit, post XII menses peractos pascha celebratur; si autem embolismus fuerit, post XIII menses, hoc est post CCCLXXXIII dies in primo mense in principio anni, pascha celebratur. Hinc Dyonisius dicit: ‘A XV luna

²²⁴ VI milia DCCCCXXV *G*. Both figures (6925 and 6935) are wrong; the correct tally of 6936 lunar days can be found in *B*, fol. 33v (for the rationale behind this figure, see A. Mosshammer, *The Easter Computus and the Origins of the Christian Era* (Oxford, 2008), 205).

²²⁵ Cf. Dionysius Exiguus, *Epistola ad Bonifatium et Bonum* (*Epistola Dionysii*) (ed. Krusch, p. 83, ll. 14–16 = *PL* 67, col. 514C).

²²⁶ *G* (fol. 147r) gives the erroneous figure XLIII.

²²⁷ quinquies multiplicati XI LV in *inf. marg.*

²²⁸ *G*; LXXVIII *S*. All the other figures of this series are correct in *S*, while the series of *G* contains several mistakes.

paschalis festi anni uerbigratia praecedentis, usque ad XIII sequentis²²⁹, si communis annus est CCCLIII dies habet; si embolismus, CCCLXXXIII. Quod si unus dies plus minusue contigerit, euidens error est, excepto uidelicet primo anno sepe dicti decemnouennalis cycli, quem a quarta decima luna pasche ultimi, id est XVIII anni, usque ad XIII eiusdem primi numerari curamus. Propter quod idem ultimus annus epactas, id est additiones²³⁰ lunares, XVIII tunc retinens, primo anno non XI, ut in ceteris annis fieri solet, sed XII accommodat. Et quia XXX dierum fine uoluuntur, nulla epacta in principio ipsius sic inponitur. Secundus autem annus epactas XI suscipit.²³¹

[II.11.ζ] Δ. Quae est differentia inter decemnouennalem cyclum et lunarem legentibus scire conuenit. Scimus enim [73r] quod uterque cyclus in luna currit, et uterque cyclus X et VIII annos habet.

[M.]²³² Ista differentia est: cyclus decemnouennalis diebus solis uariatur. Id est, per XVIII dies, qui dicuntur termini paschales, per XVIII²³³ annos in se ipsum reuoluitur eadem semper luna, id est XIII. Cyclus autem lunaris unum diem mensis obseruat, sed in epactis uariatur. Decem enim et VIII epactae lunares in una die solis discurrunt, hoc est in Kalendis Ianuarii²³⁴ in principio anni apud Romanos.

[II.11.η] Δ. Deinde nos oportet interrogare qui sunt qui constituerunt istum cyclum lunarem, aut in quo tempore inuentus est.

M. Quod ita soluendum est: lune circulus apud Romanos inuentus est, trigesimo anno ante natiuitatem²³⁵ Christi, hoc est in primo anno regni Herodis, filii

²²⁹ After *sequentis* the rest of the line was left blank, and the text continues with an enlarged *SI* at the beginning of the next line.

²³⁰ additiones *S ac*.

²³¹ Dionysius Exiguus, *Epistola ad Bonifatium et Bonum (Epistola Dionysii)* (ed. Krusch, p. 84, ll. 5–14 = *PL* 67, cols 516A–517A).

²³² The abbreviation for *magister* is here written as a suprascript *Ḡ*–*C*. No *magister*-tag at all occurs here in *G*.

²³³ per VIII *G*.

²³⁴ *G*; iun̄ *S*.

²³⁵ *G*; nauitatem *S*.

Antipatris Ascalonitici. Qui Herodes primus de gentibus regnum Iudæorum conquisiuit ab Augusto imperatore per munera, et regnavit annis XXXVII. Iste ergo cyclus lunaris anno *undecimo* imperii Cesaris Augusti inuentus est. Lunaris enim circulus *proprie* Romanorum est, et ad mensem ianuarium pertingens.²³⁶ Huius autem decemnouennalis cycli *per communes* et embolismos, ut scias in qua die mensis *secundum solem* unusquisque annus siue *communis* siue embolismus sit, et ubi *terminatur*, et quotus est cycli lunaris annus, Dionisius, enucleata formula, subiecta descriptione pandit.

[II.11.0] DE CYCLO DECENNOVENALI ET LUNARI²³⁷

Anno decemnouennali primo, lunari *septimo decimo*, a *quinto decimo Kalendas Maii* usque ad *Nonas Aprilis*; quia *communis annus est*, fiunt dies CCCLIII.

Decemnouennali II, lunari XVIII, ab VIII *Idus Aprilis* usque ad VIII *Kalendas Aprilis*; quia *communis annus est*, fiunt dies CCCLIII.

Decemnouennali III, lunari XVIII, a *septimo Kalendas Aprilis* usque in *Idus \Aprilis/*; quia *embolismus \est/*, fiunt dies CCCLXXXIII.

Decemnouennali IIII, lunari I, ab XVIII *Kalendas Maii* usque in IIII *Nonas Aprilis*; quia *comunis est*, fiunt dies CCCLIII.

Decemnouennali V, lunari II, a III *Nonas Aprilis* usque in XI *Kalendas Aprilis*; quia *communis est*, fiunt dies CCCLIII.

Decemnouennali VI, lunari III, a X *Kalendas Aprilis* usque in IIII *Idus Aprilis*; quia *embolismus est*, fiunt dies CCCLXXXIII.

Decemnouennali VII, lunari IIII, á III *Idus Aprilis* usque in III *Kalendas Aprilis*; quia *communis est*, fiunt dies CCCLIII.

Decemnouennali VIII, lunari V, á II *Kalendas Aprilis* usque in XIII *Kalendas Mai*; quia *embolismus est*, fiut dies CCCLXXXIII.

²³⁶ ad mensem ianuarium pertingens G; ad mensem pertingens S.

²³⁷ The list of calendrical data that follows is written in a somewhat smaller hand. The list is based on Dionysius Exiguus, *Epistola ad Bonifatium et Bonum (Epistola Dionysii)* (ed. Krusch, pp. 85–6 = PL 67, cols 518–20). The title *De cyclo decennovenali et lunari* does not occur in G, but it can be found in B, fol. 34v.

Decemnouennali VIII, lunari VI, á XIII²³⁸ *Kalendas Mai usque in VII Idus Aprilis; quia communis est, fiunt dies CCCLIII.*

Decemnouennali X, lunari VII, á VI *Idus Aprilis usque in VI Kalendas Aprilis; quia communis est, fiunt dies CCCLIII.*

Decemnouennali XI, lunari VIII, á V *Kalendas Aprilis usque in XVII Kalendas Mai; quia embolismus est, fiunt dies CCCLXXXIII.*

Decemnouennali XII, lunari VIII, á XVI *Kalendas Mai usque in I²³⁹ Nonas Aprilis; quia communis est, fiunt dies CCCLIII.*

Decemnouennali XIII, lunari X, á *Nonis Aprilis usque in VIII Kalendas Aprilis; quia communis est, fiunt dies CCCLIII.*

Decemnouennali XIII, lunari XI, á VIII *Kalendas Aprilis usque in II Idus Aprilis; quia embolismus est, fiunt dies CCCLXXXIII.*

Decemnouennali XV, lunari XII, á *Idibus Aprilis usque in Kalendas Aprilis; quia communis est, fiunt dies CCCLIII.*

Decemnouennali XVI, lunari XIII, á IIII *Nonas Aprilis usque in XII Kalendas Aprilis; quia communis est, fiunt dies CCCLIII.*

Decemnouennali XVII, lunari XIII, á XI *Kalendas Aprilis usque in V Idus Aprilis; quia embolismus est, fiunt dies CCCLXXXIII.*

Decemnouennali XVIII, lunari XV, á IIII *Idus Aprilis usque in IIII Kalendas Aprilis; quia communis est, fiunt dies CCCLIII.*

Decemnouennali XVIII, lunari XVI, á III *Kalendas Aprilis usque in XV Kalendas Mai; quia embolismus est, fiunt dies CCCLXXXIII.*

Dionisius huc usque.

