COMPUTUS MONACENSIS
(MUNICH COMPUTUS)

Fueled by exegetical questions, the Easter controversy, and an influx of late-antique texts, Irish monks developed, in the seventh century, a new discipline of monastic learning, computus. At its core this was a calendrical science centred around the calculation of Easter, but it soon included wider concepts that would explain God's creation as manifested in the cosmos. This new discipline needed textbooks, three of which survive from early eighth-century Ireland: the *Computus Einsidlensis* (cfr. in this volume pp. 119-25), the Munich Computus, and *De ratione conputandi* (cfr. in this volume pp. 133-41).

Of these, only the Munich Computus is securely datable: Calendrical algorithms were often illustrated by application to the present year of the writer/compiler. The Einsiedeln computist of *ca*. 700 preferred to keep algorithms more abstract, but when outlining a method to calculate the Julian calendar date and lunar age of Easter Sunday, he argued that should someone want to verify this algorithm, they should apply it to their present year[1]. The Munich computist took up this suggestion (one indication that this scholar worked from the *Computus Einsidlensis* or a closely related text), and applied the method to the years 719-21, calling the Easter of 719 the imminent year (*annus imminens*). Thus, this text must have been written between Easter 718 and Easter 719[2]. Its Irish authorship is evidenced by the use of some Old Irish terms and phrases integral to the otherwise Latin text[3]. Also, Old English *gerīm* is used by its author, which demonstrates the interconnectedness of computistical scholars in the insular world[4].

The Munich Computus (München, Bayerische Staatsbibliothek, Clm 14456, ff. 8r-46r; St Emmeram in Regensburg, late 810s/early 820s) was

1. Einsiedeln, Stiftsbibliothek 321 (Msc. 647; 4 Nr. 97), p. 112: «Haec autem exempli causa ostendimus. Sed si quis in decennouenali ciclo huius numeri ueritatem cognoscere uoluerit, presenti sibi anno indesinenter inuestiget».

2. I. Warntjes (ed.), *The Munich Computus: Text and Translation. Irish Computistics between Isidore of Seville and the Venerable Bede and Its Reception in Carolingian Times*, Stuttgart 2010, pp. LVII-LXI.

3. J. Bisagni - I. Warntjes, *Latin and Old Irish in the Munich Computus: A Reassessment and Further Evidence*, «Ériu», 57 (2007), pp. 1-34.

4. I. Warntjes, *The Earliest Occurrence of Old English gerīm and its Anglo-Irish Computistical Context*, «Anglia», 127 (2009), pp. 91-105.

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identified as a text contemporary to or even by Bede by Bernhard Joseph Docen in 1824 when surveying Regensburg manuscripts recently acquired by the then Königliche Hof- und Centralbibliothek (now Bayerische Staatsbibliothek) in Munich[5]. But it was Bruno Krusch who first analysed it and therewith introduced it to modern scholarship in his PhD dissertation printed in 1880[6]. Since then, it has primarily been studied as the most important witness (before the discovery of the Padua *latercus* in the 1980s[7]: Padova, Biblioteca Antoniana, I. 27, ff. 76r-77v; Verona?, s. IX *ex.*) of an Easter reckoning followed uniquely in Britain and Ireland until the eighth century, and for its Irish terms and Hiberno-Latin features[8]. A full critical edition and English translation is available since 2010[9].

The Munich Computus principally follows the same structure as other contemporary Irish texts of the same genre[10], but its character is different, in some ways it appears more primitive: while the *Computus Einsidlensis* excels through its almost scholastic method of argumentation, and *De ratione conputandi* through its scientific precision, the Munich Computus comes across more like a *florilegium* of excerpts under specific heading.

In this, the author relies not only on the standard *corpus* of texts available in seventh-century Ireland (principally Isidore's cosmological and encyclopedic works as well as Macrobius and Anatolius Latinus for the first half of the text, and the so-called Sirmond collection of late-antique tracts on the Easter question for the second)[11], but also on a textbook of 689 advocating the Victorian Easter reckoning. The early Middle Ages knew three methods for calculating Easter: the *latercus*, an 84-year Easter cycle invented by Sulpicius Severus in *ca.* 410 and in the early Middle Ages followed exclusively, according to surviving sources, in Ireland and Britain and by

5. B. J. Docen, *Einige Notizen über die Handschrift der sogenannten Annales Ratisponenses (748-823)*, «Archiv der Gesellschaft für ältere deutsche Geschichtskunde», 5 (1824), pp. 515-9.

6. B. Krusch, *Studien zur christlich-mittelalterlichen Chronologie. Der 84jährige Ostercyclus und seine Quellen*, Leipzig 1880, pp. 10-6.

