

MO-SINNU MOCCU MIN
AND THE COMPUTUS OF BANGOR

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Despite the abundant literature on the subject of the Paschal controversies in the early Irish churches, we are in some respects still as far as ever from a reconciliation of the conflicting evidence. The long story of the 84-year cycle and its use in Ireland has been brilliantly expounded by Krusch¹ and Mac Carthy,² even if we still do not know for certain when or whence that cycle was first introduced, and even though we are still without any solid evidence for the historical Easters celebrated in Ireland.³

The story of the controversies begins with St Columbanus, who, about the year AD 590, left his monastery at Bangor (Co Down) with twelve companions and travelled to Burgundy to found there the three monasteries of Anagray, Luxeuil, and Fontaines which were to become the hub of Irish monastic influence in Europe in the succeeding centuries. Columbanus, however, found in Burgundy a number of Gallican rites which differed from his own and the next few years comprise a well-known catalogue of contentions between the Irish and the Merovingians, for which a group of five letters written by Columbanus himself⁴ are our main evidence.

¹ Bruno Krusch, *Studien zur christlich-mittelalterlichen Chronologie. Der 84-jährige Ostercyclus und seine Quellen* (Leipzig 1880).

² Bartholomew Mac Carthy (ed), *Annála Uladh. Annals of Ulster, otherwise, Annála Senait, Annals of Senat IV* (Dublin 1901) xiv-clx.

³ 'Thatsächlich ist kein einziger Ostersonntag der irischen Observanz bekannt', the verdict of Eduard Schwarz 'Christliche und jüdische Osterafeln' *Abh Kgl Gessell Wiss Göttingen*, phil-hist K1, N. F. 8, No 6 (Berlin 1905) 1-196; at p 102.

⁴ Wilhelm Gundlach (ed), *Columbae sive Columbani abbatis Luxoviensis et Bobbiensis epistolae* MGH Epist Merov Karol aevi I (Berlin 1892) 154-90; G. S. M. Walker (ed), *Sancti Columbani opera. Scriptores Latini Hiberniae 2* (Dublin 1957; repr. 1970) 2-59. There is no need here to discuss the canon of Columbanus's writings; the epistles cited below are universally accepted as genuine. My citations are from Walker's edition.

Chief among these differences, it appears, was the question of the Paschal cycle. In the first of his letters,¹ directed to Pope St Gregory the Great around the year AD 600, Columbanus protested against the Paschal observance which he found in Gaul, based on the Easter cycle of Victorius of Aquitaine. He told the Pope that the Victorian table had been studied by the foremost Irish scholars and computists and had been not only rejected but considered more worthy of ridicule than of authority.² In his second letter,³ addressed to the Gallican bishops gathered in synod at Chalon-sur-Saône in AD 603, Columbanus returned to the fray and cited as his authority in this question 'the traditions of my fatherland according to the calculus of 84 years' and the work which modern computists know as the Pseudo-Anatolian Canon Paschalis.⁴

Our concern is not with Columbanus nor with the Irish foundations in Europe, but with the computus at Bangor. Yet the two are obviously inseparable, for Columbanus was driven from Burgundy and his followers who remained at Luxeuil almost immediately adopted the Victorian Easter, as we know from a calendar (itself a copy) which was carried there from Corbie sometime before AD 657.⁵ Scholars have maintained that Columbanus's struggle was lost 'not only in the foreign waste places but in his native Bangor, the home of the sapient computists'.⁶ The evidence for this conclusion is

¹ Walker, 21-22; Gundlach, 156-60.

² 'Scias namque nostris magistris et Hibernicis antiquis philosophis et sapientissimis componendi calculi computariis Victorium non fuisse receptum, sed magis risu vel venia dignum quam auctoritate', Walker, 6; Gundlach, 157.

³ Walker, 12-23; Gundlach, 164-5.

⁴ 'plus credo traditioni patriae meae iuxta doctrinam et calculum octoginta quattuor annorum et Anatolium ab Eusebio ecclesiasticae historiae auctore episcopo et sancto catalogi scriptore Hieronymo laudatum Pascha celebrare', Walker, 18; Gundlach 162. On Anatolius see Krusch, *Studien*, 311-17, and Charles W. Jones (ed), *Bedae opera de temporibus*. Medieval Academy of America Publications 41 (Cambridge, Mass. 1943) 82-5.