²³⁸ *Sic*, instead of the correct datum *XIII*. Same erroneous reading (*XIII*) in *G*.

²³⁹ *Sic*, instead of correct *II*. Same erroneous reading (*I*) in *G*.

[II.13] <M.>²⁴⁰ *Aetas aliquando pro VII annis dicitur, sicut dicuntur VI aetates unius hominis, aliquando etas L anni*²⁴¹, *aliquando tempus uite hominis a natiuitate sua usque ad mortem, aliquando pro VI milibus VI etates dicuntur. Prima etas ab Adam usque ad diluuium, secunda etas a diluuiio usque ad Abraham, tertia ab Abraham usque ad Dauid, quarta a Dauid [73v] usque ad transmigrationem Babylonis, quinta a transmigratione Babylonis usque ad Christum, sexta a Christo usque ad iuditium. Unde Isidorus dicit: ‘Sexta etas que nunc agitur usquequo mundus finiatur’*²⁴²; ‘*residuum sextae aetatis tempus Deo soli est cognitum.*’²⁴³ *Aetas ergo dicitur etiam totum tempus uite presentis ab initio usque ad finem. Inde Isidorus dicit: ‘Aetas perpetua est, cuius neque initium neque extremum noscitur’*²⁴⁴.²⁴⁵ Item alia diffinitio: ‘*Aetas est quod de multis saeculis instruitur, et dicta etas quasi æuitas, hoc est similitudo aeui; nam aeus dictus est greco uocabulo eonas, quod apud Grecos aliquando pro seculo, aliquando pro aeterno ponitur.*’²⁴⁶

[II.14] <Δ.> *Saeculum quid est?*

<M.> *Nomen compositum, hoc est ab illo nomine quod est VI, et ab alio nomine quod est cultus. Inde saeculum dicitur a seno cultu, quia per sex etates mundi uita humana colitur. Saeculum autem uocatur totum presens tempus, et saeculum \a/²⁴⁷ sequendo dicitur, eo quod in tribus temporibus presentis saeculi quæ*

²⁴⁰ The section concerning the *aetas* begins with an enlarged capital *A*, and the dialogue tags for *Magister* and *Discipulus* are completely absent in the last three sections of *DDT* (*aetas*, *saeculum*, *mundus*). Moreover, we would have expected here a question such as *Δ. Aetas quid est?*, but there is no trace of such a question in either *S* or *G*. In *B*, fol. 35r, this section opens with the rubricated title *De aetate quomodo uariae in scriptura nominatur*.

²⁴¹ The reading *aliquando etas L anni* was omitted in *S* and is here supplied from *B*, fol. 35r. *G* reads *aetas L anni*.

²⁴² Isidore, *Etymologiae*, V, XXXVIII, 5.

²⁴³ Isidore, *Etymologiae*, V, XXXIX, 42.

²⁴⁴ *G*; nascitur *S*.

²⁴⁵ Isidore, *Etymologiae*, V, XXXVIII, 4.

²⁴⁶ Isidore, *Etymologiae*, V, XXXVIII, 3–4.

²⁴⁷ The preposition *a* is omitted in both *G* and *B* (fol. 35v).

dicuntur presens, preteritum et futurum, unumquodque²⁴⁸ tempus de his aliud/
sequitur ut presens preteritum et futurum, presens sequitur.²⁴⁹ Inde Isidorus dicit:
‘Sæcula dicta sunt eo quod sequantur²⁵⁰; abeuntibus enim aliis seculis, alia
succedunt.’²⁵¹

[II.15.1] <A.> *Mundus unde dictus est?*

<M.> Duobus modis, a munditia siue a motu.

[II.15.2] <A.> *Quare ergo mundus a munditia dicitur?*

<M.> Augustinus ostendit dicens: ‘Mundus a munditia nomen accepit, quia
unaquæque res et unaquæque creatura, in principio Domini²⁵² praecepto creata
et ab aliis segregata²⁵³, ad mundum apparuit, hoc est aperta et clara.’²⁵⁴ Siue
mundus, sicut Isidorus ostendit, a motu dicitur, quia mundi elementa semper in
motu sunt, ut caelum et aer et sol et luna et omnia sidera et mare et flumina et

²⁴⁸ The reading *unumquodque* is here supplied from *B* (fol. 35v); *S* reads *unde quodque* and *G* *unquodque*.

²⁴⁹ *B* reads *sequitur praesens*.

²⁵⁰ *B* reads *se sequantur*, while *G* simply reads *sequatur*.

²⁵¹ Cf. Isidore, *Etymologiae*, V, XXXVIII, 1.

²⁵² *B* reads *in principio uerbi Domini*.

²⁵³ *se / gata S ac*.

²⁵⁴ This quotation does not appear in the Augustinian corpus, nor does this passage occur, to my knowledge, in the Hiberno-Latin computistical literature (although notice the mention of *Augustinus* in the chapter of the Munich Computus concerning the *mundus*, cf. Warntjes, *Munich Computus*, 144, §44). For the etymology of *mundus* from *munditia*, cf. perhaps Varro, *De lingua Latina*, V, xxix, 129 (*mundus muliebris dictus a munditia*). The rest of the passage probably represents a re-elaboration of Ambrosiaster, *Quaestiones Veteris et Novi Testamenti*, quaestio 2.3: *Hinc est unde deus, ut eius praesumptionem non potestate, sed ratione destrueret, materiam condidit, quae esset rerum confusio, ex qua faceret mundum. Distincta enim, quae simul confusa erant, hunc praestiterunt quem uidemus ornatum. Discretis enim ab inuicem substantiis facta conpaginatione mundus uocatur, quia unaquæque res ab altera segregata ad mundum apparuit*. It should indeed be noted that the *Quaestiones*, which Alexander Souter attributed to the so-called Ambrosiaster in his *Study of Ambrosiaster* (Cambridge, 1905), are normally ascribed to Augustine in the manuscript tradition: therefore, the name *Augustinus* could have been mentioned in the *titulus* opening the copy of the *Quaestiones* to which the author of *DDT* had access. Interestingly, a passage matching *verbatimim* the Pseudo-Augustinian quotation in *DDT* resurfaces much later in the *Liber Floridus* (cf. Wolfenbüttel, Herzog August Bibliothek, cod. Guelf. I Gud. lat., fol. 31r, where the external rim of the lower diagram contains the following sentence: *Mundus a mundicia nomen accepit, quia in principio omnis creatura uerbo Dei ad mundum apparuit, hoc est aperta et clara. Siue a motu quia mundi elementa semper in motu sunt, ut celum sol luna et omnia que in eis sunt*).

