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THE EARLY OLD IRISH MATERIAL IN THE NEWLY DISCOVERED
COMPUTUS EINSIDLENSIS (*ca*. AD 700)

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ABSTRACT

The *Computus Einsidlensis* (Einsiedeln, Stiftsbibliothek, 321 (647), pp. 82-125) is a recently discovered text in the Swiss monastery of Einsiedeln. Besides its importance for the study of computistics in the early middle ages in general, and of seventh- and eighth-century Irish monastic learning in particular, the fact that this Latin text incorporates a considerable number of Old Irish terms makes it especially important also for the study of Old Irish. A dating to the period AD 689 to 719 is provided, together with an analysis of all the Old Irish material from this period of transition from Early to Classical Old Irish.

1. INTRODUCTION[1]

In an article published in the last volume of *Ériu*, we discussed the implications of code-switching and code-mixing from Latin to Old Irish in computistical literature on the basis of what we then believed to be the only known computistical text incorporating a considerable number of Old Irish words, viz. the Munich Computus.[2] The importance of this text for the study of code-switching and code-mixing from Latin to Old Irish is highlighted by the fact that it constitutes one of the very few cases in which this phenomenon occurs in the main body of a text, rather than in glosses or commentaries. Moreover, the Munich Computus is securely datable to AD

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[1] We would like to thank the librarian of the Einsiedeln monastery, P. Odo Lang, OSB, for his kindness when Immo Warntjes examined the manuscript *in situ*, for his generosity in providing us with coloured photographs of the text, as well as for permission to print the facsimiles found in the present article.

[2] Jacopo Bisagni and Immo Warntjes, 'Latin and Old Irish in the Munich Computus: A reassessment and further evidence', *Ériu* 57 (2007), 1-33. The text in question is München, Bayerische Staatsbibliothek, Clm 14456, fol. 8r-46r.

719,[3] a fact which is particularly significant for the chronological placement not only of the phenomenon in question, but also of the Old Irish forms proper.

It will be useful to summarise here some of the conclusions that we reached in that article. As a result of our analysis, we suggested that code-switching and -mixing from Latin to Old Irish in the Munich Computus may generally be explained as a shift from a high/formal to a low/informal register, facilitated by the very nature of the text in question: since the Munich Computus was undoubtedly one of the earliest computistical textbooks written in Latin, not only in Ireland, but in the entire Latin West, many technical concepts and methods described therein had never been previously formulated. Moreover, computistics was, beside exegesis and grammar, one of the three main subjects taught in Irish monastic schools of the early medieval period;[4] every student in these schools had to learn the basics of time-reckoning, first and foremost to gain a thorough understanding of the principal mechanisms that regulated the calculation of the most important Christian feast, Easter. Yet, it can hardly be presumed that all students had an equally good grasp of the educational language used in these schools, that is Latin, which was the second language for all students. Consequently, especially in the class-room, a monastic teacher was quite likely to switch to his own and his audience's native tongue when explaining complex technical concepts, to make sure that difficulties in the use of the second language

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[3] For the dating see Bartholomew Mac Carthy, *Annals of Ulster*, vol. 4 (Dublin, 1901), lxx, and especially Eduard Schwartz, 'Christliche und jüdische Ostertafeln', *Abhandlungen der königlichen Gesellschaft der Wissenschaften zu Göttingen, philologisch-historische Klasse, Band 8, Nr. 6* (Berlin, 1905), 1-195: 91.

[4] Cf. Aldhelm's letter to a certain Eahfrith, in which he relates that his friend studied these three subjects in Ireland (computistics, no doubt, stands behind Aldhelm's reference to geometry and physics): Aldhelm, *Epistola ad Eahfridum* (ed. Rudolf Ehwald, *Aldhelmi opera, Monumenta Germaniae Historica, Auctores Antiquissimi* XV (Berlin, 1919), 486-94: 490-1): *lurconum conglobatio lectorum* […] *ac residua sagax discipulorum caterva florigeris agiographae ex arvis non solum artes grammaticas atque geometricas bisternasque omissas fisicae artis machinas, quin immo allegoricae potiora ac tropologicae disputationis bipertita bis oracula aethralibus opacorum mellita in aenigmatibus problematum siticulose sumentes carpunt.* 'A mass of ravenous scholars and a vivid throng of sagacious students, the residue from the rich fields of Holy Writ, thirstily seize and swallow not only the grammatical and geometrical arts – to say nothing of the twice-three scaffolds of the art of physics – but also, the fourfold honeyed oracles of allegorical or rather tropological disputation of opaque problems in aetherial mysteries' (translated by Michael Lapidge and Michael Herren, *Aldhelm: The prose works* (Cambridge 1979), 161-2).

would not prevent a student from fully understanding the concepts in question. It is quite obvious that such a linguistic switch would have occurred more naturally and frequently in the context of teaching than in written form. Nevertheless, since a computistical textbook had, in the end, the exact same purpose as class-room teaching, namely to provide a teacher of computistics, as well as his students, with a thorough and comprehensive understanding of the reckoning of time, we can reasonably assume that, if the author deemed it appropriate and necessary, he would certainly not have hesitated to switch from Latin to his own and his audience's native tongue for the sake of didactic precision. Indeed, in the above-mentioned article we concluded that such didactic necessities constituted the main reason for code-switching and code-mixing in computistical textbooks.

Subsequently, a previously unknown text of that genre came to light, which we call *Computus Einsidlensis* (*CE*) after its present location, the Benedictine monastery of Einsiedeln in the Swiss Alps.[5] It is preserved in a late-ninth-century manuscript, presumably from Strasbourg or the Lake Constance region;[6] the provenance of the

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[5] The discovery of *CE* was announced by Immo Warntjes in 'A newly-discovered Irish computus: Computus Einsidlensis', in *Peritia* 19, 61-4; although the date of publication is given as 2005, it was actually published well after the discovery of *CE* in early January 2006. Many references in the *Peritia* article itself contain obvious errors, since the printer changed every occurrence of '7' to '9'. Accordingly, the shelfmark of the Einsiedeln MS in question is 321 (647) rather than 321 (649), the period covered by Borst's *Schriften* is AD 721 to 818 rather than AD 921 to 818, in note 3 the page reference is to p. 117 rather than 119, the period between the reception of Isidore and Bede is ca. AD 650 to 750 rather than AD 650 to 950, Iona discarded the *latercus* in AD 716 rather than AD 916, the Munich Computus was composed in AD 719 rather than AD 919, the reference in note 14 is to p. 171 rather than 191; most importantly for the reader of the present article, the Old Irish forms occur on pp. 90, 93, 97, 123 rather than on pp. 90, 93, 99, 123 as printed in note 7 (which itself is misprinted as 9).

[6] Einsiedeln, Stiftsbibliothek, 321 (647), pp. 82-125. For descriptions of this MS see especially Gabriel Meier, *Catalogus codicum manu scriptorum qui in bibliotheca monasterii Einsidlensis O.S.B. servantur* (Leipzig, 1899), 292-4 (10th – 13th century), Anton Bruckner, *Scriptoria Medii Aevi Helvetica, Denkmäler schweizerischer Schreibkunst des Mittelalters,* 14 vols (Geneva, 1935-1978), vol. 5: *Schreibschulen der Diözese Konstanz, Stift Einsiedeln, Kirchen und Klöster der Kantone Uri, Schwyz, Glarus, Zug* (Geneva, 1943), 24 (Alsace, possibly Strasbourg, 9th -10th century), Bernhard Bischoff, *Katalog der festländischen Handschriften des neunten Jahrhunderts,* 2 vols (Wiesbaden, 1998, 2004), vol. 1, 242 (**'**Bodenseegebiet (?), IX. Jh., (2./)3. Drittel (ca. 874?)'), Arno Borst, *Der karolingische Reichskalender und seine Überlieferung bis ins 12. Jahrhundert*, 3 vols (Hannover, 2001), 152-3, idem, *Schriften zur Komputistik im Frankenreich von 721 bis 818*, 3 vols (Hannover, 2006), 227-8 (Strasbourg, last third of ninth century), Hartmut Hoffmann, *Schreibschulen des 10. und*

text, however, is undoubtedly Irish.[7] The main argument for this is the fact that a considerable number of Old Irish terms and phrases is incorporated in the main body of the text: as in the case of the Munich Computus, the Old Irish terminology appears as part of the main text proper, rather than in the form of glosses or commentaries. Moreover, the context makes it clear that we can reject the theoretical possibility that these Old Irish terms might originally have been glosses which crept into the text at a later copying stage. As far as code-switching and code-mixing from Latin to Old Irish in computistical texts are concerned, the importance of *CE* is unmistakable: the discovery of a second text containing several examples of this phenomenon indicates that the occasional use of Old Irish was not due to the predilection of a single author (the Munich computist). Before the discovery of *CE*, only two Irish computistical textbooks from the post-Isidorian, pre-Bedan period were known, namely the Munich Computus and *De ratione conputandi*.[8] Now, since Isidore is the latest securely datable source used by the Einsiedeln computist, and since no trace of Bede's influential *De temporum ratione* can be found therein, *CE* can be added to these. Of the three Irish computistical textbooks composed in the period *ca*. AD 650-750, two contain a considerable amount of Old Irish material. This appears to allow for the general statement that code-switching and code-mixing from Latin to Old Irish was widespread in the Irish computistical milieu of the period, in writing and even more so in class-room teaching.

Yet, an analysis of this phenomenon in *CE* does not lead to new conclusions concerning the context of and the reasons for code-switching and -mixing from Latin to Old Irish in computistical literature. In fact, all the conclusions drawn by us from the rather limited number of instances found in the Munich Computus are fully vindicated by the more substantial evidence of *CE*. Indeed, every time Old Irish is used in this text, it is to serve a specific didactic purpose.

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des 11. Jahrhunderts im Südwesten des Deutschen Reiches, 2 vols (Hannover, 2004), vol. 1, 120-2 (the relevant part of the manuscript is dated to the ninth century, but no provenance is given).

[7] Cf. Warntjes, 'Computus Einsidlensis', 62-3.

[8] Munich Computus: München, Bayerische Staatsbibliothek, Clm 14456, fol. 8r-46r (an edition and translation of this text has been completed as part of a NUI Galway PhD thesis by Immo Warntjes, and will appear in print in due course). *De ratione conputandi* is edited by Dáibhí Ó Cróinín in Maura Walsh and Dáibhí Ó Cróinín, *Cummian's letter De controversia paschali and the De ratione conputandi* (Toronto, 1988), 99-229.

The Old Irish forms preserved in *CE* are, however, extremely interesting when considered from a different perspective. The precise dating of much of the Old Irish linguistic material preserved in contemporary or near-contemporary manuscripts is a well-known problem. Even though the relative chronology of the most important collections of glosses (Würzburg (Wb.), Milan (Ml.) and St Gall (Sg.)) is comparatively unproblematic (at least as far as Wb. and Ml. are concerned),[9] their absolute dating, on the other hand, is essentially conjectural,[10] and the same generally applies to the scarce Early Old Irish[11] material that has come down to us; for instance, although it is quite clear that the Cambrai Homily was written at some point in the seventh century, no absolute date can be ascribed to this most important witness for that linguistic phase.[12]

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[9] While it is clear that the Wb. glosses are older than Ml., the situation is less apparent for Sg.; cf. *Thes* II, xxiii: '[…] the codex [*Sangallensis* 904] was probably written about the middle of the ninth century. The date of the Irish glosses has been much disputed; sometimes they have been considered earlier, sometimes later than Ml., and opinions have varied according as attention has been directed to one point or another. The explanation of the fluctuation of opinion is that the collection of glosses is not homogeneous, but comes from various sources and is of varying antiquity').