⁵ Mac Carthy, *Annals of Ulster* IV (1901) cxxxii-iii. Prof. Wesley Stevens rightly cautioned me against a too-ready acceptance of the calendar evidence, since Mac Carthy was drawing on Krusch at this point, who in turn was depending on Ferdinand Piper, *Karls des Grossen Kalendarium und Ostertafel* (Berlin 1858) 62; Piper is not always reliable. But Columbanus himself (Ep IV=Walker, 26-8) warned his monks at Luxeuil: 'sed interim caute, ne sit inter uos qui unum uotum non habeat inter uos, quicumque ille fuerit; plus enim nobis nocuerunt qui apud nos unanimes non fuerunt' (italics mine). Moreover, we know also that Victorius was cited by Columbanus's biographer Jonas, c. AD 642, and also in the Milan, Biblioteca Ambrosiana, MS H 150 Inf, which is a computistical collection (containing much seventh-century material) deriving both from Bobbio and from Columbanus's Frankish foundations. Besides, after their founder's departure, the monks of Luxeuil must have comprised almost exclusively Franks whose commitment to the Irish 84-year cycle would have been dubious.

⁶ Jones, *Bedae opera*, 81, and others there cited.

a brief note bound in with an eighth-century Irish text (with ninth-century glosses) of the Gospel of Matthew, in the Würzburg, Universitätsbibliothek, MS M. p. th. f. 61.¹ The fragment is one of thirty intercalated slips which have been bound in with the Matthew text, but it bears no relation either to the Gospel or to the commentary. The note has never been satisfactorily edited in its entirety,² so I give here the full text with accompanying apparatus and a translation:

Mo-Sinu maccu Min, scriba et abbas Bennchuir, primus Hibernensium computum a Graeco quodam sapiente memoraliter didicit. Deinde Mo-Chuoróc maccu Neth Sémon, quem Romani doctorem totius mundi nominabant, alumnusque praefati scribae, in insula quae dicitur Crannach Dúin Lethglaisse hanc scientiam literas fixit, ne memoria laberetur.

ƒ . episinon .i. ui. ., Ƴ .cophe uel cosse., xc., ꝥenacosse., dcccc. Haec sunt notae tres, non literae. Sed tamen inseruntur apud Graecos inter literas, ne turbetur ordo numerorum ..,., „

- 1) bennchuir ... hebernensium 2) compotem ... dedit
3) mocuoroc maccumin semon 4) insola 5) -glaisse 8) numerf

¹ George Schepss, *Die ältesten Evangelienhandschriften der Universitätsbibliothek Würzburg* (Würzburg 1877) 26; Karl Köberlin 'Eine Würzburger Evangelienhandschrift (Mp. th. f. 61, S. 8)' *Programm zu dem Jahresb Kgl Studienanstalt St Anna in Augsburg Schuljahr 1890-1* (Augsburg 1891); 3-95: at p 48; Whitley Stokes 'Hibernica' *Z vergl Sprachforschung* 31 (1892) 232-55: at 245-6; Whitley Stokes and John Strachan (ed), *Thesaurus Palaeohibernicus, a collection of Old-Irish glosses, scholia, prose and verse*, (2 vols, Cambridge 1903; repr. Dublin 1975) ii, 285; Bernhard Bischoff and Josef Hofmann, *Libri Sancti Kyliani. Die Würzburger Schreibschule und die Dombibliothek im VIII. und IX. Jahrhundert*. Quellen und Forschungen zur Geschichte des Bistums und Hochstifts Würzburg 6 (Würzburg 1952) 99 No. 16. Elias A. Lowe, *Codices Latini Antiquiores* IX (Oxford 1959) No. 1415: 'Written in Ireland and partly glossed there in the centre where the Würzburg St. Paul [M. p. th. f. 12] originated. Other Irish glosses were probably added on the Continent'. There is a good facsimile in Georg Baesecke, *Der Vocabularius Sti Galli in der angelsächsischen Mission* (Halle 1933) Tafel 36; cf. 57 n. 1. My edition is based on a transcript that I made at Würzburg on March 16, 1978, which I have checked against an excellent photograph generously provided by Dr. G. Lehmann, University Librarian at Würzburg, and which is reproduced here with his permission.