*tempora et noctes et dies et anni semper in motu sunt, quibus elementis, ut ait Isidorus, ‘nulla requies concessa est.’*²⁵⁵ *Greci nomen mundo de ornamento adcommodaerunt*²⁵⁶ *propter diuersitatem elementorum et pulchritudinem siderum. Appellatur apud eos cosmos, quod significat firmamentum uel ornamentum; cosmia enim grece ornamenta dicuntur. Nichil uero mundo pulchrius oculis carnis aspicimus.’*²⁵⁷

²⁵⁵ The copy of *DDT* in *B* (fol. 35v) ends here.

²⁵⁶ *adcommodaerunt S ac.*

²⁵⁷ Isidore, *Etymologiae*, XIII, 1, 1–2 (although the explanation *firmamentum* for *cosmos* and the phrase *cosmia enim grece ornamenta dicuntur* are interpolated). Cf. also *Etymologiae*, III, XXIX, 1.

APPENDIX II

The Irish divisions of time: a handlist of manuscripts

In the below lists, an asterisk indicates the manuscripts for which I have been able to consult the original, a digital facsimile, or a microfilm.

1. *Standard DDT*

(A) ‘*DDT proper*’ only

- (1) *Bern, Burgerbibliothek, 417 (s. IX¹ [AD 826?], Loire Valley, possibly Tours or Fleury), fols 33, 47r–61v.
- (2) *Bern, Burgerbibliothek, AA.90.16 (s. IX; acephalous), fols 1r–8v.
- (3) Chartres, Bibliothèque Municipale, 132 (s. IX; MS destroyed in 1944), fols 111v–126r.
- (4) *Cologne, Dombibliothek, 83-II (AD 805, Cologne), fols 37r–44r.
- (5) *Florence, Biblioteca Laurenziana, Plut.45.23 (s. XII), fols 51v–61r.
- (6) *Oxford, Bodleian Library, Canon. Misc. 560 (s. XI, northern Italy), fols 30r–39r (recently discovered by Immo Warntjes; this is a somewhat re-elaborated version, at times closer to *DDT aucti* 1 and 2, for which see below).
- (7) *Paris, BNF, Lat. 2341 (s. IX, prov. Le Puy-en-Velay), fols 9r–11v.
- (8) *Rome, Biblioteca Vallicelliana, E 26 (s. IXⁱⁿ, Lyon), fols 140v–152v.
- (9) *Valenciennes, Bibliothèque Municipale, 174 (s. IX^{ex}, St Amand), fol. 170v (only a fragment).

(B) Full *Standard DDT* (*Sententiae* + ‘*DDT proper*’), but without prologue

- (1) Barcelona, Biblioteca Central de Catalunya, 569 (s. XIV^{ex}, Spain), fols 24r–56v.

- (2) *Basel, Universitätsbibliothek, F III 15k (s. IX^{1/3}, Benediktbeuern? Fulda?), fols 21r–35v.
- (3) Chartres, Bibliothèque Municipale, 102 (s. X; MS destroyed in 1944), fols 76v–88r.
- (4) *Dijon, Bibliothèque Publique, 448 (s. XI [*c.* AD 1060], Dijon?), fols 24, 29r–35r.
- (5) *Laon, Bibliothèque Municipale, 410 (s. XII/XIII), fols 27r–30r, 31v–45v, 53v.
- (6) *Paris, BNF, Lat. 2796 (AD 813 x 815, northern France [Corbie?]), fols 70v–74v (*‘DDT proper’*), 78v–82v (*Sententiae*).
- (7) *Rome, Biblioteca Apostolica Vaticana (BAV), Urb.lat.290 (s. XI, Brauweiler), fols 34v–43v (*‘DDT proper’*), 44r–46r (*Sententiae*).

(C) Full *Standard DDT* (with prologue, *Sententiae* and *‘DDT proper’*)

- (1) *Bern, Burgerbibliothek, 336 (s. IX¹, Moselle area; incomplete), fols 46r–48v.
- (2) Florence, Biblioteca Riccardiana, Ricc. 379/1 (s. XI), 19v–?
- (3) *Geneva, Bibliothèque Publique et Universitaire, lat. 50 (AD 818 x 830, Massay), fols 135v–148v.
- (4) *Karlsruhe, Badische Landesbibliothek, Karlsruhe 442 (s. IX^{2/4}, western Germany), fols 63v–73v.
- (5) *Madrid, Biblioteca Nacional, 9605 (AD 1026, Provence), 73ra–83vb.
- (6) *Montpellier, Bibliothèque Universitaire de Médecine, H 384 (s. XI, south-eastern Francia), fols 65r–78r.
- (7) *Oxford, Bodleian Library, Bodley 309 (the *‘Sirmond manuscript’*; *c.* AD 1075, Vendôme), fols 62v–73v.
- (8) *Paris, BNF, Lat. 16361 (s. XII; a direct copy of Tours 334), pp. 248–279.
- (9) *Rome, BAV, Ross.247 (s. IX, central Francia), fols 152v–169v.

(10) Tours, Bibliothèque Municipale, 334 (s. IXⁱⁿ, Tours?), fols 20r–30v, 46–49.

(D) *Sententiae* only

(1) *Paris, BNF, Lat. 4860 (c. AD 900, Reichenau), fols 144vb–145va.

(2) Glasgow, Hunterian Museum, 467 (s. XII; prov. Dover), fols 21r–44v.

2. *Short DDTs*

(A) *Short DDT 1* (1 MS; 14 divisions listed, but only 8 actually treated, from *atomus* to *dies* and *nox*, then *annus*): *Angers, Bibliothèque Municipale, 476 (s. X, Brittany), fols 15r–17v.

(B) *Short DDT 2* (1 MS; 14 divisions listed, but only 11 actually treated, from *atomus* to *annus*): *Leiden, Universiteitsbibliotheek, Scaliger 28 (s. IXⁱⁿ, Flavigny), fols 40r–43r.

(C) *Short DDT 3* (6 MSS; 14 divisions listed and then quantified):

(1) *Cambridge, Corpus Christi College, 291 (c. AD 1065, Canterbury), fols 123v–124r.

(2) *Paris, BNF, Lat. 5239 (s. X, Limoges), fol. 116r–v.

(3) *Paris, BNF, Lat. 5543 (AD 847, Fleury), fol. 126r.

(4) *Rome, BAV, Reg.lat.1038 (s. X, southern Francia), fol. 126r.

(5) *Rome, BAV, Reg.lat.1260 (s. IX, Loire Valley), fol. 117r.

(6) *Strasbourg, Bibliothèque Nationale et Universitaire, 326 (c. AD 1000, Angoulême), fol. 164v.

(D) *Short DDT 4* (1 MS; a very short text listing 15 divisions of time and including *ostenta* and *partes*, entitled *Probus de diuisione temporum*; mentioned in Ó Cróinín, ‘*De ratione computandi*’, 124): *Rome, BAV, Vat.lat.3101 (AD 1077, Illmünster), fol. 9v.

(E) *Short DDT 5* (1 MS; a short text entitled *De numeratione*, beginning with a definition of time borrowed from *MC*, then listing and quantifying 13 divisions of time, i.e. the same ones found in the *Munich Computus* minus the *uicissitudo triformis*; a strange value of 5 atoms—spelt *addomi*—in a *momentum* is proposed here): *Rome, BAV, Vat.lat.6018 (s. VIII^{ex}–IXⁱⁿ, Italy), fol. 68r–v.