[10] Cf., e.g., Rudolf Thurneysen, 'Das Alter der Würzburger Glossen', *ZCP* 3 (1901), 47-54: 47-48; *Thes* I, xviii, xxiii-xxv; Julius Pokorny, 'Über das Alter der Würzburger Glossen', *ZCP* 10 (1915), 36. The Ml. glosses are generally dated to *ca.* AD 800 on the basis of the fact that their language appears to be later than that of Wb. (cf. previous note), and close to that of the *Félire Óengusso* (composed between AD 797 and 808; cf. *GOI* § 8).

[11] The term Early Old Irish (EOIr) will here be applied to the phase of the language extending from the approximately mid-sixth-century syncope to *ca.* AD 700 (cf. Kim McCone, 'An tSean-Ghaeilge agus a Réamhstair', in Kim McCone, Damian McManus, Cathal Ó Háinle, Nicholas Williams and Liam Breatnach (eds), *Stair na Gaeilge in ómós do Phádraig Ó Fiannachta* (Maynooth, 1994; hereafter cited as *SnaG*), 61-219: §§ 1.2, 1.6; idem, *Towards a relative chronology of Ancient and Medieval Celtic sound change* (Maynooth, 1996), 127. Other terms used here are: Archaic Irish (AIr; between apocope and syncope); Primitive Irish (PIr; before apocope); Insular Celtic (IC); Common Celtic (CC).

[12] Cf. *Thes* II, xxvi: 'The Irish is very archaic, and dates from the second half of the seventh or the beginning of the eighth century'. More recently, however, Pádraig Ó Néill has pointed out that 'internal evidence, in the form of the passages borrowed from Gregory's *Homilia*, gives at least a *terminus post quem* of *c.* A.D. 600. How soon after being written down, Gregory's homilies reached Ireland is difficult to say' ('The Background to the *Cambrai Homily*', *Ériu* 32 (1981), 137-148: 147). As for the other major source for Early Old Irish, the *prima manus* of Wb., it was conjecturally dated by Thurneysen to *ca.* AD 700 (cf. Thurneysen, 'Das Alter', 51); this dating was generally accepted and confirmed by subsequent scholars (cf. e.g. K.H. Schmidt, 'Die Würzburger Glossen', *ZCP* 39 (1982),

In the case of *CE* (and even more so in the case of the Munich Computus) we are in a fundamentally different and particularly fortunate position, as this text can be dated with certainty to the period AD 650-750 by analysing the sources used for its composition. This time-span, as will be shown below, can be further narrowed down on computistical grounds to the period *ca*. AD 689 to 719. For this reason, a study of the Irish forms found in *CE* can provide us with precious information on the absolute chronology of some of the changes which occurred between two distinct phases of Old Irish, as this text was composed at the time generally considered by scholars as the period of transition between what is defined as Early and Classical Old Irish.

The present article will accordingly be divided into two main sections: firstly, the date of composition of *CE* will be set on a solid footing by analysing extra-linguistic (i.e. computistical) dating criteria, and secondly, the result of that analysis will be taken as a basis for a precise chronological placement of the Irish forms found in the text, which will be edited and discussed in detail, with special reference to the implications for our understanding of the transitional phase between Early and Classical Old Irish.

2. THE DATE OF THE *COMPUTUS EINSIDLENSIS*

As has already been mentioned, analysis of the sources used by the Einsiedeln computist reveals that this text was certainly composed in the period between the reception of Isidore and the reception of Bede's computistical texts in the *regiones Scottorum* (as Bede defined the area inhabited by the Irish, covering the whole island of Ireland and the western part of modern day Scotland), i.e. roughly between *ca*. AD 650 and 750.[13] The question remains whether a more precise date can be assigned to

54-77: 64-8; Pádraig Ó Néill, 'The Old-Irish glosses of the *prima manus* in Würzburg, m.p.th.f.12: text and context reconsidered', in Michael Richter and Jean-Michel Picard (eds), *Ogma: Essays in Celtic Studies in Honour of Próinséas Ní Chatháin* (Dublin, 2002), 230-42: 230, 232).

[13] The date of the reception of Isidore in Ireland is disputed; AD 650 is considered as the earliest possible date, and this is followed here (see especially Michael Herren: 'On the earliest Irish acquaintance with Isidore of Seville', in Edward James (ed), *Visigothic Spain: new approaches* (Oxford, 1980), 243-50, repr. in Michael Herren, *Latin letters in early Christian Ireland* (Aldershot, 1996), article III). In the end, the chronological placement of the reception of Isidore in Ireland depends very much on the dating of the Irish computistical texts under discussion here. The date of the

this text. Generally speaking, due to their technical nature, one of the great advantages of computistical texts is that they quite often incorporate a dating clause, in which the author uses his *annus praesens* as an example to illustrate a mode of calendrical calculation. Unfortunately, this is not the case with the Einsiedeln text. Only two calculations are executed in detail. The first deals with calculating the Julian calendar date of Easter Sunday from the day of the week on which 1 January falls, and of the Julian calendar date of the Easter full moon (the day of the week on which the Easter full moon falls is calculated from the day of the week on which 1 January falls; Easter Sunday, then, falls on the following Sunday); this calculation is applied to five successive years.[14] The chronological data used here, however, immediately suggest that these examples are theoretical rather than based on the *annus praesens* of the author: in the five consecutive years, the weekdays on 1 January follow the pattern *feria* 1, 2, 3, 4 and then 6 ('leaping' over 5 due to the insertion of a bissextile day in the fourth year), while the lunar information matches the first five years of the Dionysiac 19-year cycle; these two sequences of week-day and lunar data respectively would certainly have been the most obvious choices for a theoretical construction. This hypothesis is further confirmed by the Einsiedeln computist's own words: he specifies that the outlined calculations are mere examples, not connected to specific years, adding that, nonetheless, the method may be easily applied to the *annus praesens* of the reader.[15] The second calculation deals with the relationship between the lunar age of Easter Sunday and that of the Sunday six weeks (42 days) earlier, which marked the beginning of the Lenten fast (*initium quadragesimae*).[16] Since the lunar month ending within this period of six weeks always consisted of 30 days, the lunar day difference between these two Sundays was $42 - 30 = 12$ days. There were only two exceptions to this rule, namely the years in which (a) the lunar bissextile day

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reception of Bede's computistical works is equally difficult to establish; AD 750, that is 25 years after the composition of *De temporum ratione*, only serves as a rough guide here.

[14] Einsiedeln, Stiftsbibliothek, 321 (647), p. 112.

[15] Einsiedeln, Stiftsbibliothek, 321 (647), p. 112: *Hęc autem exempli causa ostendimus. Sed si quis in decennouenali ciclo huius numeri ueritatem cognoscere uoluerit, presenti sibi anno indesinenter inuestiget.* 'We have presented this as an example. But if anyone wants to know the truth [concerning Easter Sunday] of his year in the 19-year cycle, let him constantly investigate it in the year in which he finds himself'. Cf. also p. **[??]** below.

[16] Einsiedeln, Stiftsbibliothek, 321 (647), p. 120-121.

(on 24 February) or (b) the *saltus lunae* (on 22 March) fell within this period. In case (a) an extra day was added to the lunation ending in the Lenten period, while in case (b) one lunar day was subtracted, leading to a lunar day difference between the two Sundays in question of (a) 42 – 31 = 11 days, and (b) 42 – 29 = 13 days. By way of illustration, the Einsiedeln computist gives one example each of the interference with the quadragesimal period of the bissextile day on the one hand, and the *saltus lunae* on the other. The essential chronological data given in the first example are: *feria* 1, *luna* 16 on 1 January of a bissextile year; the essential data of the second example are: *feria* 4, *luna* 8 on 1 January of a non-bissextile year. These chronological details reveal that the reckoning underlying these calculations is the Dionysiac one. In the period between the introduction of the Dionysiac reckoning (AD 525) and the second half of the ninth century (i.e. the time of writing of the MS incorporating *CE*), only the year AD 568 agrees with the data outlined in the first example.[17] As for the second example, its data match the next occurrence of a *saltus lunae*, namely AD 570. In the second half of the sixth century, however, the Dionysiac reckoning was certainly not accepted in any part of the *regiones Scottorum*,[18] and presumably it was not even known. For this reason, it must be concluded that the Einsiedeln computist copied an earlier example from an unknown source.

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[17] In Warntjes, 'Computus Einsidlensis', 62, it was considered possible that AD 663 was the year in question, for the following reasons: in the period in which the *Computus Einsidlensis* was composed, i.e. *ca*. AD 650-750, only one year has the chronological data of *feria* 1 and *luna* 16 on 1 January, that is AD 663; however, this year was not bissextile. It was assumed, therefore, that the author of *CE* may have taken his own *annus praesens* as an example, and constructed the hypothetical impact of a bissextile day on chronological calculations within that year, had a bissextile day occurred. It now appears more likely that the Einsiedeln computist copied this specific example from an earlier source.

[18] At this time, the *latercus* (i.e. the 84-year Easter reckoning with 14-year *saltus*) was universally followed in the *regiones Scottorum*. Only by AD 632 did this situation change, when the southern Irish looked to Rome for guidance in the question of the canonical Easter. The result was that they abandoned the *latercus*, but even then the reckoning accepted by them was the Victorian rather than the Dionysiac one. This fact was recorded by Cummian, who stated that the reckoning adopted by the Southern Irish consisted of a 532-year table and had lunar limits of 16 to 22 for Easter Sunday, both being characteristic features of the Victorian reckoning (*Epistola Cummiani*, ll. 10-11, 75-85 (Walsh and Ó Cróinín, *Cummian's letter*, 56, 66-8); the Dionysiac Easter table and its earliest continuations consisted of 95-years and had lunar limits of 15 to 21 for Easter Sunday). The Dionysiac reckoning, for its part, was only slowly adopted in the late seventh / early eighth century.

Consequently, the calendrical calculations outlined in *CE* do not provide any evidence for its date of composition: for this reason, an exact year of composition cannot be established. Nevertheless, internal evidence certainly allows for a more precise dating than the initial ca. AD 650 to 750. Of the three Irish computistical textbooks composed in this period, only one can be dated with absolute certainty: the Munich Computus contains chronological details for Easter of the 'imminent year' that agree with AD 719.[19] Now, *CE* is closely related to this datable text. In fact, the analogies between the two texts, especially in terms of technical concepts and methods, are too many to be discussed here.[20] Textual parallels, on the other hand, are far less frequent; this is due to the fact that, even though seventh- and eighth-century computists copied many ideas from their sources, they preferred to reformulate them in their own words. Nonetheless, several textual parallels between *CE* and the Munich Computus can be found. The following examples will serve as an illustration of the interdependency of the two texts:

München, Bayerische Staatsbibliothek, Clm 14456, fol. 11r:	Einsiedeln, Stiftsbibliothek, 321 (647), p. 91:
Vesperum ... . Unde haec stella a maioribus Romam appetentibus uesperum uocata est, quae noctis initium trans Hesperiam oriebatur. Itaque Isperia ab Espero rege dicta, quę nunc Italia ab Italo duce dicitur.	*Vesperum quidam cum adspiratione hesperum dicunt a prouintia Hesperea, que ab Hespero Romanorum duce nomen sortita est. Hesperus ab Hesperea ciuitate, quam construxit Hespera filia Romuli. Tale uero nomen quod est Hesperus Macedonii appellauerunt, eo quod eis a Macedonia ad Ęgyptum nauigantibus haec stella oriebatur trans Hesperiam, quae nunc Italia ab Italo Siculorum rege nominata est.*
München, Bayerische Staatsbibliothek, Clm 14456, fol. 11v:	**Einsiedeln, Stiftsbibliothek, 321 (647), p. 92:**
Feria a fando dicta est, uel a fiendo, dicente Domino: Fiat lux et facta est lux.	*Feria a fando dicta est, quasi faria, hoc est opera VII dierum fando. Aliter feria a fiendo dicta est, eo quod dixit Deus: Fiat lux et reliqua.*
München, Bayerische Staatsbibliothek, Clm 14456, fol. 12v:	**Einsiedeln, Stiftsbibliothek, 321 (647), p. 93:**
Hii sunt menses Latinorum: Ianuarius, Februarius, Martius, Aprilis, Maius, Iunius, Iulius, Augustus, Septimber, Octimber, Nouimber, Decimber. Nomina mensuum IIII rebus assumpta sunt: A diis, a regibus, a numeris, a rebus.	*Quibus modis menses uocabula sumpserunt? Hoc est a quattuor: a diis et regibus, a rebus et numeris. Quot menses sunt anni? Hoc est XII: Ianuarius, Februarius, Martius, Aprilis, Maius, Iunius, Iulius, Augustus, Septimber, Octimber, Nouimber, Decimber.*
München, Bayerische Staatsbibliothek, Clm 14456, fol. 15r:	**Einsiedeln, Stiftsbibliothek, 321 (647), p. 95:**
Quot sunt principales dies de nominibus dierum mensium? Id est III: Kalende, Nonae et Idus.	*Quod sunt principales dies, quibus menses conputantur? II uel III, id est Kalendę, Nonę, Idus.*

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[19] München, Bayerische Staatsbibliothek, Clm 14456, fol. 32v-33r. Cf. references in note 2.