² Baesecke's comment is worth noting here: 'Beim Photographieren von Bl. 33^a (Tafel 36) habe ich die eingeklebeten Zettel so gelegt, dass Nr. 29 mit dem Berichte über das griechische Studium von *Mosinu mac Cumin scriba et abbas Bennchuir* (Bangor) und *Mocuoroc mac Cumin Semon* sichtbar wird'. Unfortunately, the crucial lines of the text were *not* visible in his plate! It should be noted, however, that the arrangement of the slips has been altered since Baesecke's day (as Dr Lehmann kindly informs me).

'Mo-Sinu maccu Min, scholar and abbot of Bangor, was the first of the Irish who learned the computus by heart from a certain learned Greek. Afterwards, Mo-Chuoróc maccu Neth Sémon (*sic leg.*), whom the Romans¹ styled doctor of the whole world, and a pupil of the aforesaid scholar, in the island called Crannach of Downpatrick,² committed this knowledge to writing, lest it should fade from memory.

∫ 'episinon', that is six; Ÿ 'cophe' or 'cosse', [that is] ninety; ᚠ 'enacosse', [that is] nine hundred. These are three symbols, not letters. However, they are inserted by the Greeks among [their] letters, lest the sequence of numbers be disturbed'.

First the names: both of these men are known from other sources. Mo-Sinu maccu Min is the Sillán (Silnán), abbot of Bangor, whose death is recorded in the Annals of Ulster s. a. AD 609 [=AD 610]. He is listed fourth in the poem *in memoriam abbatum nostrorum* in the late-seventh-century Antiphonary of Bangor:

Amauit Christus Comgillum,
Bene et ipse Dominum,
Carum habuit Beognoum,
Domnum ornauit Aedeum,
Elegit sanctum Sinlanum,
Famosum mundi magistrum,
Quos conuocauit Dominus
Coelorum regni sedibus.³

¹ In a paper delivered at the International Colloquium: Ireland and Europe in the early Middle Ages II (Dublin, May 26, 1981) Dr Pádraig Ó Néill, University of North Carolina at Chapel Hill, made the interesting suggestion that the Romani represented a distinctive group among the seventh-century Irish writers in biblical exegesis, hagiography, canonical legislation and liturgy, as well as in the matters of the Easter controversy and the tonsure. E.g., in the Vatican, MS Palatinus Latinus 68, a Hiberno-Saxon psalm commentary compiled probably in Northumbria c. AD 700, the Romani are cited by name on three occasions as having a distinctive interpretation of certain psalms. Dr Ó Néill's suggestion seems to my mind preferable to that made by Mr Richard Sharpe (Cambridge) at the same Colloquium, that the use of the term implied support for the claims of Armagh to primacy in the Irish Church.

² Mac Carthy (*Annals of Ulster* IV, cxxxiv) identified the site as 'Cranny Island, in the south-western arm of Strangford Lough, a few miles from Downpatrick'. But according to Deirdre Flanagan 'The names of Downpatrick' *Dinnseanchas* 4/4 (1971) 89-112: at p 111 n. 39, no such site is recorded either in documents or in local tradition, and she refers to a paper by Fr Mc Keown, *Down & Connor Hist Soc J* 5, 33, who suggests Wood Island, Hollymount townland, west of Downpatrick.

³ See F. E. Warren (ed), *The Antiphonary of Bangor, an early Irish manuscript in the Ambrosian Library at Milan*, Henry Bradshaw Society Volumes 4, 10 (London 1893, 1895) i,

The name of the 'holy Sinlán, famous teacher of the world' suggests that he belonged to the Menraige, a north-east Munster people who are otherwise only rarely mentioned in historical sources.¹ *Mo-Chuoróc maccu Neth Sémon*, for his part, is mentioned in the Irish genealogical collections as *Mo-Chuaróc ind ecnai* ('M. the Wise'), of the Semuine, a tribe generally located in the copper-mining district of the Déisi (Co Waterford).² He is possibly the same man who is listed, under his proper name (*Mo-Chuoróc* being a pet form), as *Crónán sapiens* in the early Leinster genealogies.³ He is commemorated in the *Féilire Oénguso* (c. AD 800) on 9 Feb:

*Mo-Chuaróc ind ecnai,
noéb ná dāmair dígnac.*

'M. of the wisdom, a saint that endured not reproach'.⁴ One manuscript of the commentary of the *Féilire* says that he was also known as *Mo-Chuaróc nóna* ('of the None') because of a change in the observance of the canonical hours which he is said to have introduced.⁵ He was patron saint of Cell Chuaráin (Kilcoran) about a mile outside Youghal (Co Cork), where he was remembered in local tradition as 'Cuaran of the None' as late as the turn of the century.⁶ This is not the place to discuss *Mo-Chuoróc's* alleged liturgical innovation;⁷ it happens, however, that his epithet has been otherwise explained and it is to this alternative explanation that we now turn.

33. Dr Thomas Charles-Edwards 'The social background to Irish *peregrinatio*' *Celtica* 11 (1976) 43-59: at p 44 n. 3, suggested (correctly in my view) that the Sinilis whom Jonas refers to as Columbanus's teacher 'may well be identical with Sillán (<Sinlán, dimin. to Sinell, hypocoristic Mo-Sinu)'; such an identification would resolve what has hitherto been a textual crux in the *Vita Columbani*.

¹ See John Mac Neill 'Early Irish population groups: their nomenclature, classification, and chronology' *Proc Roy Ir Acad* (C) 29 (1911-12) 59-114: at p 79.

² See Michael A. O'Brien (ed), *Corpus genealogiarum Hiberniae* i (Dublin 1962; repr. 1976) 137: 'Seimni na nDéisse dia mbuí Mo-Chuaróc ind ecnai'; cf. 230: 'Clann Sem dia tá Semne na nDéisse de quibus Mo-Chuaróc ind ecnae'. The location stems from a mistaken belief that the tribal name Semuine derives from Old Irish *sem(m)* 'rivet'; cf. Mac Neill, 'Early Irish population groups' 81. It is perhaps worth noting, however, that Island Magee, near Larne (Co Antrim), is referred to in Old Irish sources as *rinn Semne*.

³ O'Brien, *Corpus*, 49: 'Dáre, cuius frater Crónán sapiens'.

⁴ See Whitley Stokes (ed), *Féilire Oéngusso. The martyrology of Oengus the culdee*. Henry Bradshaw Society Volume 29 (London 1905) 59.

⁵ Stokes, *Féilire*, 70: 'Is aire at-berar Mo-Chuaróc nóna fris, ar is é to ísech ro-delig celi-brad nóna, quia cum media & ora (sic) apud antiquos celebra[ba]tur'; the Latin passage is corrupt, see Mac Carthy, *Annals of Ulster* II (1893) 104-5.

⁶ According to Mac Carthy, *Annals of Ulster* II, 105. The connection of two possibly southern clerics with a monastery as far north as Bangor need not surprise us too much, for we know that Bangor had property in Leinster and Columbanus himself was a Leinsterman by birth.

⁷ See Paul Grosjean 'Recherches sur les débuts de la controverse pascale chez les Celtes'

Charles Jones, in his great studies of the Alexandrian Paschal cycle and its introduction into the West,¹ made the ingenious suggestion that the computus which Mo-Sinu maccu Min learned 'from a certain learned Greek', and which was subsequently committed to writing by his pupil, Mo-Chuoróc maccu Neth Sémon, was the mnemonic poem beginning *Nonae Aprilis norunt quinos*.² The poem consists of nineteen lines of doggerel verse, each line comprising two phrases of four or more syllables each, and each pair of phrases being interconnected either by alliteration or by assonance; there is no rhyme in the poem. For ease of reference, I give the text here with the mnemonic features indicated:

	Nonae Aprilis norunt quinos	V
	Octonae Kalende assim depromunt	I
	Idus Aprilis etiam sexis	VI
	Nonae quaternae namque dipondio	II
5	Item undenae ambiunt quinos	V
	Quatuor Idus capiunt ternos	III
	Ternae Kalendae titulant senos	VI
	Quatuordenae cubant in quadris	IV
	Septenae Idus septem eligunt	VII
10	Senae Kalendae sortiunt ternos	III
	Denae septenae donant assim	I
	Pridie Nonarum porro quaternis	IV
	Novenae Kalendae notantur septenis	VII
	Pridie Idus panditur quinis	V
15	Aprilis Kalendas unus exprimit	I
	Duodenae namque docte quaternis	IV
	Speciem quintam speramus duobus	II
	Quaternae Kalendae quinque coniciunt	V
	Quindenae tribus constant adeptis.	III

Analecta Bollandiana 64 (1946) 200-44: at p 220-5. This paper is to be read with caution.