(F) *Short DDT 6* (1 MS; a short dialogue listing and quantifying 12 divisions of time, from *atomus* to *ciclum*): *St Gall, Stiftsbibliothek, 250 (IX^{4/4}, St Gall), pp. 115–16.

(G) *Short DDT 7* (4 MSS; a text offering a list and a quantification of the usual 14 divisions of time, substantially matching the beginning of the *Standard DDT*; significantly, this *Short DDT* ends abruptly with the sentence *Primum ergo interrogandum est de prima diuisione temporis quam athomum dicimus*):

(1) *Paris, BNF, Lat. 5239 (s. X, Limoges), fols 115v–116r.

(2) *Paris, BNF, Lat. 5543 (AD 847, Fleury), fols 125r–126r.

(3) *Paris, BNF, Lat. 7418 (s. XIV, Italy), 89v–90r.

(4) *Strasbourg, Bibliothèque Nationale et Universitaire, 326 (c. AD 1000, Angoulême), fol. 164r–v.

(H) *Short DDT 8* (1 MS; this text begins with an epitome of the *Sententiae in laude conpoti* and continues with a brief treatment of 10 divisions of time,

from *momentum* to *annus*): *Madrid, Biblioteca Nacional, 19 (s. XII, Ripoll), fol. 164r–v.

(I) *Short DDT 9* (1 MS; discovered by James Palmer; this is a list of 14 divisions, followed by a brief discussion of each unit): *Florence, Biblioteca Laurenziana, Plut. 20.54 (s. XI¹, central Italy), fol. 15.

(J) *Short DDT 10* (4 MSS; this text offers a list and a discussion of 13 divisions of time, from *atomus* to *saeculum*):

(1) *Rome, BAV, Pal.lat.1447 (s. IXⁱⁿ, Mainz), fols 3r–6r.

(2) *Rome, BAV, Pal.lat.1448 (s. IX¹, Trier), fols 1v–4v.

(3) Milan, Biblioteca Ambrosiana, M 12 sup. (s. IX², western Saxony?), fols 1r–2v (information obtained from Immo Warntjes).

(4) Schaffhausen, Stadtbibliothek, 61 (s. Xⁱⁿ, Lake Constance area), fol. 22 (information obtained from Immo Warntjes).

3. Manuscripts containing *excerpta* from, or related to, *DDT*

(1) *Barcelona, Archivo de la Corona de Aragón, Ripoll 59 (s. X/XI, Ripoll), fols 304v–305r.

(2) *Brussels, Bibliothèque Royale, 8654-72 (s. IXⁱⁿ, northern Francia), fols 203r–206r (excerpts discovered by Immo Warntjes).

(3) *Cambridge, Corpus Christi College, 291 (c. AD 1065, Canterbury), fols 126v–128r.

(4) *Cologne, Dombibliothek, 83-II (AD 805, Cologne), fols 205v–206v.

(5) *Cologne, Dombibliothek, 103 (AD 795, Cologne), fol. 58r (marg.).

(6) *Florence, Biblioteca Laurenziana, Plut.16.39 (s. IX¹, Verona), fols 40r–45r (excerpts from *Sententiae* and *DDT* embedded in the *computus* associated with Pacificus of Verona).

- (7) *London, British Library, Cotton MS Appendix LVI (s. XII^{1/4}, England), fol. 98r–v.
- (8) *Madrid, Biblioteca Nacional, 19 (s. XII, Ripoll), fols 82v–84r.
- (9) *Madrid, Biblioteca Nacional, 9605 (AD 1026, Provence), *passim* (esp. fols 70ra–71rb).
- (10) *Milan, Biblioteca Ambrosiana, H 150 inf. (*Bobbio Computus*; s. IX¹, Bobbio), *passim*.
- (11) *New York, Morgan Library, M.925 (AD 1038, Piacenza), fol. 41.
- (12) Padua, Biblioteca Antoniana, I 27 (s. IX/X), fols 41r–46v.
- (13) *Paris, BNF, Lat. 6400B (s. X¹, Fleury), *passim*.
- (14) *Paris, BNF, Lat. 7418A (AD 1042, Brittany, probably Landévennec), fols 20r–23v, 26r–29v.
- (15) *Paris, BNF, Lat. 18556 (s. IX, France), fols 8v–12r.
- (16) *Paris, BNF, NAL 456 (s. XI, Auch), fols 168v–169r.
- (17) *Rome, BAV, Ott.lat.6 (s. X, Nonantola), fols 25v–26v (excerpts from, or very similar to, the *Sententiae in laude conpoti*).
- (18) *Rome, BAV, Reg.lat.123 (AD 1055, Ripoll), *passim*.
- (19) *Rome, BAV, Reg.lat.612 (s. IX^{ex}–Xⁱⁿ), fols 37v–39r.
- (20) *Rome, BAV, Reg.lat.838 (s. IX), fol. 87r–v.
- (21) *Rome, BAV, Reg.lat.1324 (s. XV, France), fol. 41r–v.
- (22) *St Gall, Stiftsbibliothek, 251 (s. IX^{2/4}, St Gall), pp. 6–9, 12.

4. *DDT aucti*

(A) *DDT auctus* 1:

- (1) *Cologne, Dombibliothek, 83-II (AD 805, Cologne), fols 15r–28v.
- (2) *Laon, Bibliothèque Municipale, 422 (s. IX^{1/3}, area of Corbie?).

(B) *DDT auctus* 2: *Karlsruhe, Badische Landesbibliothek, Aug. perg. 229
(AD 806 x 821, Santo Stefano in Lucana), fols 32v–44r.

(C) *DDT auctus* 3:

(1) *London, British Library, Sloane 263 (s. XI, Lyon), fols 17r–19v
(ending abruptly with an incomplete discussion of the calends—a subsection of *de mense*).

(2) *Madrid, Biblioteca Nacional, 9605 (AD 1026, Provence), fols 98ra–
99va (from *atomus* to *mensis*).

(3) *Paris, BNF, Lat. 528 (s. X, Limoges), fols 72r–76r (from *atomus* to
mensis).

(4) *Paris, BNF, Lat. 894 (s. IX, Loire Valley?), fols 41v–44v (incomplete
text ending abruptly with the section about the night, probably due to the
loss of some folios).

(5) *Paris, BNF, Lat. 2183 (s. XI, France), fols 119r–122r (from *atomus* to
mensis; rather close to Lat. 894).

(C) *DDT auctus* 4: *London, British Library, Harley 3017 (s. IX, Fleury), fols
182v–185v.

BIBLIOGRAPHY

PRIMARY SOURCES

Ambrosiaster, *Quaestiones Veteris et Novi Testamenti*, ed. A. Souter, CSEL 50 (Vienna, 1908).

Anatolius Latinus, *De ratione paschali*, ed. D. Mc Carthy and A. Breen, *The ante-Nicene Christian Pasch. De ratione paschali: the Paschal Tract of Anatolius, Bishop of Laodicea* (Dublin, 2003), 45–53.

Annals of Ulster: ed. and trans. S. Mac Airt and G. Mac Niocaill, *The Annals of Ulster (to A.D. 1131)* (Dublin, 1983 [reprint Dublin, 2004]).