[20] A detailed account of these parallels in technical concepts and methodologies will be provided in the introduction to the forthcoming edition of the Munich Computus.

The Munich Computus can be precisely dated, and, as the Munich and the Einsiedeln texts are clearly interdependent, we can then date the latter, once the direction of influence is established. If (a) the Munich Computus can be shown to be based on *CE*, then the latter must pre-date AD 719; if, on the other hand, (b) *CE* can be shown to rely on the Munich Computus, then the Einsiedeln text must post-date AD 719.

Three passages in particular suggest that (a) was the case, i.e. that *CE* was one of the Munich computist's sources (and, in fact, his principal source).[21]

(1) In the description of one specific method for the calculation of Easter Sunday, the Einsiedeln computist illustrates the modes of calculation by means of invented examples, which are then followed by the statement cited and translated in footnote 15 above.

Now, the fact that the Munich Computus is the only other known computistical text that uses the exact same method for calculating Easter Sunday is a strong argument for the interdependency of these two texts. The Munich computist, however, does not outline the same examples as his Einsiedeln counterpart. On the contrary, he discusses three rather than five successive years, referring to the first of these as the 'imminent year' (which, as we have seen, corresponds to AD 719).[22] It appears, therefore, that the Munich computist directly followed the Einsiedeln computist's suggestion of applying the calculation not just to any hypothetical example, but rather to his own *annus praesens*.

(2) The second passage to be discussed here deals with a curious feature of early-eighth-century Irish computistics, namely the equation of the two terms *quadrans* and *dodrans*. In Classical Latin, these two terms are complementary, and not identical, *quadrans* defining a quarter and *dodrans* three quarters, adding up to one when combined. The Anglo-Saxon scholar Bede, contemporary of both the Einsiedeln and the Munich computist, was aware of these Classical definitions, as were computists

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[21] Again, a more detailed account will be given in the introduction to the forthcoming edition of the Munich Computus.

[22] München, Bayerische Staatsbibliothek, Clm 14456, fol. 32v-33r. For the dating clause cf. note 2 above.

and mathematicians before and after him.[23] Only Irish or Irish-influenced texts of the early eighth century (including the Munich Computus), misinterpreted *dodrans* and equated it with *quadrans*.[24] But where did this mistake originate? It is certainly noteworthy that the only Irish text which does not have this mistaken equation is *CE*. In fact, it is quite apparent that this error arose from a misreading of a passage in the Einsiedeln text itself.

When discussing the characteristics of a quarter of a day, the Einsiedeln computist makes the following statement:

> *Quadrans, quo sensu hoc nomen intellegitur? Aut dubium, quod III significationes dicitur, hoc est: quadras, ut dicitur gigas, gigantis; et quadrans*

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[23] See Bede's *De temporum ratione*, chap. 4 (ed. Charles W. Jones, *Bedae Venerabilis opera, pars VI: opera didascalia, Corpus Christianorum Series Latina* 123B (Turnhout, 1977), 281: *Si in quattuor, quarta pars quadrantis nomen; residuae tres dodrantis accipiunt* ('If into four, the fourth part is called *quadrans*; the residual three take the name of *dodrans*'; translated by Faith Wallis, *Bede: The reckoning of time* (Liverpool, 1999), 17). Cf. also, e.g., Hrabanus Maurus's early ninth century *De computo*, chap. 18 (Wesley M. Stevens, *Rabani Mauri De computo, Corpus Christianorum Continuatio Mediaevalis* 44 (Turnhout, 1979), 222): *D. Quadrans autem, quid est? M. Quadrans siue quadras est quarta pars ... Tres uero reliquas dodrantem appellare debebis* ('Pupil: But what is a *quadrans*? Teacher: A *quadrans* or *quadras* is a fourth part … You should call the remaining three *dodrans*'); Helperic's early-tenth-century *De computo*, chap. 1 (*Patrologia Latina*, ed. J.P. Migne (221 vols, Paris 1844–64), vol. 137, col. 21): *Si quadrans quid sit dilucide nosse desideras, scito quia quidquid in quatuor aequas partes divideris, unaquaeque earum quadrans, tres autem reliquae nominantur dodrans* ('If you want to know precisely what a *quadrans* is, you will have to understand that whatever you divide into four equal parts, any single one of them is a *quadrans*, the remaining three [taken together], however, are called *dodrans*').

[24] See München, Bayerische Staatsbibliothek, Clm 14456, fol. 9v (which is directly copied in the Angers glosses to Bede's *De temporum ratione*: Angers, Bibliothèque Municipale, 477, fol. 49v): *Quadrans Latine, Grece autem dodras, Hebraicę quodras* ('*Quadrans* in Latin, *dodras* in Greek, *quodras* in Hebrew'). *De ratione conputandi*, ch. 21 (Walsh and Ó Cróinín, *Cummian's letter*, 129): *Isidorus dicit: Quadras quartam unciae habet partem, quam Ebrei quasi quodrantem, Greci dodrantem, Latini quadrantem uocant* ('Isidore states: A *quadras* contains the fourth part of an *uncial*, which the Hebrews call *quodrans*, the Greeks *dodrans*, the Latins *quadrans*'). *De divisionibus temporum*, ch. 7 (*Patrologia Latina*, vol. 90, col. 655): *quem Hebraei quadrantem, Graeci vero dodrantem, Latini quadrantem vocant* ('which the Hebrews call *quadrans*, the Greeks *dodrans*, the Latins *quadrans*'). Bobbio Computus, ch. 97 (*Patrologia Latina*, vol. 129, col. 1319): *Quadrans dicitur, eo quod quartam partem diei suspendit, quem Ebrei quadrantem, Greci dodrantem, Latini quadrantem uocant* ('It is called *quadrans*, since it constitutes the fourth part of a day, which the Hebrews call *quadrans*, the Greeks *dodrans*, the Latins *quadrans*').

participium a uerbo quadro, et nomen est quadrans; Grece autem integritas doras uel dodras, dodrantis.

'In what sense is the term *quadrans* to be understood? There is no doubt that it is so called according to three meanings: *quadras*, in the same way as *gigas*, *gigantis* is termed; *quadrans* is the participle of the verb 'to quarter' (*quadro*), and the noun is *quadrans*; in Greek, moreover, 'integrity' is called *doras* or *dodras*, *dodrantis*.'[25]

The last of the three explanations for the word *quadrans* provided here by the Einsiedeln computist reflects the theory according to which *quadrans* would ultimately have been a Greek term, to be inflected in the same way as *doras* or *dodras*, gen. *dodrantis*, the Greek term for Latin *integritas*. This idea, then, was apparently misunderstood to the effect that *dodras* was considered as the Greek term for Latin *quadrans*. Since no other text, to our present knowledge, is as close to *CE* as the Munich Computus, it seems reasonable to assume that the mistaken equation of *quadrans* with *dodrans* originated from the Munich computist's misinterpretation / misreading of the Einsiedeln text; at least it appears to have been introduced after the composition of *CE* and before or with that of the Munich Computus.

(3) The third passage in question also involves a mistake, this time arising from ignorance of the technical construction of the *latercus*. When discussing the *initium quadragesimae*, the beginning of the Lenten fast, the Einsiedeln computist compares the evidence of all three Easter reckonings which were used in the *regiones Scottorum* at different periods of time, namely the Dionysiac (clearly the one favoured by the Einsiedeln computist), the Victorian and the *latercus*, i.e. the 84 (14)-year Easter reckoning.[26] Here the computist's interest lay in the establishment of the lunar limits of the *initium quadragesimae*. Since the beginning of Lent (set on the sixth Sunday before Easter) was directly dependent on Easter Sunday, he calculated the lunar limits of the *initium quadragesimae* relative to those of Easter Sunday. The three reckonings' lunar limits for Easter Sunday were well known as *luna* 15 to 21 (Dionysiac), *luna* 16 to 22 (Victorian), and *luna* 14 to 20 (*latercus*). From these data, the Einsiedeln computist deduced the lunar limits for the *initium quadragesimae* as *luna* 3 to 9, *luna* 4 to 10, and *luna* 2 to 8 respectively. Parallel passages presenting the same results can be found in both the Munich Computus and *De ratione conputandi*.[27]

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[25] Einsiedeln, Stiftsbibliothek, 321 (647), p. 89.

[26] Einsiedeln, Stiftsbibliothek, 321 (647), p. 119.

[27] Cf. p. **[??]** below.

Now, the interesting aspect of this calculation lies in the fact that it contains an obvious error in the *latercus* data. Whoever composed this passage was not aware of the fact that the *latercus* applied a sequence of lunations different from the alternating one used in the Dionysiac and Victorian reckonings.[28] This difference had serious implications for the lunar relation between Easter Sunday and the *initium quadragesimae*, since the lunation that ends within this interval, namely the March lunation, is hollow (i.e. it consists of only 29 days) in the *latercus*'s sequence, but full (i.e. it consists of 30 days) according to the alternating sequence applied in the Dionysiac and Victorian reckonings. Since the *initium quadragesimae* was generally accepted to be placed exactly six weeks (i.e. 42 days) before Easter Sunday, this led to a lunar day difference of 12 days between the two Sundays in the Victorian and the Dionysiac reckoning (42 - 30 = 12), but of 13 days according to the *latercus* (42 - 29 = 13). Consequently, the mistake made in the passage in question is that 12 was subtracted from the lunar age of Easter Sunday in order to calculate the lunar age of the *initium quadragesimae* not only for the Dionysiac and the Victorian reckonings, but also for the *latercus*, whereas in that case 13 should have been subtracted, resulting in *luna* 1 to 7 as the lunar limits for the *initium quadragesimae* of the *latercus*.[29] The fact that this mistake occurs in all three Irish computistical textbooks (and in no other text) is another striking indication of their interdependency.

Is it then possible to establish which of the three computists first introduced this error? It is noteworthy that this wrong datum is actually treated as an established fact in both the Munich Computus and *De ratione conputandi*, which gives the impression that the data were copied from an authoritative text, with no need being felt for any further comment. The Einsiedeln computist, on the other hand, expresses some doubts

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[28] For a more detailed discussion of the implications of this difference on the *initium* lunar data of the *latercus* see Immo Warntjes, 'The Munich Computus and the 84 (14)-year Easter reckoning', *Proceedings of the Royal Irish Academy* 107C (2007), 31-85: 51-4.