¹ 'The Victorian and Dionysiac Paschal tables in the West' *Speculum* 9 (1934) 408-21: *Bedae opera*, 34-104.

² Karl Strecker (ed), *Poetae Latini aevi Carolini*, MGH, Poet Lat med aevi 4/2 (Berlin 1923; repr. 1964) 670-1. See also Charles W. Jones 'Carolingian aesthetics: why modular verse?' *Viator* 6 (1975) 309-40: esp. p 337-8. Grosjean, 'Recherches', 244, proposed to see the acrostics NOIN (i.e. Irish for *Nonae*) in the initials of the first four verses, and PASQQ at the end of the poem, and offered three criteria for classifying it as a Hiberno-Latin composition: 1) 'Dans l'évangélaire de Wurzburg, la note en question [sc. concerning Mo-Sinu] introduit-elle peut-être précisément ce petit poème? 2) Le système d'assonnances du poème...ne sont-ils pas un rappel de la métrique irlandaise...? 3) Enfin l'épithète 'de None' ajoutée au nom de Mo-Chuaróc, ne viendrait-elle pas, en dernière ana-

The first phrase in each line gives the date, in the Julian calendar, of the Easter full-moon in a particular year of the 19-year (decennovenal) cycle. The second phrase gives the so-called 'lunar regular', a number which, when combined with the 'concurrent' of the particular year, gives the day of the week on which the Easter full-moon falls. For example, the year AD 659 is the fourteenth year in the 19-year cycle ($659+1 \div 19=34$, remainder 14). In the poem, the first phrase in the fourteenth line gives as the Julian date for the Easter full-moon in that year *Pridie Idus* [Aprilis]=12 April. To find the day of the week on which that falls we combine the 'lunar regular' for the year (which the poem gives as *quinis*=5) with the 'concurrent' (=1), giving 6 = *feria sexta*=Friday. Thus the Easter full-moon in AD 659 occurred on Friday, 12 April; counting forward, it follows that Easter Sunday occurred on 14 April, *luna XVI*.

In simpler terms, what the poem contains is the data from two of the eight columns in an Alexandrian cycle for a period of nineteen years; and since in fact the Easter data recur in the same sequence every nineteen years the practical value of the verses is immediately obvious, for what might otherwise be calculable only with the aid of complex Easter tables could now, by means of these easily memorised verses, be computed by anyone with a minimum of technical expertise. So popular was the poem, in fact, that almost at once a legend arose claiming that an angel had handed it in writing to St Pachomius, the Egyptian author of the first monastic rule.¹ Because of the mnemonic nature of the composition, and because the data contained in it are those of the Dionysiac cycle, Jones (not unreasonably) concluded that this was the computus that Mo-Sinu maccu Míin had learned by heart, and he further surmised that it was from a member of the Augustinian mission to England that he had received it.²

Père Paul Grosjean, following a similar line of reasoning,³ sought to add

lyse, du *Nonae aprilis*? I am not competent to answer the second question, but the present study provides a firm *No* in answer to the other two. Jones described the poem as a 'Teutonic verse form' and claimed Visigothic origin, c. AD 600.

¹ See Charles W. Jones 'A legend of St Pachomius' *Speculum* 18 (1943) 198-210.

² 'The Victorian and Dionysiac Paschal tables', 419, and again in subsequent studies. Cf. Mac Carthy *Annals of Ulster* IV, cxxxiv: 'The *computus* in question was, of course, the Alexandrine decemnovennial cycle'; Grosjean, 'Recherches' 228: 'Le sage grec dont Sillán de Bangor apprit par cœur la table pascale, couchée ensuite sur le parchemin par son disciple Mo-Chúaróc, serait en réalité Denys le Petit'.