7. D. P. Mc Carthy - D. Ó Cróinín, *The "Lost" Irish 84-Year Easter Table Rediscovered*, «Peritia», 6/7 (1987/8), pp. 227-42, repr. in D. Ó Cróinín, *Early Irish History and Chronology*, Dublin 2003, pp. 58-75.

8. For a state of research on this text, cfr. Warntjes, *Munich Computus* cit., pp. XV-XXIII.

9. Warntjes, *Munich Computus* cit.

10. For content and structure of early medieval Irish computistical textbooks, cfr. *Computus Einsidlensis* and *De ratione conputandi* in this volume, pp. 119-22 and pp. 133-9.

11. On the Sirmond *corpus* of texts, cfr. now I. Warntjes, *Isidore of Seville and the Formation of Medieval Computus*, in *A Companion to Isidore of Seville*, curr. A. T. Fear - J. Wood, Leiden 2020, pp. 457-523, at pp. 477-8 with further literature.

Irish monks on the Continent (like Columbanus)[12]; the 532-year Easter table created by Victorius of Aquitaine at the request of the papal curia in 457; and the Alexandrian / Dionysiac Easter reckoning, established in Alexandria in the early fourth century and translated into Latin by Dionysius Exiguus in 525[13]. In southern Ireland, the *latercus* was replaced by Victorius in the 630s, who in turn gave way to Dionysius towards the end of the seventh and the early eighth centuries. These changes to liturgical practice were accompanied by considerable debate. The Dionysiac Munich Computus provides a unique window into the technical issues discussed during the seventh-century Irish stage of the late antique and early medieval Easter controversy, principally second-hand through its Victorian informant of 689.

It has been argued that besides a few scattered subchapters throughout, the Munich Computus' final chapters 63-68 should be attributed to its Victorian source of 689[14]: a catalogue of arguments against celebrating Easter Sunday on (as against after) the Easter full moon and directed at adherents of the *latercus* in northern Ireland; a short chronological calculation based on Victorius' prologue; a comparison of various Easter tables with the 532-year Easter cycle of Victorius; a catalogue of disruptions of time mentioned in the Bible, based on the southern-Irish *De mirabilibus sacrae scripturae* of 654[15]; a proof that the 95-year Easter table of Dionysius is not cyclic in its solar data; a short chronicle, again based on *De mirabilibus*.

This reads like a dossier of arguments against the *latercus* and Dionysius compiled by followers of Victorius, which aligns with a southern perspective on the Easter debate in Ireland in 689. By 718/9, however, the tide

12. The *latercus* is reconstructed by D. Mc Carthy, *Easter Principles and a Fifth-Century Lunar Cycle Used in the British Isles*, «Journal for the History of Astronomy», 24 (1993), pp. 204-24; for a translation, cfr. B. Blackburn - L. Holford-Strevens, *The Oxford Companion to the Year*, Oxford 1999, pp. 870-5; a recent summary in I. Warntjes, *The Mechanics of Lunar Calendars and the Modes of Calculating Easter, AD 400-1100: Contexts and Perspectives*, in *La conoscenza scientifica nell'alto medioevo*, Settimane di studio del Centro italiano di studi sull'alto Medioevo 67, Spoleto 2020, pp. 273-310, at pp. 282-6.

13. Victorius' and Dionysius' *Computistica* are ed. by B. Krusch, *Studien zur christlich-mittelalterlichen Chronologie. Die Entstehung unserer heutigen Zeitrechnung*, «Abhandlungen der Preußischen Akademie der Wissenschaften, Jahrgang 1937, phil.-hist. Kl.», 8 (1938), pp. 4-52 and 59-86. Literature on these two reckonings is listed in Warntjes, *Munich Computus* cit., p. XXXVIII, n. 82 and p. XXXIX, n. 85.

14. Warntjes, *Munich Computus* cit., pp. CXXIV-CXXVI.

15. PL, vol. XXXV, coll. 2149-200. Cfr. the literature conveniently listed by D. Ó Corráin, *Clavis litterarum Hibernensium: Medieval Irish Books and Texts (c. 400-c. 1600)*, 3 vols., Turnhout 2017, pp. 728-31.

had turned in favour of Dionysius, and the Munich computist had a natural interest in providing evidence of the validity of this newly accepted method of calculating Easter. One of the graver accusations that supporters of Dionysius faced was that this Easter reckoning did not provide data in accordance with the Gospels for the historic passion and resurrection of Christ, in whatever way this year was calculated. In 689, a pseudo-proof was developed that was supposed to vindicate Dionysius by an artificial alignment of Dionysiac and Victorian lunar data (*De comparatione epactarum Dionysii et Victorii*)[16]. The Munich computist worked from this text, but even added a third dimension by introducing *latercus* data to the discussion[17]. In the end, the Munich Computus is the only known text that compares all three Easter reckoning used in the early Middle Ages, and our best witness to the technical arguments advanced during the insular Easter controversy.