[29] Note, however, that the only extant Easter table of this reckoning lists lunar limits for the *initium quadragesimae* ranging between *luna* 4 and 10; cf. the facsimile of the table in Warntjes, '84 (14)-year Easter reckoning', 80-82, the edition in Daniel McCarthy, 'Easter principles and a fifth-century lunar cycle used in the British Isles', *Journal for the history of astronomy* 24 (1993), 204-24: 218-9, and the translation in Bonnie Blackburn and Leofranc Holford-Strevens, *The Oxford companion to the year* (Oxford, 1999), 873-5. This is due to the fact that in the *latercus* the *initium quadragesimae* ('the beginning of the forty-day period) was placed on the Wednesday exactly forty days before Easter Sunday reckoned inclusively; cf. Warntjes, '84 (14)-year Easter reckoning', 54.

about the correctness of his own statements. In fact, his phrasing strongly suggests that he was the author of the above-mentioned construction and, as a consequence, of the mistake too.

The relevant passage as it appears in the three texts is (the crucial phrases of *CE* are highlighted in boldface):

Einsiedeln, Stiftsbibliothek, 321 (647), p. 119:	München, Bayerische Staatsbibliothek, Clm 14456, fol. 33v:	*De ratione conputandi*, ch. 99 (Walsh and Ó Cróinín, *Cummian's letter*, 204-5):
De paschae figuris. Quot sunt figurę paschę? III sunt: A XIIII luna in XXmam secundum latercum, a XVmam (!) luna in XX\I/ secundum Grecos, a XVI luna in XXIIdam secundum Romanos. **Dum autem pro certo nouimus has III formas in pascha esse, aeque III formas in initio fieri oppinamur. Et hoc uerum esse fatemur**, *hoc est secundum latercum initium fit a IIda luna VIIIuam lunam, secundum Grecum (!) a III luna in IXnam lunam, secundum Romanos a IIII luna in X lunam.*	*Septem aetates paschae, quas prediximus, hae sunt: Secundum Grecos a XV luna usque in XXI, initii uero a III singulari in VIIII extenduntur. Secundum autem Victorium aetates pasche a XVI luna in XXII, initii a IIII singulari in Xam. Iuxta uero latercum a XIIII luna in XX, et initii a II luna in VIII singularem.*	*Sciendum nobis quod, quemadmodum hi uiri in septem paschae aetatibus discrepant, <in septem aetatibus initii idcirco discrepant>. Laterci enim sectatores, qui <a> XIIII luna usque ad XX septem aetates paschae numerant, a II luna usque ad VIII lunam septem aetates inítii conputant. Latini uero, septem aetates paschae a XVI luna usque ad XXII conputantes, a IIII luna usque in X lunam septem initii aetates numerant. Greci uero rationalibus, quos nos sequimur, a XV luna usque in XXI lunam septem aetates paschae numerantes, a III luna usque in VIIII lunam septem aetates initii conputant.*

After having introduced the lunar limits for Easter Sunday according to the three reckonings, the Einsiedeln computist states that he knows for certain (*pro certo*) that these are correct. When he comes to the three lunar limits of the *initium quadragesimae*, however, he appears to be more hesitant: he argues that he believes (*oppinamur*) them to be 'in like manner' (*aeque*), and that therefore he can grant the three lunar limits outlined in the remaining part of this passage to be accurate (*et hoc uerum esse fatemur*). The author's attitude indicates that he worked from a source which provided him only with the details of the lunar limits for Easter Sunday, from which he himself had to deduce the lunar limits for the *initium quadragesimae*. Accordingly, he quite outspokenly admitted that he was not entirely sure whether the method applied by him was actually valid and**,** consequently**,** whether the data given by him were correct for each of the three reckonings. Yet, even though these doubts were entirely justified, they were not repeated in the subsequent texts, i.e. the Munich Computus and *De ratione conputandi*, since their authors relied on the authority of the *Computus Einsidlensis* for this passage.

It is clear from the above that the Munich computist worked directly from *CE*, and this provides a *terminus ante quem* of AD 719 for the composition of the Einsiedeln text. Another passage of the *Computus Einsidlensis* can help us date the text more precisely. At the end of his discussion of the bissextile day, the Einsiedeln computist gives a curious mathematical explanation for this technical device:[30] if the 8760 hours of the 365 days forming one year (with exclusion of the bissextile increment itself) are divided by the seven weekdays, this division results in a remainder of three hours, which constitute the bissextile increment per year (the bissextile day being reckoned as consisting of the 12 hours of daytime). For present purposes, the interesting aspect of this explanation is not its strange argumentation, but the ascription to a certain Theodore. This name is as rare in computistical literature as in the more general early medieval, and more specifically seventh- and early-eighth-century Insular context. If this reference properly belongs to the Insular context rather than being a remnant of older computistical literature, the name that immediately springs to mind is Theodore of Tharsus, archbishop of Canterbury from AD 669 to 690. Bede specifically mentions that Theodore taught astronomy and ecclesiastical computation, i.e. the basics of computistics, and it must be presumed that the fame of the Canterbury school also attracted many Irishmen.[31] Consequently, the historical context certainly

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[30] Einsiedeln, Stiftsbibliothek, 321 (647), p. 108.

[31] For the subjects taught at the school of Canterbury see especially Bede, *Historia ecclesiastica gentis Anglorum* IV 2 (Charles Plummer, *Venerabilis Baedae opera historica, 2 vols* (Oxford, 1896), vol. 1, 204-5): *Et quia litteris sacris simul et saecularibus, ut diximus, abundanter ambo erant instructi, congregata discipulorum caterua, scientiae salutaris cotidie flumina inrigandis eorum cordibus emanabant; ita ut etiam metricae artis, astronomiae, et arithmeticae ecclesiasticae disciplinam inter sacrorum apicum uolumina suis auditoribus contraderent* ('And because both of them were extremely learned in sacred and secular literature, they attracted a crowd of students into whose minds they daily poured the streams of wholesome learning. They gave their hearers instruction not only in the books of holy Scripture but also in the art of metre, astronomy, and ecclesiastical computation'; translated by Bertram Colgrave in Bertram Colgrave and R.A.B. Mynors: *Bede's Ecclesiastical History of the English people* (Oxford, 1969, repr. Oxford, 1998), 333-5). For Irishmen studying under Theodore, see especially Aldhelm, *Epistola ad Eahfridum* (Ehwald, *Aldhelmi opera,* 493): *etiamsi [beatae memoriae] Theodorus summi sacerdotii gubernacula regens Hiberniensium globo discipulorum, ceu aper truculentus molosorum catasta rigente vallatus, stipetur, limato perniciter grammatico dente iactura dispendii carens rebelles falanges discutit* ('although Theodore who pilots the helm of the high priesthood, be hemmed in by a mass of Irish students, like a savage wild boar checked by a snarling pack of hounds, with the filed tooth of the grammarian – nimbly and with no loss of time – he disbands

justifies the identification of a Theodore mentioned in an Irish computistical texts belonging to the pre-AD 719 period with the archbishop of Canterbury. This identification is further supported by passages of identical content found in other contemporary computistical texts, and most notably in the Munich Computus: here, this technical explanation of the annual bissextile increment occurs in exactly the same place as in *CE*, namely at the end of the chapter on the bissextile day.[32] Now, the main difference between the Munich Computus and *CE* lies in the fact that the Munich computist does not attribute it to any specific individual, but more generally to the Greeks.[33] Since, as we have already established, the Munich computist worked directly from *CE*, we must conclude that he regarded the Theodore in question as a representative of the 'Greeks' to which he refers. This connection agrees very well with the identification of the Theodore mentioned in *CE* with the archbishop of Canterbury, who was Byzantine by birth as well as in his scholarly training.

This identification, then, points to AD 669 (the beginning of Theodore's episcopacy) as the *terminus post quem* for the composition of *CE*. In fact, the earliest datable occurrence of the above-mentioned curious explanation of the annual bissextile increment, attributed to Theodore in the Einsiedeln text, can be found as

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the rebel phalanxes'; translated by Lapidge and Herren, *Aldhelm: The prose works*, 163). For Irishmen being attracted to Theodore's school and the subjects taught there see Michael Lapidge, 'Theodoros', 636; William Stubbs, 'Theodorus of Tharsus', in William Smith and Henry Wace (eds): *A dictionary of Christian biography, literature, sects and doctrines during the first eight centuries, 4 vols* (London, 1877–88), vol. 4, 926-32: 931; Frank Stenton, *Anglo-Saxon England* (Oxford, 1943, repr. Oxford, 2001), 180-1. For Theodore's teaching, cf. Michael Lapidge, 'Theodore', in Michael Lapidge, John Blair, Simon Keynes and Donald Scragg (eds.), *The Blackwell encyclopaedia of Anglo-Saxon England* (Oxford, 1999), 444-6; Michael Lapidge, 'The School of Theodore and Hadrian', in *Anglo-Saxon England* 15 (1986), 45-72, repr. in idem, *Anglo-Latin literature 600-899* (London, 1996), 141-68: 148-9; J.W. Wallace-Hadrill: *Bede's Ecclesiastical History of the English people, A historical commentary* (Oxford 1988, repr. 2001), 138.

[32] München, Bayerische Staatsbibliothek, Clm 14456, fol. 22v-23r.

[33] The theory in question is introduced by the following words in the Munich Computus (München, Bayerische Staatsbibliothek, Clm 14456, fol. 22v): *Aliter Grecorum bissextus preparari artificiose intellegitur. Greci autem anni horas rimari sollicitant.* 'The bissextile day of the Greeks is known to be skilfully prepared in a different manner. The Greeks moreover require that the hours of a year be reckoned'.

part of the pseudo-Dionysiac *Argumentum XVI* in the *Computus Digbaeanus* of AD 675.[34] Yet, *CE* must not necessarily have been composed in Theodore's lifetime.

Another important clue for the dating of *CE* may be provided by the now lost Victorian Computus of AD 689, which was one of the sources used by the Munich computist.[35] On the whole, it seems reasonable to suppose that this Victorian text, *CE* and the Munich Computus were composed in a relatively close geographical proximity; at least, it can be argued with some confidence that all three of them were written in an area of the *regiones Scottorum* which, at some stage, had followed the Victorian reckoning, i.e. in the southern part of Ireland. We may reasonably infer that the conversion to the Dionysiac reckoning (i.e. the one favoured by both the Einsiedeln and the Munich computist) had not yet taken place at the time of composition of the Victorian Computus, that is AD 689. On this basis, the most likely date of composition of *CE* is in the period between AD 689 and 719.

3. THE IRISH MATERIAL

SECTION 1 (Einsiedeln, Stiftsbibliothek, 321 (647), p. 90, ll. 1–5)

CE is essentially divided into two main parts, the first dealing with the divisions of time and the solar calendar, and the second with the lunar calendar and the calculation of the date of Easter.[36] The divisions of time are discussed in the following order in the first part: a moment (*momentum*), a minute (*minutum*), a point (*punctum*), an hour (*hora*), a quarter of a day (*quadrans*), a day (*dies*), a week (*septimana/ebdomada*), a month (*mensis*), a season (*tempus*), and a year (*annus*). The discussion of the structure

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[34] Bruno Krusch, 'Studien zur christlich-mittelalterlichen Chronologie. Die Entstehung unserer heutigen Zeitrechnung', *Abhandlungen der preußischen Akademie der Wissenschaften, Jahrgang 1937, philosophisch-historische Klasse, Nr. 8* (Berlin, 1938), 80-1. Since the core of the *Computus Digbaeanus* of AD 675 is based on the original Dionysiac *argumenta*, it was mistakenly published under Dionysius Exiguus's name in both Wilhelm Jan, *Historia cycli dionysiani cum argumentis paschalibus et aliis eo spectantibus* (Wittenberg, 1718), 79-94 (repr. in *Patrologia Latina* 67, cols 497-508) and Krusch, 'Studien', 75-81.