Anonymus ad Cuimnanum: Expositio Latinitatis, ed. B. Bischoff and B. Löfstedt, CCSL 133 D (Turnhout, 1992).

Ars Ambrosiana: Commentum anonymum in Donati partes maiores, ed. B. Löfstedt, CCSL 133 C (Turnhout, 1982).

Augustine, *De ciuitate Dei*, ed. B. Dombart and A. Kalb, CCSL 47–8 (Turnhout, 1955).

Augustine, *De genesi ad litteram*, ed. J. Zycha, CSEL 28/1 (Vienna, 1894).

Augustine, *De trinitate*, ed. W. J. Mountain and F. Glorie, CCSL 50 and 50A (Turnhout, 1968).

Bede, *De temporum ratione*, ed. C. W. Jones, *Bedae Venerabilis Opera, pars VI: Opera Didascalica 2*, CCSL 123 B (Turnhout, 1977), 263–544, and also C. W. Jones, *Bedae Opera de Temporibus* (Cambridge MA, 1943), 173–291; English trans.: F. Wallis, *Bede: The Reckoning of Time* (Liverpool, 1999).

Bede, *Historia ecclesiastica gentis Anglorum*, ed. and trans. R. A. B. Mynors and B. Colgrave, *Bede's Ecclesiastical History of the English People* (Oxford, 1969); now also M. Lapidge and P. Chiesa, *Storia degli Inglesi* (Rome, 2008).

Biblia Vulgata: ed. R. Weber, *Biblia Sacra iuxta Vulgatam Versionem* (Stuttgart, 1994 [4th ed., revised by R. Gryson]).

Boethius, *De institutione arithmetica*, ed. H. Oosthout and J. Schilling, *Anicii Manlii Severini Boethii De arithmetica*, CCSL 94 A (Turnhout, 1999).

Cassiodorus, *Institutiones*, ed. R. Mynors (Oxford, 1961).

Cath Maige Rath, ed. and trans. J. O'Donovan, *The Banquet of Dun na n-Gedh and the Battle of Magh Rath, an Ancient Historical Tale* (Dublin, 1842), 89–321.

Clemens Scottus, *Ars grammatica*, ed. J. Tolkiehn, *Clementis Ars Grammatica* (Leipzig, 1928).

Collectanea Pseudo-Bedae, ed. and trans. M. Bayless and M. Lapidge, *Collectanea Pseudo-Bedae* (Dublin, 1998).

Columbanus, *Epistulae* I and II, ed. and trans. G. S. M. Walker, *Sancti Columbani Opera* (Dublin, 1957), 2–23.

Corpus Iuris Hibernici: ad fidem codicum manuscriptorum, ed. D. A. Binchy, 6 vols (Dublin, 1978).

Cummian, *De controversia paschali*, ed. and trans. M. Walsh and D. Ó Cróinín, *Cummian's Letter De controversia paschali, together with a Related Irish Computistical Tract De ratione computandi* (Toronto, 1988), 55–97.

De ratione computandi, ed. D. Ó Cróinín, in M. Walsh and D. Ó Cróinín, *Cummian's Letter De controversia paschali, together with a related Irish computistical tract, De ratione computandi* (Toronto, 1988), 113–213.

Dicuil, *Liber de astronomia*: ed. M. Esposito, 'An unpublished astronomical treatise by the Irish monk Dicuil', *PRIA* 26 (1906–7), 378–446.

Diomedes, *Ars Grammatica*, ed. H. Keil, *Grammatici Latini*, vol. 1 (Leipzig, 1857), 299–529.

Dionysius Exiguus, *Epistola ad Bonifatium et Bonum* (or *Epistola Dionysii*), ed. B. Krusch, *Studien zur christlich-mittelalterlichen Chronologie: die Entstehung unserer heutigen Zeitrechnung* (Berlin, 1938), 82–7.

Dionysius Exiguus, *Epistola ad Petronium de cyclo magno paschae DCCCII annorum* (or *Prologus Dionysii*), ed. B. Krusch, *Studien zur christlich-*

mittelalterlichen Chronologie: die Entstehung unserer heutigen Zeitrechnung (Berlin, 1938), 63–8.

Donatus, *Ars maior*, ed. L. Holtz, *Donat et la tradition de l'enseignement grammatical* (Paris, 1981), 603–74.

Exemplum suggestionis Bonifati Primiceri Notariorum ad Iohannem Papam de ratione paschali, ed. B. Krusch, 'Ein Bericht der päpstlichen Kanzlei an Papst Johannes I. von 526 und die Oxforder Hs. Digby 63 von 814', in A. Brackmann (ed.), *Papsttum und Kaisertum. Forschungen zur politischen Geschichte und Geisteskultur des Mittelalters. Paul Kehr zum 65. Geburtstag* (Munich, 1925), 48–58.

Hrabanus Maurus, *De computo*, ed. W. Stevens, CCCM 44 (Turnhout, 1979), 199–321.

In Tenga Bithnua, ed. and trans. John Carey, *In Tenga Bithnua – The Ever-New Tongue*, Apocrypha Hiberniae II (Turnhout, 2009).

Isidore of Seville, *De ecclesiasticis officiis*, ed. C. W. Lawson, CCSL 113 (Turnhout, 1989).

Isidore of Seville, *De natura rerum*, ed. J. Fontaine, *Isidore de Séville: Traité de la nature; suivi de l'Épître en vers du roi Sisebut à Isidore* (Bordeaux, 1960); English trans. C. B. Kendall and F. Wallis, *Isidore of Seville: On the Nature of Things* (Liverpool, 2016).

Isidore of Seville, *Etymologiarum siue Originum libri XX*, ed. W. M. Lindsay (Oxford, 1911), and also, for book III, ed. G. Gasparotto and J.-Y. Guillaumin, *Étymologies, Livre III* (Paris, 2009); for book V, ed. Valeriano Yarza Urquiola and Francisco J. Andrés Santos, *Isidoro de Sevilla: Etimologías, Libro V* (Paris, 2013); English trans. S. A. Barney *et al.*, *The Etymologies of Isidore of Seville* (Cambridge, 2006).

Jerome, *Commentarius in Ecclesiasten*, ed. M. Adriaen, CCSL 72 (Turnhout, 1959), 249–361.

Macrobius, *Saturnalia*, ed. R. Kaster, Loeb Classical Library 510–12 (Cambridge, MA and London, 2011).

Munich Computus, ed. I. Warntjes, *The Munich Computus: Text and Translation. Irish Computistics between Isidore of Seville and the Venerable Bede and its Reception in Carolingian Times* (Stuttgart, 2010).

Prebium de multorum exemplaribus, ed. R. E. McNally, *Scriptores Hiberniae Minores pars I*, CCSL 108 B (Turnhout, 1973).

Priscian, *Institutiones grammaticae*, ed. H. Keil and M. Hertz, *Grammatici Latini*, vols II–III (Leipzig, 1855 and 1859).

Pseudo-Cyril, *Epistola Cyrilli*, ed. B. Krusch, *Studien zur christlich-mittelalterlichen Chronologie. Der 84jährige Ostercyclus und seine Quellen* (Leipzig, 1880), 344–9.

Sanas Cormaic, ed. W. Stokes, *Three Irish Glossaries* (Edinburgh and Oxford, 1862), 1–46; cf. also, ed. K. Meyer, ‘*Sanas Cormaic*’, *Anecdota from Irish Manuscripts*, vol. 5 (Dublin, 1913).