³ In a 'note complémentaire' written in response to Jones's paper of 1943. Grosjean's note, p 244, reads very much as an after-thought, for having expended some six pages on Mo-Chuoróc's alleged liturgical innovation, he now proposed to see in Mo-Chuoróc's epithet the upshot of his alleged connection with the *Nonae Aprilis*; he can hardly have it both ways!

some weight to Jones's surmise by suggesting that Mo-Chuoróc maccu Neth Sémon had himself composed the verses and that it was from this alleged composition of the *Nonae Aprilis* that he had acquired his epithet 'Mo-Chuoróc of the None'. It was then, so the scenario goes, some time before the year AD 610 (the year of Mo-Sinu's death) that the Dionysiac cycle was introduced into Ireland.¹ Computists could well appreciate the importance of such a milestone in an otherwise poorly signposted terrain.

Unfortunately, none of these scholars was familiar with the entire text of the Würzburg note, but followed the earlier, incomplete transcripts by Schepss and the editors of the *Thesaurus Palaeohibernicus*. Of the four independent transcripts known to me only one, Köberlin's, gives lines 6–8 of the edition printed above; and Köberlin's text at this point is so hopelessly garbled as to be totally unintelligible.² But these four lines are the key to the question of what it was that Mo-Sinu maccu Min introduced into the school of Bangor. The writing at this point in the Würzburg note, though clearly by the same hand that wrote the rest of the text, is crabbed and awkward and the scribe clearly had difficulty understanding his exemplar, which, to judge from the linguistic and palaeographical indications, must have been a very old one, possibly even seventh-century.³ The text omitted by previous editors reads, again, as follows:

¹ Jones, *Beda's opera*, 82 n. 3, alone provides a motivation for the alleged change in the Bangor practice, in the letter of bishop Laurentius of Canterbury to the Irish in AD 604, reported in Bede's *Historia Ecclesiastica* II 4.

² I give here Köberlin's version of these few lines:

Epuus (vielleicht ἐχῶς) nonne (non) id est sextus (VI)? us cophe vel χοοιη (cosse), nonaginta unus duo de mille (IXCHM), ἐναχοιοιοιη (enacosse) nongenti (DCCCC), hae sunt natae, tres (III) non litterae sunt, sed tamen inseruntur apud (ap) Graecos + litteras ne turbetur ordo numerus.

Note that on slip 28, below the text here under discussion, there are two Old Irish glosses clearly visible. The gloss *to̅mm̅ē̅m̅ā̅id* (with 4 horizontal dashes indicating that it is Irish) stands over the Latin *Medius crepuit* (Act 1, 18)—Köberlin read this as *id est actorum memoria ait!* On the fourth line from the bottom of the same slip the Latin *Figuli* is glossed *.i. in̅ne c̅ērd̅ē uel uiri, qui imagines faciebant*, with *imagines* glossed *.i. delb̅ā*. Köberlin read all this as: *id est inanes facies dealbant vel uiri, qui imagines faciebant* (darüber geschr. *id est dealbare*)! These, and the other Old Irish glosses in the MS, were correctly identified by Bischoff 'Wendepunkte in der Geschichte der lateinischen Exegese im Frühmittelalter' *Sacris Erudiri* 6 (1954) 189–279=*Mittelalterliche Studien. Ausgewählte Aufsätze zur Schriftkunde und Literaturgeschichte* I (Stuttgart 1966) 205–73; at p 254. Linguistic and palaeographical considerations would suggest a seventh- or early eighth-century origin for the glosses.

³ The occurrence of the *maccu* formula in the note would alone be proof enough of antiquity; see Eoin Mac Neill 'Mocu, Maccu' *Ériu* 3 (1907) 42–9; at p 42: 'The latest contemporary use of the term in A. U. [Annals of Ulster] is at 690: 'Cronan mocu Chualnae abbas Bennchuir obiit'. It is therefore probable that *mocu* began to go out of use about 700'.