[35] The Munich Computus transmits a dating clause for AD 689 based on the Victorian Easter table (cf. Mac Carthy, *Annals of Ulster* 4, lxx-i, Schwartz, 'Ostertafeln', 89-91). For this reason, it is clear that the Munich computist relied on an exemplar which favoured the Victorian reckoning, having AD 689 as *terminus post quem*. For more details on this text, see the forthcoming edition of the Munich Computus.

[36] Cf. Warntjes, 'Computus Einsidlensis', 63.

of the year leads then, quite naturally, into a thorough analysis of the Julian calendar. As far as the divisions of time are concerned, Isidore is in general the main source for their definitions, etymologies and explanations. Now, in the discussion of the definition, etymology and characteristics of a day (headed *De die* in *CE*), a day is divided into two intervals, namely day-time and night-time. In his *De natura rerum*, Isidore (*CE*'s source for this section) presented this division as follows:

> *Spatia diei duo sunt, interdianum et nocturnum; et est dies horarum XXIIII, spatium horarum XII.*
> 'Two are the intervals of a day, i.e. day-time and night-time; and a day consists of 24 hours, [each] interval [consists] of 12 hours.'[37] (*DNR* I.1)

An almost identical definition can be found in Isidore's *Etymologiae*:

> *Sunt autem diei spatia duo, interdianum atque nocturnum; et est dies quidem horarum viginti quattuor, spatium autem horarum duodecim.*[38]
> 'Moreover, a day has two intervals: the diurnal and the nocturnal. A day is twenty-four hours long, the interval twelve hours long.'

The passage of *CE* dealing with this division of a day into intervals (p. 90, ll. 1–5) is clearly based on Isidore's account, but also includes additional details and definitions (expansions are here indicated in Roman type; OIr words are in boldface):
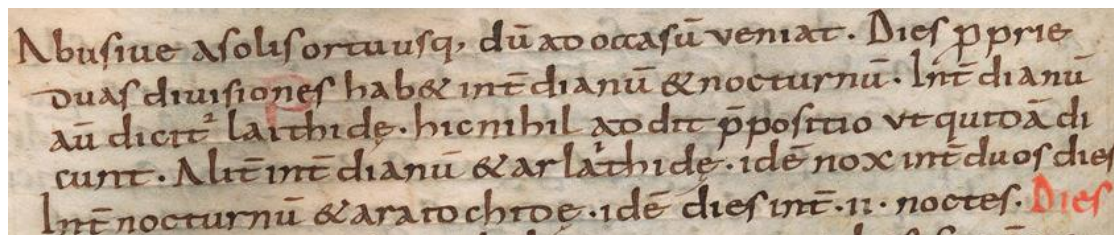
PL. I – *Computus Einsidlensis* (Einsiedeln, Stiftsbibliothek, 321 (647)), p. 90.

> *Dies proprie duas diuisiones habet: interdianum et nocturnum.*
> *Interdianum autem dicitur laithidę. Hic nihil addit praepositio, vt quidam dicunt. Aliter interdianum etarlaithidę. id est nox inter duos dies.*
> *Internocturnum etaraidchidę. id est dies inter .ii. noctes.*
> 'A day, strictly speaking, contains two divisions: *interdianum* and *nocturnum*. *Interdianum* means 'diurnal'. Here the preposition [i.e. *inter*] does not add anything, as some people say. Alternatively, *interdianum* [means] "between day-times", i.e. the night between two days, [and]

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[37] Isidore, *De natura rerum*, chap. 1, § 1 (edited and translated into French by Jacques Fontaine, *Isidore de Séville, Traité de la Nature* (Bordeaux 1980), 173); the translation is ours.

[38] Isidore, *Etymologiae* V, 30.2 (ed. Wallace M. Lindsay, *Etymologiarum siue Originum libri XX* (Oxford, 1911); transl. Stephen A. Barney, W. J. Lewis, J. A. Beach, Oliver Berghof, *The Etymologies of Isidore of Seville* (Cambridge, 2006)).

> *internocturnum* [means] "between night-times", i.e. the day between two nigths.'

Now, in Isidore's definitions the term *interdianum* means 'diurnal': *interdianum* is a substantivised adjective formed by adding an adjectival suffix to the adverb *interdiu* 'by day, in day-time', and it appears to be a learned coinage. As for *nocturnum*, this is a substantivised use of the adjective meaning 'nocturnal'.

In *CE*'s passage cited above, on the other hand, two different pairs of terms can be found. The first one closely follows Isidore, so that Lat. *interdianum* is simply translated into Irish as *laithide*, an adjective meaning 'daily, of the day'. This OIr adjective, formed by *laithe* 'day' + adjectival suffix *-de*, already appears in Ml. 133b15 (<*lathidi*>), where it translates Lat. *diurno*.

At this point, however, the Einsiedeln computist observes that 'the preposition does not add anything here, as some people say' (*hic nihil addit praepositio, ut quidam dicunt*); this can only mean that Isidore's term *interdianum* was by him wrongly analysed as *inter-dianum*, that is, presumably, a compound formed by the preposition *inter* plus a hypothetical adjective **dianus* directly formed from *dies*.

Having missed the actual derivation of *interdianum* from *interdiu*, and attributing to the element **-dianum* alone the sense 'daily' (> substantivised 'day-time'), the author was understandably puzzled by the presence of *inter*, which appeared to him not to add anything to the word's meaning. The result was a complete reversal of the Isidorian use of *interdianum* and *nocturnum*: the former term was interpreted as the space of time between two days (or rather intervals of day-time), i.e. night or night-time (*nox inter duos dies*), while a new term *internocturnum* was created in order to provide a corresponding technical term which could define the space of time between two nights, i.e. day or day-time (*dies inter duas noctes*).

The OIr terms *etarlaithide*[39] and *etaraidchide* (apparently *hapax legomena*) found in the second part of the passage are, then, straightforward calques on the Latin forms *interdianum* and *internocturnum*'.

It is noteworthy that no comparable interpretation of the terms *interdianum* and *(inter)nocturnum* can be found in any other computistical text. The Einsiedeln computist resorted to his native language here for the sake of conciseness: while in

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[39] Note that the spelling *etar-* (rather than *eter-*, from CC **inter*) suggests a pronunciation with schwa in the second syllable; cf. p. **[??]** below.

Latin he would have needed to describe at length his interpretation of these technical terms, in Irish one word for each term was enough.

Finally, this passage is also interesting in respect of the light it may shed on the ninth-century copyist's identity. Even though the script of the manuscript is clearly not of Insular type, we still cannot exclude *a priori* the possibility that the scribe was an Irishman writing on the continent and adopting a continental hand. An element which might in fact lend some support to this view is the very spelling of *etarlaithide*. This form appears in the manuscript with the first *i* written above line by the same hand.

PL. II – *Computus Einsidlensis* (Einsiedeln, Stiftsbibliothek, 321 (647)), p. 90.

It is tempting to assume that an Irish-speaking scribe would have spotted the omission of the *-i-* more easily than a continental copyist. Admittedly, however, this is not a very solid piece of evidence, and it may simply be a case of a particularly careful continental scribe, who was copying exactly what he had in front of him.[40]

Furthermore, the use of the *e caudata* at the end of the three OIr words in this passage is noteworthy, and might be a continental scribe's attempt to provide these words with some kind of Latinate appearance.

SECTION 2 (Einsiedeln, Stiftsbibliothek, 321 (647), p. 93, ll. 31-34)

The second instance of the use of Old Irish in *CE* occurs in the discussion of the Julian calendar month of February.

Augustine, and after him Isidore, derived the name of February from *februa*, i.e. the feast of purification celebrated in mid-February by the *Luperci*, the priests of the Roman god *Lupercus*. The relevant passage in Augustine's *Contra Faustum* (taken over almost verbatim by Isidore in his *De natura rerum*) reads:
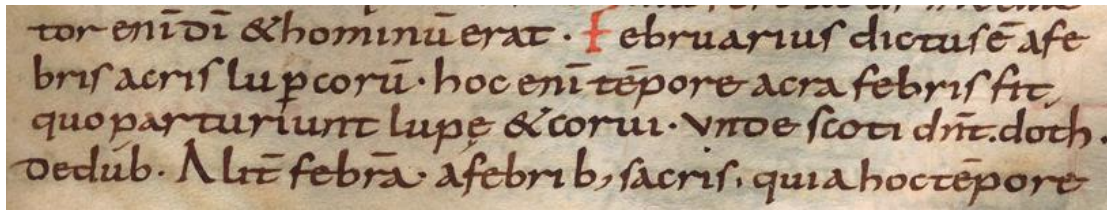
> *Februarius a Februis sacris Lupercorum.*

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[40] Interestingly enough, a similar correction seems to have been made by the not particularly careful continental copyist who transcribed the Cambrai Homily, viz. *a^irde* ('signs'), *Thes* 2, 244.29.

'February [is so called] from *februa*, the holy ceremonies of the *Luperci*.'[41]

Now, the first etymology for February given by the Einsiedeln computist is:

PL. III – *Computus Einsidlensis* (Einsiedeln, Stiftsbibliothek, 321 (647)), p. 93.

> *Februarius dictus e*st *a febris acris lup*ercoru*m. Hoc eni*m *te*m*pore acra febris*
> *fit quo parturiunt lup*ę *& corui. unde scoti d*icu*nt:* **dóth**. **dedúb**.
> 'February is so called from the heavy fevers of the *Luperci*. Indeed, heavy fever
> becomes manifest at this time, in which she-wolves and ravens give birth**;** for
> this reason the Irish say *doth de dub*.'

The *a Februis sacris* of the original etymology is misread as *a febris acris* 'from
the heavy fevers'.[42] This variation of the original etymology is not unique to *CE*. In
fact all principal Irish computistical texts of the late seventh and early eighth centuries
cite it (usually as *a febribus acris lupercorum*).[43] Furthermore, the new interpretation
made it necessary to explain the meaning of the term *Luperci*. Every Irish
computistical text treats this term differently; *CE*, for its part, seems to interpret it as a
compound of *lupae* and *corvi*, 'wolves and ravens', concluding that heavy fever
becomes manifest in February, the time in which wolves and ravens give birth.

The source for the peculiar information according to which wolves and ravens give
birth in February remains unknown to us, but, in any case, the association of these
two animals is not particularly striking in itself (wolves and ravens are often found
together in mythologies).[44]

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[41] Augustine, *Contra Faustum* 18.5 (ed. Joseph Zycha, *Sancti Aureli Augustini ... Contra Faustum,*
Corpus Scriptorum Ecclesiasticorum Latinorum 25 (Leipzig, 1891), 249-79: 494); Isidore, *De natura*
rerum, chap. 4, § 4 (Fontaine, *Traité de la Nature*, 189); the translation is ours.

[42] Classical Latin would of course have been *a febribus acribus*. See also the next note.

[43] Cf. Munich Computus, fol. 13r; *De divisionibus temporum*, c. 16 (*Patrologia Latina*, vol. 90, col.
660); *De ratione conputandi*, c. 29 (Walsh and Ó Cróinín, *Cummian's letter*, 140; see the variant
readings for this passage in the *apparatus criticus*). Note that this etymology contradicts Isidore,
Etymologiae V, 33.4 (ed. Lindsay, *Etymologiarum*; transl. Barney, *Etymologies*): *Ergo Februarius a*
Februo, id est Plutone, non a febre, id est aegritudine nominatus 'Therefore February was named from
Februus, that is Pluto, not from "fever", that is, sickness.'