Symphosius, *Aenigmata*, ed. T. J. Leary, *Symphosius: the Aenigmata. An Introduction, Text and Commentary* (London and New York, 2014).

Varro, *De lingua Latina*, ed. G. Goetz and F. Schoell, Teubner (Leipzig, 1910).

Victorius of Aquitaine, *Cursus paschalis* (or *Prologus Victorii*), ed. Th. Mommsen, *MGH AA X* (Berlin, 1892), 666–756 = B. Krusch, *Studien zur christlich-mittelalterlichen Chronologie: die Entstehung unserer heutigen Zeitrechnung* (Berlin, 1938), 17–26.

Virgil, *Aeneis*, ed. M. Geymonat (Torino, 1973), 173–667.

Virgilius Maro Grammaticus, *Epitomae and Epistolae*, ed. B. Löfstedt, *Virgilius Maro Grammaticus: Opera omnia* (Munich and Leipzig, 2003).

SECONDARY SOURCES

- Barbet-Massin, Dominique: 'Le manuscrit 477 (461) d'Angers: étude codicologique et textuelle', *Britannia Monastica* 19 (2017), 15–43.
- Bauer, Bernhard: 'New and corrected MS readings of the Old Irish glosses in the Vienna Bede', *Ériu* 67 (2017), 29–48.
- Bisagni, Jacopo: 'A new citation from a work of Columbanus in BnF lat. 6400B', *Peritia* 24–25 (2013–14), 116–22.
- Bisagni, Jacopo: 'The newly-discovered Irish and Breton *computistica* in Città del Vaticano, BAV, MS Reg. Lat. 123', *Peritia* 28 (2017), 13–34.
- Bisagni, Jacopo, and Warntjes, Immo: 'Latin and Old Irish in the Munich Computus: a reassessment and further evidence', *Ériu* 57 (2007), 1–33.
- Bisagni, Jacopo, and Warntjes, Immo: 'The Early Old Irish material in the newly discovered *Computus Einsidlensis* (c. AD 700)', *Ériu* 58 (2008), 77–105.
- Bernhard Bischoff, 'Irische Schreiber im Karolingerreich', in B. Bischoff, *Mittelalterliche Studien: ausgewählte Aufsätze zur Schriftkunde und Literaturgeschichte*, 3 vols (Stuttgart, 1966–81), vol. 3, 39–54.
- Bischoff, Bernhard: *Katalog der festländischen Handschriften des neunten Jahrhunderts (mit Ausnahme der wisigotischen)*, 4 vols (Wiesbaden, 1998–2004).
- Blackburn, Bonnie, and Holford-Strevens, Leofranc: *The Oxford Companion to the Year: An Exploration of Calendar Customs and Time-Reckoning* (Oxford, 1999).
- Blume, D., Haffner, M., and Metzger, W.: *Sternbilder des Mittelalters. Der gemalte Himmel zwischen Wissenschaft und Phantasie*, 2 vols (Berlin and Boston MA, 2012–16).
- Borst, Arno: *Die karolingische Kalenderreform*, MGH Schriften 46 (Hannover, 1998).
- Borst, Arno: *Schriften zur Komputistik im Frankreich von 721 bis 818*, MGH Quellen zur Geistesgeschichte des Mittelalters 21, 3 vols (Hannover, 2006).

- Bronner, Dagmar: *Verzeichnis altirischer Quellen* (Marburg, 2013).
- Caiazzo, Irene (ed.), *Lectures médiévales de Macrobie: les Glosæ Colonienses super Macrobiūm* (Paris, 2002).
- Carey, John: *The Ever-New Tongue: the Text in the Book of Lismore* (Turnhout, 2018).
- Charles-Edwards, Thomas: *Early Christian Ireland* (Cambridge, 2000).
- Contreni, John J.: 'Counting, calendars, and cosmology: numeracy in the early Middle Ages', in J. J. Contreni and S. Casciani (eds), *Word, Image, Number: Communication in the Middle Ages* (Florence, 2002), 43–83.
- Contreni, John J.: 'Old orthodoxies die hard: Herwagen's *Bridfertī Rameniensis Glossae*', *Peritia* 22–23 (2011–12), 15–52.
- Cordoliani, Alfred: 'Une encyclopédie carolingienne de comput: les *Sententiae in laude compoti*', *Bibliothèque de l'École des Chartes* 104 (1943), 237–43.
- Corning, Caitlin: *The Celtic and Roman Traditions: Conflict and Consensus in the Early Medieval Church* (New York, 2006).
- Dobcheva, Ivana: 'The umbrella of Carolingian computus', in M. J. Muñoz, P. Cañizares and C. Martín (eds), *La Compilación del Saber en la Edad Media* (Porto, 2013), 211–29.
- Doyle, Charles: *Studies in the Latin Christian Reception of Early Greek Materialism*, unpublished PhD thesis (National University of Ireland, Galway, 2019).
- Graff, Eric: 'The recension of two Sirmond texts: *Disputatio Morini* and *De diuisionibus temporum*', in I. Warntjes and D. Ó Cróinín (eds), *Computus and its Cultural Context in the Latin West, AD 300–1200* (Turnhout, 2010), 112–42.
- Grondeux, Anne, and Jeudy, Colette: 'À propos de *pus*: sens médiéval d'un mot antique', *Archivum Latinitatis Medii Aevi* 59 (2001), 139–60.
- Hagen, Hermann (ed.): *Anecdota Helvetica quae ad Grammaticam Latinam spectant* (Leipzig, 1870).

- Harrison, Kenneth: 'Episodes in the history of Easter cycles in Ireland', in D. Whitelock, R. McKitterick, D. Dumville (eds), *Ireland in Early Mediaeval Europe: Studies in Memory of Kathleen Hughes* (Cambridge, 1982), 307–19.
- Holford-Strevens, Leofranc: 'Paschal lunar calendars up to Bede', *Peritia* 20 (2008), 165–208: 178–87.
- Hughes, Kathleen: 'Irish monks and learning', in *Los monjes y los estudios: IV Semana de estudios monásticos, Poblet, 1961* (Poblet, 1963), 61–86.
- Hughes, Kathleen: *The Church in Early Irish Society* (Ithaca NY, 1966).
- Hughes, Kathleen: 'Evidence for contacts between the churches of the Irish and English from the Synod of Whitby to the Viking Age', in P. Clemoes and K. Hughes (eds), *England before the Conquest: Studies in Primary Sources presented to Dorothy Whitelock* (Cambridge, 1971), 49–68.
- Hughes, Kathleen: *Early Christian Ireland: Introduction to the Sources* (Cambridge, 1972).
- Jones, Charles W.: 'The "lost" Sirmond manuscript of Bede's "Computus"', *English Historical Review* 52 (1937), 204–13 [reprinted in C. W. Jones, *Bede, the Schools and the Computus* (Aldershot, 1994), article X]
- Jones, Charles W.: *Bedae Pseudepigrapha: Scientific Writings Falsely Attributed to Bede* (Ithaca, NY and London, 1939).
- Jones, Charles W.: 'Bede's place in medieval schools', in G. Bonner (ed.), *Famulus Christi: Essays in Commemoration of the Thirteenth Centenary of the Birth of the Venerable Bede* (London, 1976), 261–85 [reprinted in C. W. Jones, *Bede, the Schools and the Computus* (Aldershot, 1994), article V].
- Kenney, James F.: *The Sources for the Early History of Ireland: Ecclesiastical* (New York, 1929).
- Killion, Steven B.: *Bede's Irish Legacy: Knowledge and Use of Bede's Works in Ireland from the Eighth through the Sixteenth Century*, unpublished PhD thesis (University of North Carolina at Chapel Hill, 1992).