The date of composition of the Munich Computus, 718/9, may be suggestive in this context. The last Irish stronghold of the traditional *latercus*, Iona, adopted Dionysius in 716. It has been posited that this adoption of a new Easter reckoning called for the composition of a new textbook, with unusually frequent references to the system just abandoned, the *latercus*. From this perspective, Iona appears as a very likely place of composition, which is further accentuated by the fact that the Munich Computus incorporates (in its Victorian layer of 689) a quote not transmitted by Bede from pope-elect John's letter of 640 addressed to northern Irish ecclesiasts, including Abbot Ségéne of Iona[18]. On the other hand, Victorius, who features so prominently in the Munich Computus through its 689 layer, was only ever followed in the south, not in the north of the *regiones Scottorum*. This makes southern Irish authorship more likely, and points to a slightly different context of composition[19]. Undoubtedly, the very recent intro-

16. Ed. in Warntjes, *Munich Computus* cit., pp. 322-6, with commentary pp. CLII-CLVIII; cfr. also I. Warntjes, *Victorius vs Dionysius: The Irish Easter Controversy of AD 689*, in *Early Medieval Ireland and Europe: Chronology, Contacts, Scholarship*, curr. P. Moran - I. Warntjes, Turnhout 2015, pp. 33-98, at pp. 54-5, 70, 73-4.

17. For the Munich computist's use of *latercus* data, cfr. especially I. Warntjes, *The Munich Computus and the 84 (14)-year Easter Reckoning*, «Proceedings of the Royal Irish Academy, Section C», 107 (2007), pp. 31-85.

18. D. Ó Cróinín, *A Seventh-Century Irish Computus from the Circle of Cummianus*, «Proceedings of the Royal Irish Academy, Section C», 82 (1982), pp. 405-30, repr. in Ó Cróinín, *Early Irish History* cit., pp. 99-132, at pp. 126-7.

19. Warntjes, *Munich Computus* cit., pp. LXXVII-XCVI.

duction of Dionysius was instrumental in the invention of this new literary genre – comprehensive computistical textbooks – in Ireland, but the trigger for writing the Munich Computus was more technical: the Alexandrian / Dionysiac Easter reckoning was based, like Victorius, on a 532-year luni-solar cycle, but circulated as 95-year Easter tables that had to be updated at the expiry of that period. Dionysius' Easter table covered the years 532-626, its successor 627-721. 718/9, two years before the expiry of the existing table, was therefore an opportune moment to compile a full-scale manual on computistical theory and Alexandrian / Dionysiac principles as preparation for the re-calculation.

The Munich Computus received a noteworthy reception for roughly a century after its composition, before Irish and Visigothic computistical thought got largely eclipsed by the growing influence of Bede in the Carolingian world in the course of the ninth century. It left traces from Brittany to Regensburg, with particularly strong impact in Breton circles and Cologne[20]. The late ninth-century Breton manuscript Angers, Médiathèque Toussaint 477 (461) mainly assembles Bede's three scientific works (*De natura rerum* and *De temporibus* of 703, and *De temporum ratione* of 725)[21], commented on here through extensive glossing in two principal hands, contemporary *A* and later *B*. *A* copies extensively not only from the Munich Computus, but also from *De ratione conputandi*, and in the vast *corpus* of glosses to Bede's scientific works, this is the only manuscript to utilise Irish computistical textbooks of the early eighth century[22].

Equally impressive is the link between the Munich Computus and Köln, Erzbischöfliche Diözesan- und Dombibliothek 83 II (Darmst. 2084). The late 790s to the 820s saw the production of three major Carolingian computistical *encyclopaediae* (now referenced through the abbreviations assigned to them by their editor, Arno Borst: *Lib ann.* of 793, *Lib. comp.* of 809/810, and *Lib. calc.* of 818)[23]. These were the result of centralised efforts to systematise computistical knowledge. A first, essential step in this process was the collection of the known information, spear-

20. Cfr. the discussion in Warntjes, *Munich Computus* cit., pp. XCVII-CVI, CLIX-CCI.

21. Bede's scientific works are ed. by C. W. Jones in CCSL 123.

22. Warntjes, *Munich Computus* cit., pp. CLXXXIII-CLXXXVII. On the manuscript and its background, cfr. now D. Barbet-Massin, *Le manuscrit 477 (461) d'Angers: étude codicologique et textuelle*, «Britannia Monastica», 19 (2017), pp. 15-43.