[44] Cp. the Irish personal name *Conbrann < *kuno-branos* ('wolf-raven'), discussed by Art J. Hughes in

The meaning of *doth de dub* is not clear. As for the first term, in *DIL*, where not many examples of *doth* are listed, it is translated as 'bearing, bringing forth, hatching (of animals)'.

Doth is well attested in law texts, some of which can be dated to the OIr period. In a passage on livestock contained in the Old Irish Glossing of *Senchas Már* (*OGSM*),[45] we can read *rē duith* 'the time of farrowing' (*CIH* 897.26).[46] Here *duith* points to *doth* being an *o*-stem. This is confirmed by a further OIr attestation of the gen. sg. of *doth* in a fragment of *Cáin Fuithirbe*, where we find *dibh duith* (*CIH* 776.31).[47]

The first instance reported in *DIL* (*cech suth soinmech, cach doth toirthech* 'every prosperous offspring, every fruitful bearing')[48] derives from the version of *Audacht Morainn* contained in the Book of Leinster, but this attestation is inconclusive as to the inflectional class of *doth*. Among the other examples cited in *DIL*, we may mention the sentence *téit in banchorr isin fairrgi síar do duth* ('the she-heron goes on the ocean westwards to hatch'),[49] which contains the dat. sg. of *doth*, i.e. *duth*. This

'Old Welsh *Cunbran/Conbran* < **kunobranos* 'wolf-raven', in the light of Old Irish *Conbran*(*n*)', *Ériu* 44 (1993), 95-98. Outside Celtic, a good example from the Germanic world is provided by *Beowulf* XLI, 3024–3027: *ac se wonna hrefn / fūs ofer fǣgum fela reordian, / earne secgan hū him æt æte spēow, / þenden hē wið wulf wæl rēafode* ('and yet the black raven, / quick on the marked men, shall have much to speak of / when he tells the eagle of his takings at the feast / where he and the wolf bared the bodies of the slain'. Text from Bruce Mitchell and Fred C. Robinson (eds), *Beowulf: an Edition* (Oxford, 1998), 155; translation from Michael Alexander, *Beowulf: a Verse Translation* (London, 2003 [1st reprint of the 2nd ed.]), 107). For more examples of passages and stories associating wolves with ravens, see Karen Elizabeth Bukowick, *Truth and Symbolism: Mythological Perspectives of the Wolf and Crow*, B.A. dissertation, Boston College, 2004 (available at the website <http://dissertations.bc.edu/ashonors/200444/>).

[45] For more details on *OGSM* cf. Liam Breatnach, *A Companion to the Corpus Iuris Hibernici* (Dublin 2005, 40–1, 338–46).

[46] Ed. and transl. in Fergus Kelly, *Early Irish farming* (Dublin 1997), p. 522 §3. A further example (provided by Prof. Liam Breatnach) from *OGSM* is *cerc in sō mos-gaib doth* 'this is a hen which hatches soon' (*CIH* 920.38; our translation).

[47] Since *dibh duith* is glossed *toglūasacht* 'aborting', Prof. Liam Breatnach suggests that *dibh* is probably an error (through omission of a suspension-stroke) for *díbad* 'extinction'.

[48] Cf. Fergus Kelly (ed.), *Audacht Morainn* (Dublin, 1976), p. 63 §29. The translation is ours.

[49] Ed. and transl. in Kuno Meyer, *The Triads of Ireland* (Dublin, 1906), no. 237. Note that in the same passage the form *doithi* appears, in the sentence *nocon fagbat curaig eolus cia airm in doithi*. Meyer seems to have understood this term as a noun (he translated 'coracles have not discovered the place of hatching'), and indeed this passage is cited in *DIL* s.v. *doth*. However, *doithi* is the pres. indic. 3rd sg.

form could indifferently belong to an *o*- or to an *u*-stem, just as gen. pl. *doth*, to be found O'Davoren's Glossary.[50] The only form which points to *doth* being a *u*-stem is gen. sg. *dotha*, to be found at *CIH* 1610.7 (*aimser dotha* 'time of hatching') and *CIH* 2274.30 (*cen ro-aine ndotha*).[51] These attestations, however, are much later than the above-mentioned one from *OGSM*, so that *doth* is most likely to have been an OIr *o*-stem which later switched to *u*-stem.[52]

The third word in this passage is *dub* 'dark, black', which I take to be a neuter substantivised adjective: the 'dark thing' mentioned here could refer elliptically to the colour of wolves and ravens, animals which were likely to evoke the obscurity of the night, the darkness of death. At this point, the whole phrase can be tentatively explained as follows:

> *doth*   *de*   *dub*
> brood-NOM.sg.   'from'   'dark thing'-DAT.sg.n.
>   'brood of a dark thing'

Finally, we may note that two apices are written above *doth* and *dedub*. This is a quite commonly used means for distinguishing vernacular passages from a surrounding Latin context.[53]

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conjunct of *doithid* 'brings forth, hatches' (cf. *DIL* s.v. *dothaid*). Consequently, we should read *cia airm i ndoithi* 'where it hatches'.

[50] Cf. Whitley Stokes, 'O'Davoren's Glossary', *Archiv für celtische Lexikographie* 2 (1904), §1375.

[51] Both examples (the second of which has been kindly pointed out to us by Prof. Liam Breatnach) are found in commentaries on *Uraicecht Becc* (cf. Breatnach, *Companion*, 315).

[52] *Pace LEIA* D-186, where it is suggested that *doth* should be taken as an 'ancien th[ème] en -*u*- (**dotu*-)'. The case of *rath* 'grace', with OIr gen. sg. *raith* but later gen. sg. *ratha*, is comparable (cf. *DIL*, R col. 15.4).

[53] In the *prima manus* of Wb., the copyist 'sometimes supplied slanted (acute) strokes above an Old-Irish word to identify it as vernacular […]. But in doing so he took care to locate the strokes above consonants, as if aware that placing them above vowels might cause them to be confused with acute accents. This hypothesis, if correct, would imply that he was aware of the function of accent marks, but perhaps did not wish to use them because they were not present in his exemplar' (Ó Néill, 'The *Prima Manus* in Würzburg', 231). On this topic, see also Dáibhí Ó Cróinín, 'The Earliest Old Irish Glosses', in Rolf Bergmann, Elvira Glaser and Claudine Moulin-Fankhänel (eds), *Mittelalterliche volkssprachige Glossen* (Heidelberg, 2001), 7–31: 12.

SECTION 3 (Einsiedeln, Stiftsbibliothek, 321 (647), p. 97a, ll. 11–29)

The most extensive passage in Old Irish in *CE* is a list containing the first thirteen Old Irish numerals (all ordinals, except for '1' and '11').[54] When explaining the functioning of the Julian calendar, the Einsiedeln computist sets the Julian calendar notation for the days of January (i.e. calends, fourth nones, third nones, etc.) against a simple consecutive count of days in Old Irish.

PL. IV – *Computus Einsidlensis* (Einsiedeln, Stiftsbibliothek, 321 (647)), p. 97.

*De dieb*us *mense*[i]s *con*putandis.	
oin	*Kal*endae
ailiu	*iiii N*onas
tres	*iii N*onas
cethirmat	*ii N*onas
coicet	*Non*ae

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[54] This list of numerals is, to our knowledge, mentioned only once in print, in Morel's 1843 list of Einsiedeln manuscripts, where it is referred to as 'Deutsche Zahlnahmen'. Gallus Morel, 'Handschriften der Klosterbibliothek zu Einsiedeln', *Archiv der Gesellschaft für ältere deutsche Geschichtskunde* 8 (1843) 736-49: 743 (note that Morel's brief description of this manuscript is faulty in more than just this one instance).

sesset	*viii Id*us
sechtmet	*vii Id*us
*oct*met	*vi Id*us
nomet	*v Id*us
decmed ·	*iiii Id*us
oindeac	*iii Id*us
ailiu deac	*ii Id*us
tres deac	*Id*us
*& rel*iqua .	

*Sic taliter enumeres omniu*m *mensium dies.*

With this correlation, the computist obviously wanted to illustrate that the first day of January is called calends, the second fourth nones, etc. On the other hand, it appears that the Irish, like most (and not only Celtic) people, counted the days of a month consecutively. Furthermore, the use of Old Irish makes the distinction between the two columns even clearer. If the computist had used Latin in the left column instead of Old Irish, this could have led to confusion already in the first entry: *primus Kalendae* might have been understood not as 'the first day [is called] calends'**,** but rather as 'the first calends'; the linguistic switch prevented the possibility of such a misunderstanding on the part of the reader.

We can now proceed to an examination of the individual forms.

(1) *oin* 'one': the first numeral, which appears in its usual OIr form, is cardinal and not ordinal, and the same applies to the eleventh numeral of the list (*oindeac*, 'eleven' and not 'eleventh'). The reason for this appears to be the use of the cardinal numeral for the first day of the Hebrew week (*una sabbati* instead of *prima sabbati*) by some Evangelists, as Augustine explains:

> *una enim sabbati tunc appellabatur dies, qui nunc dominicus appellatur, quod in euangeliis apertius inuenitur. nam dies resurrectionis domini, prima sabbati a matthaeo, a caeteris autem tribus una sabbati dicitur.*
>
> 'Indeed, the day which nowadays is called Sunday, was then called *una sabbati*, which is quite clearly learnt from the Gospels. For the day of the resurrection of the Lord is called *prima sabbati* by Matthew, but *una sabbati* by the other three.'[55]

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[55] Augustine, *Epistola XXXVI* (ed. Alois Goldbacher, *Sancti Aureli Augustini Hipponiensis episcopi Epistulae II, Corpus Scriptorum Ecclesiasticorum Latinorum* 34.2 (Leipzig, 1898), 31-62: 57); the translation is ours.

Note that in *CE*'s list of numerals, *oin* and *oindeac* are not accompanied by the particle *a*, which generally occurs 'when these forms are not preceded by the article or by another numeral, or otherwise defined'.[56] The particle might have been omitted here because the entire list was actually perceived as a count of days ('[day] one', 'second [day]', 'third [day]' etc.) rather than absolute count ('one', 'second', 'third' etc.).

(2) *ailiu*: the ordinal numeral *aile* 'second' (lit. 'other') is here given in the dative case. The reason for this is not entirely clear. *Ailiu* may be a temporal dative, so that this form could be translated as 'on the second [day]'; the same applies to (12) *ailiu deac* ('on the twelfth [day]').

As for the use of the dative in (2) and (12) we may note that *DIL* records s.v. *aile* several occurrences of this numeral (all taken from legal texts) with the specific meaning of 'period of two days' (cf. *DIL*, A col. 117.35–43),[57] as well as its use in fractions (cf. e.g. *Thes* II, 13.29 *aili deac brotto* 'of the twelfth part of a moment', from the glosses in the Carlsruhe Beda). It seems therefore reasonable to suppose that the dative had here a disambiguating function, that is, to signify only one individual day, the second day of the month (or the twelfth, in the case of *ailiu deac*), as opposed to a temporal duration of two (or twelve) days (or even to the fraction 'one twelfth [of a day]', as far as *ailiu deac* is concerned).

(3) *tres*: 'third'. This orthography agrees with Sg. 104b1 *tres*.[58]

(4) *cethirmat*: 'fourth'. This is the most problematic form in the list. Firstly, there is the question of orthography. Internal *-th-* in *cethirmat*, as well as in *laithide* and *doth* (see passages 1 and 2 above), shows that the use of digraphs with *h* to mark lenition was well established by the time of composition of *CE*. On the other hand, final *-t* for /θ/ in numerals 4, 5, 6, 7 and 9, and in the form *leut* found in passage 4 (cf.