- Lambert, Pierre-Yves: 'Les commentaires celtiques à Bède le Vénérable', *Études Celtiques* 20 (1983), 119–43, and *Études Celtiques* 21 (1984), 185–206.
- Lambert, Pierre-Yves: 'Les gloses celtiques aux commentaires de Virgile', *Études Celtiques* 23 (1986), 81–128.
- Lambert, Pierre-Yves, and Bisagni, Jacopo: 'Notes sur quelques mots vieux-bretons du manuscrit Angers 477, f° 36r°', *Études Celtiques* 44 (2018), 155–62.
- Lapidge, Michael: 'Byrhtferth of Ramsey and the *Glossae Bridferti in Bedam*', *The Journal of Medieval Latin* 17 (2007), 384–400.
- Lapidge, Michael: 'Beda Venerabilis', in P. Chiesa and L. Castaldi (eds), *La Trasmissione dei Testi Latini del Medioevo / Mediaeval Latin Texts and their Transmission*, vol. 3 (Firenze, 2008), 65–8.
- Marenbon, John: *Boethius*, Great Medieval Thinkers Series (Oxford, 2003).
- Marstrander, Carl: 'A new version of the Battle of Mag Rath', *Ériu* 5 (1911), 226–47.
- Masi, Michael (ed.): *Boethius and the Liberal Arts: A Collection of Essays* (Bern, 1981).
- Masi, Michael: 'Boethius' *De institutione arithmetica* in the context of medieval mathematics', in L. Obertello (ed.), *Atti del Congresso Internazionale di Studi Boeziani (Pavia, 5–8 ottobre 1980)* (Rome, 1981), 263–72.
- Meyvaert, Paul: 'Discovering the calendar (*annalis libellus*) attached to Bede's own copy of *De temporum ratione*', *Analecta Bollandiana* 120 (2002), 5–64.
- Miles, Brent: *Heroic Saga and Classical Epic in Medieval Ireland* (Cambridge, 2011).
- Moran, Dermot: *The Philosophy of John Scottus Eriugena: a Study of Idealism in the Middle Ages* (Cambridge, 1989).
- Mosshammer, Alden: *The Easter Computus and the Origins of the Christian Era* (Oxford, 2008).

- Munzi, Luigi: 'Testi grammaticali e *renovatio studiorum* carolingia', in P. De Paolis, M. De Nonno, L. Holtz (eds), *Manuscripts and Tradition of Grammatical Texts from Antiquity to the Renaissance* (Cassino, 2000), 351–88.
- McCarthy, Daniel: 'Easter principles and a fifth-century lunar cycle used in the British Isles', *Journal for the History of Astronomy* 24 (1993), 204–24.
- McCarthy, Daniel: 'The origin of the *latercus* paschal cycle of the insular Celtic churches', *CMCS* 28 (1994), 25–49.
- McCarthy, Daniel, and Ó Cróinín, Dáibhí: 'The 'lost' Irish 84-year Easter table rediscovered', in D. Ó Cróinín, *Early Irish History and Chronology* (Dublin, 2003), 58–75 [first printed in *Peritia* 6–7 (1987–8), 227–42].
- McCluskey, Stephen C.: 'Astronomies in the Latin West from the fifth to the ninth centuries', in P. L. Butzer and D. Lohrmann (eds), *Science in Western and Eastern Civilization in Carolingian Times* (Basel, Boston MA and Berlin, 1993), 139–60.
- McNamara, Martin: 'The Irish affiliations of the *Catechesis Celtica*', *Celtica* 21 (1990), 291–334.
- Obrist, Barbara: 'Les manuscrits du *De cursu stellarum* de Grégoire de Tours et le ms Laon, Bibliothèque municipale 422', *Scriptorium* 56 (2002), 335–44.
- Ohashi, Masako: 'Theory and history: an interpretation of the paschal controversy in Bede's *Historia ecclesiastica*', in S. Lebecq, M. Perrin and O. Szerwiniack (eds), *Bède le Vénérable : entre Tradition et Postérité* (Lille, 2005), 177–85.
- Ó Corráin, Donnchadh: *Clavis Litterarum Hibernensium: Medieval Irish Books & Texts (c. 400 – c. 1600)*, 3 vols (Turnhout, 2017).
- Ó Cróinín, Dáibhí: 'A seventh-century Irish computus from the circle of Cummiánus', in D. Ó Cróinín, *Early Irish History and Chronology* (Dublin, 2003), 99–130 [first printed in *PRIA* 82 C 11 (1982), 405–30].

- Ó Cróinín, Dáibhí: 'The Irish provenance of Bede's computus', in D. Ó Cróinín, *Early Irish History and Chronology* (Dublin, 2003), 173–90 [first printed in *Peritia* 2 (1983), 229–47].
- Ó Cróinín, Dáibhí: 'The date, provenance and earliest use of the works of Virgilius Maro Grammaticus', in D. Ó Cróinín, *Early Irish History and Chronology* (Dublin, 2003), 191–200 [first printed in G. Bernt, F. Rädle and G. Silagi (eds), *Tradition und Wertung: Festschrift Franz Brunhölz* (Sigmaringen, 1989), 13–22].
- Ó Cróinín, Dáibhí: 'Bede's Irish computus', in D. Ó Cróinín, *Early Irish History and Chronology* (Dublin, 2003), 201–12.
- Ó Cróinín, Dáibhí: 'The continuity of Irish computistical tradition', in I. Warntjes and D. Ó Cróinín (eds), *Computus and its Cultural Context in the Latin West, AD 300–1200* (Turnhout, 2010), 324–47.
- Ó Néill, Pádraig P.: 'Boethius in early Ireland: five centuries of study in the sciences', in M. Kelly and C. Doherty (eds), *Music and the Stars: Mathematics in Medieval Ireland* (Dublin, 2013), 21–43.
- Pabst, Bernhard: *Atomtheorien des lateinischen Mittelalters* (Darmstadt, 1994).
- Picard, Jean-Michel: 'Adomnán's *Vita Columbae* and the cult of Colum Cille in Continental Europe', *PRIA* 98 C (1998), 1–23.
- Rand, Edward K: *Johannes Scottus* (Munich, 1906).
- Rovelli, Carlo: *L'Ordine del Tempo* (Milan, 2017); English trans.: *The Order of Time* (New York, 2018).
- Santoni, Anna: 'De signis coeli and De ordine ac positione stellarum in signis: two star catalogues from the Carolingian age', in F. Pontani (ed.), *Certissima signa. A Venice Conference on Greek and Latin Astronomical Texts* (Pisa, 2017), 127–44.
- Schneiders, Marc: 'The Irish Calendar in the Karlsruhe Bede (Karlsruhe, Badische Landesbibliothek, Cod. Aug. CLXVII, ff. 16v–17v)', *Archiv für Liturgiewissenschaft* 31 (1989), 33–78.

Smith, Julia M. H.: *Relics and the Insular World, c. 600–c. 800*, Kathleen Hughes Memorial Lectures, 15 (Cambridge, 2017).