23. A. Borst, *Schriften zur Komputistik im Frankenreich von 721 bis 818*, 3 vols., Hannover 2006, pp. 660-772, 1054-334, 1367-451.

headed by the most important bishoprics of the time. In Cologne under Archbishop Hildebold († 818), two complementary codices were produced: Köln, Erzbischöfliche Diözesan- und Dombibliothek 103 (Darmst. 2103), containing mainly Bede's scientific works, and 83 II, which principally collected everything non-Bedan, from late antique Easter letters through Isidore of Seville to anonymous Irish texts (including *De comparatione epactarum Dionysii et Victorii* of 689, one of the Munich Computus' key sources that survives only in this codex)[24]. Yet, *computistica* circulated not only in texts, diagrams, and tables, but also in more free-floating ideas. These were assembled in a text compiled for this codex (labelled *Comp. Col.* of 805 by Borst), which drew heavily on Irish thought and shows the most parallels to the Munich Computus of any surviving Carolingian text[25].

A similar background may account for the sole copy of the Munich Computus, though perhaps more in a confrontational spirit of divergent traditions than designed as a unifying collection of available knowledge. Through Arn of Salzburg († 821), the heartland of Frankish computistical thought, the area between Seine and Rhine, became closely connected to the German south-east. He was abbot of Saint-Amand since 782 before he became bishop and then archbishop of Salzburg, and he held the abbacy and bishopric in personal union. When the abbey of St Emmeram in Regensburg started to build up a substantial library from the late eighth century onwards, it appears to have benefited from Arn's network. Two of the earliest computistical manuscripts in St Emmeram – München, Bayerische Staatsbibliothek, Clm 14725 of the early ninth century and Clm 210 of 818 (one of two manuscripts of *Lib. calc.*) – were imports from Saint-Amand and Salzburg respectively. Assuming they reached St Emmeram very soon after their compilation, they introduced a very strong Bedan tone. The earliest local computistical production surviving in full, Clm 14456 probably written in the late 810s or very early 820s, can be read as a reaction to this outside imposition. Its principal text is the Munich Computus, a reminder of St Emmeram's Irish legacy, which we can otherwise grasp through the Irish *computistica* copied around 800 that only sur-

24. Cfr. especially I. Warntjes, *Köln als naturwissenschaftliches Zentrum in der Karolingerzeit: die frühmittelalterliche Kölner Schule und der Beginn der fränkischen Komputistik*, in *Mittelalterliche Handschriften der Kölner Dombibliothek: viertes Symposion der Diözesan- und Dombibliothek Köln zu den Dom-Manuskripten*, curr. H. Finger - H. Horst, Köln 2012, pp. 41-96.

25. *Schriften*, Borst (ed.), pp. 885-950; for the dependency of *Comp. Col.* on the Munich Computus, cfr. Warntjes, *Munich Computus* cit., pp. CLXXIX-CLXXXV.

vive in a fragmented codex[26]. It also contains a bare calendar, whose layout could have been provoked by the overloaded festal calendar of Clm 210[27]; likewise, Clm 14456 provided a neater tabular system for establishing the lunar ages of any given Julian calendar date that rivaled the faulty and over-dimensional full lunar calendar of Clm 210[28]. Interestingly, before 823, the greater St Emmeram annals were added to Clm 14456[29], so that the codex with its dominant Irish text and its added annals reads like a statement of St Emmeram identity and intellectual independence against standardising tendencies imposed from the outside (and similar tendencies can be detected at the same time in Montecassino, Lyon, and other places).

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26. The fragmented codex is CLA XI, no. 144; cfr. B. Bischoff, *Katalog der festländischen Handschriften des neunten Jahrhunderts (mit Ausnahme der wisigothischen)*, 4 vols., Wiesbaden 1998-2017, vol. II, p. 289. The computistica are Harvard, Houghton Library, Typ 613, f. 7r-v; Regensburg, Staatliche Bibliothek, Frag., ff. 1ar–v, 1dr–1ev; for these, cfr. the preliminary study in Warntjes, *Munich Computus* cit., pp. CLXXXVII-CXCI.

27. Compare Clm 210, ff. 7v-15v with Clm 14456, ff. 48r-53v; for these two calendars, cfr. A. Borst, *Der karolingische Reichskalender und seine Überlieferung bis ins 12. Jahrhundert*, 3 vols., Hannover 2001, pp. 75, 197-8.

28. Compare Clm 210, ff. 145v-162v (*Reichskalender*, Borst [ed.], pp. 1645-727) with Clm 14456, ff. 54r-63r (in combination with the preceding calendar). The argument driven here could be further accentuated if what Borst calls the *Regensburger Protestbrief* of 809 (*Epist. Rat.*, in *Schriften*, Borst [ed.], pp. 1021-33) was indeed a reaction to the centralising tendencies favouring Bede, and if it then was included for that reason in the only manuscript that transmits it: Clm 14456.

29. The *Annales Sancti Emmerammi Ratisponensis maiores* are ed. by G. H. Pertz in MGH SS I, pp. 91-3.