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[56] Cf. *GOI* § 386.

[57] As pointed out by David Greene, 'in legal texts, periods of time are indicated by the feminine form of the cardinal *oen* and of the ordinals of other numerals' (David Greene, 'Celtic', in Jadranka Gvozdanović (ed.), *Indo-European Numerals* (Berlin, 1992), 497–554: 520); see also David Greene, 'Periods of Time', *Ériu* 22 (1971), 176-8.

[58] The vocalism of the more common form *tris(s)* is probably taken from the cardinal numeral *trí*; the regular development is **tri-stos* ('that stands in third position') > **trissos* > **trissah* > **tressa* > OIr *tres(s)* (cf. Kim McCone, 'An tSean-Ghaeilge', 209, § 35.9). David Greene, on the other hand, suggested that *tres(s)* derives from **tristos* and *tris(s)* from **tristis* (Greene, 'Celtic', 515).

p. **[??]** below) attests to an older orthographical system, known from other EOIr sources. The absence of orthographical devices marking the lenition of voiceless plosives is well attested, for instance, in the *prima manus* of the Würzburg glosses (e.g. Wb. 7a7 *comtinol* instead of *comthinól*; Wb. 12c18 *forcanit* instead of *forcanith* etc.). This system may have had its origins in the writing conventions of the Ogamic inscriptions (but note that it was common in the orthographical system of Old Welsh as well).[59] The presence of a traditional and an innovative spelling method within the same word (*cethirmat*) is paralleled in the *prima manus* of Wb., where both *-t-* and *-th-* were used to represent /θ/ (cf. e.g. Wb. 6c2 *diltuth*; Wb. 13d24 *roslogeth* etc.). Alternatively, for the possibility that *-t* represents [ð] rather than [θ], see (10) below.

Secondly, there is the problem of morphology of *cethirmat*. This form differs substantially from the usual OIr ordinal 'fourth', *cethramad*. The spelling *cethirmat* is ambiguous as to the quality of the *-th-* and *-rm-*, as well as to the quality of the vowel of the second syllable. Furthermore, the presence of *a* in the final syllable is in sharp contrast with the EOIr <*-met* / *-med*> in the numerals 7, 9 and 10 (*sechtmet*, *nomet*, *decmed* for Classical OIr *sechtmad*, *nómad*, *dechmad*). If *a* is not a scribal mistake for *e* (and we certainly do not have any good reason to think that it is), then it appears to represent the evolution to schwa of the unstressed internal *e* of the suffix *-metos* (cp. Gaulish *sextametos*, *oxtumetos* etc.); compare *etar* rather than *eter* in the forms *etarlaithide* and *etaraidchide* discussed above. In any case, the presence of a schwa in the last syllable of *cethirmat* is not particularly troubling: the evidence of innovative forms in the Cambrai Homiliy such as *fristossa*m (*Thes* II, 245.9) and *adrimther* (*Thes* II, 246.26), next to conservative *fedot* (*Thes* II, 244.32) and *apstol* (*Thes* II, 246.15), leads us to confirm McCone's statement (*Relative chronology*, 136) that 'this crucial development had not taken place long before the composition of the homily', a text

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[59] For more details on this archaic orthographical system, see Damian McManus, 'Ogam: archaizing, orthography and the authenticity of the manuscript key to the alphabet', *Ériu* 37 (1986), 1–31: 11; Anthony Harvey, 'Some significant points of Early Insular Celtic orthography', in Donnchadh Ó Corráin, Liam Breatnach, Kim McCone (eds), *Sages, Saints and Storytellers – Celtic Studies in Honour of Professor James Carney* (Maynooth, 1989), 56–66: 59; Damian McManus, *A guide to Ogam* (Maynooth, 1991), 124 (§ 6.30b); Anders Ahlqvist, 'Litriú na Gaeilge', in *SnaG*, 23–59: 31, § 3.17. Interestingly enough, there is no trace of this older system in the Cambrai Homily.

certainly earlier than *CE*. For this reason, the spelling of numerals (7), (8) and (9) may in fact reflect nothing but the retention of an archaic orthographical convention.[60]

The other (and better attested) OIr form for the ordinal for 'fourth', *cethramad*, is already attested in one of the Biblical glosses in the Book of Armagh (*Thes* I, 497.13 *iár cethramad laithiu* 'after the fourth day'). In view of Gaulish *petuar[ ]*[61] (from La Graufesenque) and MW *petwerydd*, there can be little doubt that the form which should be reconstructed for CC is *k^wetwaryos*,[62] *cethramad* being therefore an Irish innovation. Kim McCone suggested an analogical derivation of *cethramad* from AIr *$k^{w'}e\theta ur$-a$\tilde{v}e\theta$*, on the basis of the proportion *$d'e\chi'$: $d'e\chi$-a$\tilde{v}e\theta$* ('ten : tenth') = *$k^{w'}e\theta ur'$* ('four') : X.[63] This reconstruction is of course based on McCone's own derivation of (E)OIr *cethuir* (= /k´eθur´/) 'four' from PIr *k^wetur-eh*, showing the generalisation of the weak stem *k^wetur-* in the whole paradigm, at the expense of the strong stem *k^wetwor-*. The ordinal *cethramad*, however, could just as well be the outcome of AIr *$k^{w'}e\theta wor$-a$\tilde{v}e\theta$* (through EOIr *$k'e\theta w^\dagger ra\tilde{v}e\theta$ > $k'e\theta ra\tilde{v}e\theta$*).[64]

There are at least two ways to approach *cethirmat*. We may try to explain it either as an early by-form of *cethramad* which survived side by side with it until its ultimate disappearance (for which AD 719 would be the *terminus post quem*), or else as a very recent (probably post-syncope) and ephemeral by-form.

Taking the first approach, a form close to *cethirmat* could be obtained, for instance, by positing a PIr or AIr formation based on the CC composition form of 'four' *k^wetru-*, attested in Gaul. *Petru-corii*, *petru-decameto* ('fourteenth') etc.,[65] and continued in MW *pedry-*,[66] that is PIr / AIr *$k^{w'}e\theta ru$-$\tilde{v}e\theta(ah)$*. Such a form would regularly develop as follows: *$k^{w'}e\theta ru\tilde{v}e\theta(ah)$ > $k'e\theta r^\dagger\tilde{v}e\theta$* > EOIr *$k'e\theta\partial r\tilde{v}e\theta$* > OIr *$k'e\theta\partial r\tilde{v}\partial\delta$*. The written realisation of the last two stages would of course have been

[60] Accordingly, *<sechtmet>*, *<nomet>* and *<decmed>* were probably already pronounced as in Classical OIr, i.e. /s´eχt$\tilde{v}$$\partial\delta$/, /n$\bar{o}\tilde{v}\partial\delta$/ and /d´e$\chi\tilde{v}\partial\delta$ /. In the case of *coicet* and *sesset*, the spelling of the unstressed vowel is the same as in Classical OIr (*cóiced*, *se(i)ssed*).

[61] The full form should probably be restored as *petuar[ios]*, cf. Xavier Delamarre, *Dictionnaire de la Langue Gauloise* (Paris, 2003 [2nd ed., revised and augmented]), 251 (s.v. *petuarios*).

[62] Probably realised as *[kʷetwariyos], with a non-phonemic glide before -*y*-.

[63] Cf. McCone, 'An tSean-Ghaeilge', 209, § 35.9.

[64] Kim McCone, 'Old Irish "three" and "four": a question of gender', *Ériu* 44 (1993) 53-73: 56, and id., 'An tSean-Ghaeilge', 203-4, §35.4.

[65] For further Gaulish attestations and bibliographical references, see Delamarre, *Dictionnaire*, 250-1.

[66] Cf. *LEIA* C-87; Greene, 'Celtic', 539.

respectively *<cet(h)armet(h)> and *<cetharmad>, but we can suppose that the orthography of the cardinal form, *ceth(u)ir[67] or ceth(a)ir might have led the scribe to represent the schwa in the second syllable as -i-, especially since around AD 700 the relatively rigid OIr conventions for representing a schwa in an unstressed closed syllable (for which cf. *GOI* § 102) may not yet have been so well established. If this was the case, then *CE cethirmat* would represent a combination of orthographical eccentricity (-i-), conservativeness (-t) and innovation (-th-, -a-).

This explanation, however, appears to be both uneconomical and *ad hoc*. In order to maintain a reconstruction such as *$k^{w'}e\theta ru$-ṽeθ(ah)*, not only do we need to posit the survival of the composition form *$k^w etru$-, otherwise unattested in Goidelic, until Primitive or even Archaic Irish, but we must also conjecture, firstly that a productive ordinal suffix *-ṽeθ(ah)* was created, supposedly by segmentation of PIr / AIr *oχtu-ṽeθ(ah)* (< CC *oχtūmetos*), co-existing then with the much more obvious *-aṽeθ(ah)*, secondly that two morphologically different but semantically identical forms of the numeral 'fourth' existed side by side for a period of at least 150/200 years (between syncope and *ca.* AD 700), and thirdly that the author of *CE* used an unparalleled (to our knowledge) way of representing as *i* the sound schwa in an unstressed syllable between non-palatal consonants.

A more straightforward explanation is to take *cethirmat* as a post-syncope formation, in which an ordinal suffix *-ṽəð* (easily obtainable by natural re-segmentation of *sechtmad*, *ochtmad* etc. as *secht-mad*, *ocht-mad* etc.) was simply added to the basic cardinal numeral *ceth(u)ir* or *ceth(a)ir*. It is reasonable to suppose that in that case a palatal cluster [-r´ṽ´-] would have resulted from progressive assimilation, and this may lead us to expect *<cethirmet>. Yet, this is hardly significant, considering certain forms in the Cambrai Homily such as *coicsath* (*Thes* II, 245.13; OIr *coicsed*), which can quite confidently be interpreted as /kog´s´əθ/ by comparison with *adrimther* (*Thes* II, 246.26) = /að·rīṽ´θər/ (< *·rīṽ´θar).[68]

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[67] For the orthographical fluctuation -C*ui*C´(-) / -C*i*C´(-) in an unstressed syllable, cp. Wb. 12d1 *cosmuil* vs Wb. 2a11 *cosmil*; cf. also *GOI* § 102.6; Ahlqvist, 'Litriú', 28, § 3.8.

[68] Following McCone, *Relative chronology*, 129.

In conclusion, the spelling *cethirmat* is likely to represent */kˊeθərˊṽˊəð/ (or, if we start from **ceth(u)ir*, */kˊeθurˊṽˊəð/), a more or less ephemeral by-form of *cethramad*.[69]

 (5) *cōicet*: 'fifth'; (6) *sesset*: 'sixth'. Apart from the EOIr final consonant *-t* (for /θ/, or more probably for /ð/; see (4) and (10)), these forms correspond to Classical OIr *cóiced*, *se(i)ssed*.[70]

(7) *sechtmet*: 'seventh'. In addition to the final consonant *-t*, this form shows the EOIr unstressed vowel, a feature also seen in (9) *nomet* and (10) *decmed*. For the possibility, however, that this is no more than an orthographical archaism, see (10) below.

(8) *oct*met: 'eighth'. The abbreviated MS form <*oct-*> has been here expanded on the basis of the other numerals. The omission of the lenition marker on the *c* in the consonantal cluster *-ct-* is of course very common throughout OIr (cf. *GOI* § 28), *h* being redundant in this phonetic environment (since *kt is always [χt] in Celtic).