Smyth, Marina: ‘Isidore of Seville and Early Irish cosmography’, *CMCS* 14 (1987), 69–102.

Smyth, Marina: *Understanding the Universe in Seventh-Century Ireland* (Woodbridge, 1996).

Smyth, Marina: ‘Isidorian texts in seventh-century Ireland’, in A. Fear and J. Wood (eds), *Isidore of Seville and his Reception in the Early Middle Ages: Transmitting and Transforming Knowledge* (Amsterdam, 2016), 111–30.

Springsfeld, Kerstin: *Alkuins Einfluß auf die Komputistik zur Zeit Karls des Großen* (Stuttgart, 2002).

Stancliffe, Clare: ‘“Charity with peace”: Adomnán and the Easter question’, in J. Wooding, R. Aist, T. O. Clancy and T. O’Loughlin (eds), *Adomnán of Iona: Theologian, Lawmaker, Peacemaker* (Dublin, 2010), 51–68.

Stansbury, Mark: ‘Irish biblical exegesis’, in R. Flechner and S. Meeder (eds), *The Irish in Early Medieval Europe: Identity, Culture and Religion* (London and New York, 2016), 116–30.

Stokes, Whitley, and Strachan, John (eds): *Thesaurus Palaeohibernicus: A Collection of Old Irish Glosses, Scholia, Prose and Verse*, 2 vols (Cambridge, 1901–1903 [reprint: Dublin, 1975]).

Tedeschi, Mario: ‘Un centro scrittorio nell’Abruzzo franco. Il Ms. Aug. Perg. 229 e il monastero di S. Stefano in Lucana’, *Bullettino dell’Istituto Storico Italiano per il Medio Evo* 116 (2014), 1–23.

Warntjes, Immo: ‘A newly discovered Irish Computus: *Computus Einsidlensis*’, *Peritia* 19–20 (2005–6), 61–4.

Warntjes, Immo: ‘A newly discovered Prologue of AD 699 to the Easter table of Victorius of Aquitaine in an unknown Sirmond manuscript’, *Peritia* 21 (2010), 255–84.

Warntjes, Immo: ‘Seventh-century Ireland: the cradle of medieval science?’, in M. Kelly and C. Doherty (eds), *Music and the Stars: Mathematics in Medieval Ireland* (Dublin, 2013), 44–65.

Warntjes, Immo: ‘Victorius vs Dionysius: the Irish Easter Controversy of AD 689’, in P. Moran and I. Warntjes (eds), *Early Medieval Ireland and Europe: Chronology, Contacts, Scholarship. A Festschrift for Dáibhí Ó Cróinín* (Turnhout, 2015), 33–97.

Warntjes, Immo: ‘Computus as scientific thought in Ireland and the Early Medieval West’, in R. Flechner and S. Meeder (eds), *The Irish in Early Medieval Europe: Identity, Culture and Religion* (London and New York, 2016), 158–78.

Warntjes, Immo: ‘State of research on Late Antique and Early Medieval Computus’, in I. Warntjes and D. Ó Cróinín (eds), *Late Antique Calendrical Thought and its Reception in the Early Middle Ages (Proceedings of the 3rd International Conference on the Science of Computus in Ireland and Europe, Galway, 16–18 July, 2010)* (Turnhout, 2017), 1–42.

Warntjes, Immo: ‘An Irish eclipse prediction of AD 754: the earliest in the Latin West’, *Peritia* 24–25 (2013–14), 108–15.

Westgard, Joshua A.: ‘Bede and the continent in the Carolingian age and beyond’, in S. DeGregorio (ed.), *The Cambridge Companion to Bede* (Cambridge, 2010), 201–15.

The Department of Anglo-Saxon, Norse, and Celtic offers programmes of study, at both undergraduate and graduate level, on the pre-Norman culture of Britain and Ireland in its various aspects: historical, literary, linguistic, palaeographical, archaeological. The Department also serves as a focal point for scholars visiting Cambridge from various parts of the world, who are attracted to Cambridge by the University Library (one of the largest in the world), the collections of Anglo-Saxon and Celtic manuscripts in the University and various college libraries, the collection of Anglo-Saxon, Celtic and Scandinavian coins in the Fitzwilliam Museum, or the rich collection of Anglo-Saxon artefacts in the Museum of Archaeology and Anthropology. It is possible for the Department to host a small number of Visiting Scholars each year.

Information on any aspect of the Department's activities can be obtained by writing to: The Head of Department, Department of Anglo-Saxon, Norse and Celtic, Faculty of English, 9 West Road, Cambridge, CB3 9DP.

Further information on the Department, on the Anglo-Saxon, Norse and Celtic Tripos, and on opportunities for postgraduate study, is available on our website: www.asnc.cam.ac.uk. Learn more about the Department's activities on Twitter @Department_ASNC.

All of the Department's publications can be found listed at www.asnc.cam.ac.uk

KATHLEEN HUGHES MEMORIAL LECTURES**ISSN 1475-9098**

1. David N. Dumville, *Saint David of Wales* ISBN 0 9532172 4 8
2. David Stephenson, *The Aberconwy Chronicle* ISBN 0 9532697 9 5
3. R. R. Davies, *The King of England and the Prince of Wales, 1277–84: Law, Politics, and Power* ISBN 0 9543186 9 2
4. Scott Gwara, *Education in Wales and Cornwall in the Ninth and Tenth Centuries: Understanding Deraris fabulis* ISBN 0 9047080 4 8
5. K. R. Dark, *Archaeology and the Origins of Insular monasticism* ISBN 1 9047081 5 3
6. Paul Russell, *‘Read it in a Glossary’: Glossaries and Learned Discourse in Medieval Ireland* ISBN 978 0 9554568 6 2
7. Oliver Padel, *Slavery in Saxon Cornwall: the Bodmin Manumissions* ISBN 978 0 9562353 0 5
8. Colmán Etchingham, *The Irish ‘Monastic Town’: Is this a Valid Concept?* ISBN 978 0 9562353 1 2
9. M. T. Flanagan, *Reform in the Twelfth-century Irish Church: A Revolution of Outlook?* ISBN 978 0 95718628 6
10. T. M. Charles-Edwards, *St Patrick and the Landscape of Early Christian Ireland* ISBN 978 0 95718621 7
11. Alex Woolf, *The Churches of Pictavia* ISBN 978 0 95718626 2
12. Robert Bartlett, *Gerald of Wales and the Ethnographic Imagination* ISBN 978 1 909106 00 0
13. Nancy Edwards, *The Early Medieval Sculpture of Wales: Text, Pattern and Image* ISBN 978 1 909106 05 5
14. J. E. Fraser, *Iona and the Burial Places of the Kings of Alba* ISBN 978 1 909106 10 9
15. Julia Smith, *Relics and the Insular World, c. 600–c. 850* ISBN 978 1 909106 15 4
16. Elva Johnston, *When Worlds Collide? Pagans and Christians in Late Antique Ireland* ISBN 978 1 909106 20 8
17. David N. Parsons, *Warning: May Contain Saints. Place-Names as Evidence for the Church in Early Wales* ISBN 978 1 909106 239
18. Jacopo Bisagni, *From Atoms to the Cosmos: the Irish Tradition of the Divisions of Time in the Early Middle Ages* ISBN 978-1-909106-246