(9) *nōmet*: 'ninth'. This form corresponds to Classical OIr *nómad*.

(10) *decmed*: 'tenth'. For the omission of the lenition marker on the *c*, cf. (4) above); examples of *c* for /χ/ can also be found in the *prima manus* of Wb. (e.g. Wb. 17d1 *cetarcoti*, probably for *cetharchoti*). The final *-d*, on the other hand, is striking. Notwithstanding the consistent use of *-t* for /θ/ in the other numerals, the *-d* here can only mean that the sound change /θ/ > /ð/ at the end of a word-final unstressed syllable had already happened by the time of composition of *CE*. Accordingly, not only was MS *decmed* almost certainly realised as /dˊeχṽeð/ or even /dˊeχṽəð/, but also the same must apply to the other forms in *-et* (MS *coicet* representing /kōgˊeð/ or /kōgˊəð/ and so on). The evidence of our text accords with McCone's statement that 'a late seventh-century date for this voicing is indicated by the fact that the Cambrai Homily consistently ignores it and the Würzburg *prima manus* of about 700 A.D. has only one clear instance of *-d* in pl. *dilgid* 'forgive!' as opposed to several of *-th* or proclitic *tu-*/*to-* (OIr. *du-*/*do-*)'.[71] Additionally, the presence of the same fluctuation

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[69] I wish to thank Dr Graham Isaac, who discussed this form with me, and provided useful suggestions. I alone, however, am responsible for the views here expressed [JB].

[70] As for *sesset*, the omission of the palatal glide 'where a stressed syllable ends in a vowel and the next begins with a palatal consonant' (*GOI* § 86b) is frequent throughout the OIr period.

[71] McCone, *Relative chronology*, 133. See also idem, 'Final /t/ to /d/ after unstressed vowels and an Old Irish sound law', *Ériu* 32 (1981), 29-44: 44, n. 48: 'The Wb. "prima manus" has one certain

between archaic *-t(h)* and innovatory *-d* (for [ð]) in *CE* and the *prima manus* of Wb. confirms the absolute dating of the latter source to *ca.* AD 700.

(11) *oīn deac*: 'eleven'. See under (1) above.

(12) *ailiu deac*: 'twelfth'. See under (2) above.

(13) *tres deac*: 'thirteenth'. See under (3) above.

SECTION 4 (Einsiedeln, Stiftsbibliothek, 321 (647), p. 123, ll. 23-24)

The final passage of Old Irish in *CE* also concerns numerals, this time fractions. One of the particularly Irish features of early medieval computistics was the division of the 24 hours of a *saltus lunae* by the 235 lunations of a 19-year lunisolar cycle. At a certain stage in this mathematical operation the fraction 5/12 occurs.[72] In medieval mathematics, fractions of this size were fairly uncommon; usually, no fractions other than ½, 1/3, ¼ and multiples thereof were used. Accordingly, the Einsiedeln computist appears to have felt the need to explain the fraction 5/12 further. The Old Irish phrase used to define this fraction is *maá triun laigu leut*, 'greater than one third, smaller than one half' [cf. Pl. V].
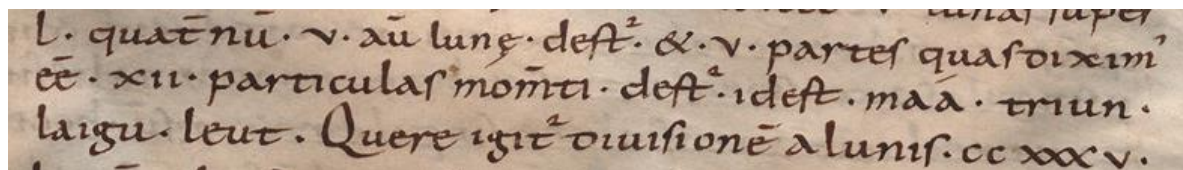
PL. V – *Computus Einsidlensis* (Einsiedeln, Stiftsbibliothek, 321 (647)), p. 123.

It will be noted that this is a very precise definition, since 1/3 = 4/12 and ½ = 6/12, 5/12 being right in the middle between these two fractions.[73]

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example of *-d* for *-th* in *dilgid* (18a11), which may well imply that *-th* there in such cases is merely a conservative spelling which lags behind actual pronunciation. If so, the sound change itself may be rather earlier, but hardly prior to the Cambrai Homily'.

[72] The calculation up to this point is as follows: one hour has forty moments; accordingly, 24 hours have 960 moments. These 960 moments, divided by 235 lunations, result in four moments per lunation and a remainder of 20 moments. Each of these 20 moments is divided into 12 parts, resulting in a total of 20 x 12 = 240 twelfths of a moment. This total of 240 divided by 235, then, leads to one twelfth of a moment per lunation and a remainder of five twelfths of a moment, i.e. the fraction in question here.

[73] A similar expression can be found in a Middle Irish metrical tract; in a section concerning several metres derived from the *rannaigecht mór*, we find the following phrase: *Ni as fuillíu bic inda coiced inso 7 ni roich cethramad* ('This is something which is slightly greater than a fifth and it does not extend to a quarter'; metre: $2^1 2^1 2^1 2^1$), *MV* III §75. We owe this reference to Dr Roisin McLaughlin.

As for the OIr forms appearing in this definition, all of them are well known from other sources, but their orthography presents several points of interest.

The first form, *maá* 'greater, more', is the comparative of *már* 'great'. The simultaneous presence of vowel doubling and *apex* to mark vocalic length could represent a compromise between the old and the new way of indicating a long vowel (cp. e.g. Wb. 4a11 *báas* 'death', Wb. 3d21 *baás* 'id.', Wb. 7a7 *gabáal* 'taking', Wb. Wb. 19b20 *máam* 'yoke', Wb. 12d28 *máar* 'great'; an orthography almost identical to our form in *CE* can be found at Wb. 12a23 *máa*),[74] so that <*maá*> would simply represent /mā/. However, in the light of the great analogical interplay which seems to have operated between the various degrees of comparison of *már* (cf. *GOI* §375), we cannot exclude the possibility that <*maá*> was actually realised as [maä].[75]

The second form, *triun*, is unproblematic: it is the expected dat. sg. of the neuter *o*-stem noun *triän* 'one third' (later *trían*).

The third form, *laigu* 'smaller, less' (comparative of *becc* 'small'), is slightly more problematic. The heretofore attested spellings in OIr are *laugu* (= /lawγu/, e.g. Wb. 6b12), *lugu* (= /luγu/, e.g. Wb. 16c26) or *laigiu* (= /laγ´u/, e.g. Ml. 17c7; cf. *GOI* § 373). It is unlikely that the form in *CE* is a spelling variant of the last of these, since the palatalised -*g*- is almost certainly secondary, and analogical to the superlative *laigem* (= /laγ´əṽ/, in turn the result of an analogical development from an earlier **laγaṽ*).[76] It is also unlikely that it is a mistake for *laugu*,[77] in the light of orthographical fluctuations such as *taulach / telach / tailach* ('hill') or *aulad / ilad / elad / ailad* ('grave'; cf. *GOI* § 80c), *laigu* is much more likely to represent an early instance of the phonetic instability of the diphthong *aw* in word-initial and word-internal position;[78] indeed, another example of the same phenomenon can be found in

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[74] Cf. McCone, *Relative chronology*, 28: 'Gemination would seem to have been the first device employed in order to distinguish a long from a short vowel. Thus the seventh-century Cambrai Homily mostly leaves vowel length unmarked but sometimes indicates it by doubling'. Cf. also *GOI* § 27.

[75] I intend to deal with the various forms of the comparative and superlative of *már* in a separate article [JB].

[76] For more details on the etymology of the OIr comparative and superlative of *becc*, see McCone, 'An tSean-Ghaeilge', 125, § 20.3.

[77] In *laugu* the diphthong /aw/ derives of course from Primitive Irish *u*-infection of stressed *a* (cf. Greene, 'Diphthongs', 28-9; McCone, *Relative chronology*, 111): IC **lagūs* > PIr. **laγūh* > AIr **lawγū* > OIr *laugu*.

[78] Cf. Greene, 'Diphthongs', 41-2.

the *prima manus* of Würzburg, where we read *rulaimur* (Wb. 17c21; 'I dare'), to be compared with Wb. (main hand) 17a8 *rolaumur* and Ml. 21b5 *rolomur* (cf. *GOI* § 80b).

The last form, *leut*, is the dat. sg. of *leth* 'one half' (neuter *o*-stem). The final consonant -*t* stands of course for /θ/, and represents another instance of the early orthographical convention already discussed for the numerals *cethirmat*, *coicet* etc. The word being in the dative case, the *u*-colouring of the stressed *e* is also unproblematic.

4. CONCLUSION

The newly discovered *Computus Einsidlensis* is an important witness to Irish monastic learning in the period around 700 AD, a time in which not only computistical, but also grammatical and exegetical studies flourished in the *regiones Scottorum* to an exceptional degree. Through comparison with the Munich Computus, a text precisely datable to AD 719, it has been established that *CE* preceded that text. Furthermore, the mention of a certain Theodore suggests that *CE* was compiled after the establishment of the Canterbury school under Theodore of Tharsus. The computistical milieu in which *CE* was written points to a date posterior to AD 689 for its composition, so that AD 689 – 719 can safely be considered as the period in which *CE* was compiled.

The importance of *CE* for the study of Old Irish is manifold. First of all, the close dating of this text to the period AD 689 to 719 allows us to draw several conclusions concerning the linguistic phase normally identified as the moment of transition from Early to Classical Old Irish. In particular, we may note that:

(1) the close similarity between the orthographical system used by the author of *CE* and that of the Wb. *prima manus*, both of which may be termed 'transitional' due to their mixture of conservative and innovative features, strongly supports the traditional dating of the latter source to *ca.* AD 700;

(2) the simultaneous presence of forms spelt with -*t* (for /θ/; e.g. *cethirmat*, *coicet* etc.) and with -*d* (for /ð/; *decmed*), confirms that the change /-θ/ > /-ð/ after an unstressed vowel had already taken place by *ca.* AD 700 and should probably be ascribed to the late seventh century;

(3) the presence of -*a*- in *etar*- and in the ordinal numeral *cethirmat* indicates that unstressed vowels (apart from *u*) in closed syllables had already merged into schwa

by the time *CE* was composed. Indeed, analogous evidence from the Cambrai Homily had already led some scholars to the conclusion that this change took place considerably earlier than AD 700, although orthographical conventions could impede its being reflected in spelling.

In addition, *CE* preserves some otherwise unattested OIr forms:

(1) the compounds *etarlaithide* and *etaraidchide* represent calques on Lat. *interdianum* and *internocturnum*, which in their turn represent Irish coinages ultimately based on a re-elaboration of Isidore's terminology for 'day-time' and 'night-time';

(2) the ordinal numeral *cethirmat* ('fourth'), which differs from the usual form *cethramad* known from other OIr sources, is likely to represent an ephemeral post-syncope formation directly based on the cardinal numeral **cethuir* or *cethair*.

Finally, most of these passages, especially the one defining the fraction 5/12 as *maá triun laigu leut* 'greater than a third, smaller than a half'), confirm our views[79] on the consistent use of Old Irish by early medieval Irish monastic scholars for didactic purposes: whenever ambiguity could arise from the use of Latin, the switch to Irish (the vernacular of both the author and his audience) allowed for a higher degree of clarity and precision, with the aim of achieving a thorough understanding of the subject on the part of the student. Computistics (and it must be presumed also grammar and exegesis) were taught bilingually in the classroom: this fact is reflected in the earliest Irish textbook on the reckoning of time, the *Computus Einsidlensis*.

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[79] Cf. Bisagni and Warntjes, 'Latin and Old Irish'.