∫. episinon .i. ui. ., ∫..cophe uel cosse., xc., † enacosse., dcccc. Haec sunt notae tres, non literae. Sed tamen inseruntur apud Graecos inter literas, ne turbetur ordo numerorum..., ,

The first symbol was originally the Greek *Ϝ* (or similar) and therefore also called ‘digamma’ (i.e. double-gamma). Later, it assumed forms which were similar to the ligature of *o* and *c* in Byzantine manuscripts and it came then to be called ‘stigma’. The symbol is here referred to as *ἐπίσημον* (the *episinon* of the MS) literally ‘symbol’. The second symbol is the Greek *κόππα* (Q in the Phoenician alphabet), here rendered as *cophe uel cosse*,¹ another obsolete Greek letter denoting the number nine-hundred, otherwise *ἐναχόσιοι* (rendered as *enacosse* in the MS). The commentary states that ‘these are three signs, not letters. However, they are inserted among [their] letters by the Greeks, lest the order of numbers be disturbed’. What is this ‘order of numbers’? The reference is to a tract on finger-reckoning which occurs in some computistical manuscripts, including Bede’s *De temporum ratione*, cap. I, *De computo digitorum*.² To illustrate its use I give here the text as it stands in Bede, with a translation of his commentary:³

‘But it is possible likewise to learn and to do these things [sc. finger calculations] more easily with the computus and letters of the Greeks, who are not wont—like the Latins—to express their numbers by doubling [only] a few of these letters but rather, by using all the characters of the alphabet as figures for the numbers (representing the three extra numbers by peculiar symbols) and following almost the same sequence of numerical figuration as in the writing of the alphabet, thus:

A	I	H	VIII	Ξ	LX	Υ	CCCC
C	II	Θ	IX	Ο	LXX	Φ	D
Γ	III	I	X	Π	LXXX	Χ	DC
Δ	IV	K	XX	Ψ	XC	Ψ	DCC
E	V	Λ	XXX	P	C	Ω	DCCCC
Ζ	VI	M	XL	C	CC	↑	DCCCC
Z	VII	N	L	T	CCC		

¹ The confusion probably arose from the misreading of *coppe*, where the p’s were of the Irish minuscule type (shaft with s-shaped head), such as are clearly visible, e.g., in the Antiphony of Bangor, f 15v.

² Jones, *Beda opera*, 181.

³ ‘Sed haec graecorum computo literisque facilius disci simul atque agi possunt, qui non, ut latini, paucis hisdemque geminatis suos numeros solent exprimere literis; verum toto alphabeti sui caractere in numerorum figuras expenso, tres qui plus sunt numeros notis singulis depingunt, eundem pene numeri figurandi, quem scribendi alphabeti ordinem sequentes, hoc modo: . . . Qui et ideo mox numeros digitis significare didicerint, nulla interstante mora, literas quoque pariter hisdem praefigere sedunt.’ Jones, *Beda opera*, 181.

Therefore, those who have learnt how to represent numbers with their fingers know, without any intervening delay, how equally to represent letters also with these numbers'.¹ The system is relatively simple: Each letter in the Greek alphabet had also a numerical significance. The first nine letters denoted the numbers from one to nine—*alpha* one, *beta* two, *gamma* three, etc., with the obsolete *digamma* denoting six, and nine therefore represented by *theta*. After *iota* ten, the reckoning advanced by decades: *kappa* twenty, *lamda* thirty, and so on up to *pi* eighty and the obsolete *koppa* ninety. After *rho* 100, the reckoning advanced by hundreds, from *sigma* 200 up to *omega* 800, and the obsolete *sampi* for 900.

The numbers in the list are all that are required by the computist for calculations of almost limitless complexity. Most significant from our point of view, however, are the figures for the numbers 6, 90, and 900. These are the *tres [numeri] qui plus sunt* in Bede's words, which are here represented by the three obsolete letters of the Greek alphabet that we encountered already in the Würzburg note. The final link is provided by Bede's description of this chart as a computus Graecorum, for there can be no doubt that the computus which Mo-Sinu maccu Min learned by heart *a quodam Graeco sapiente* ||| was precisely this list of Greek numbers and their equivalents in Roman numerals.

A study of insular computistical manuscripts indicates that finger-calculation was a standard feature of Irish teaching, and there were at least four different versions of the Latin material in circulation before Bede's definitive treatment.² The text on which Bede most obviously drew was the version known as *Romana computatio*³ —not so-called because it derived directly from Rome but doubtless to distinguish it from the *computus Graecorum* that Mo-Sinu maccu Min had learned by heart. Though the tradition of finger-calculation was well-established in the classical authors,⁴ these Insular

¹ Paul Lejay 'Note sur un passage de Bède et sur un système de numération' *Compte rendu quatrième congrès scientifique internat catholiques*, 6^{me} sect, sciences philol (Fribourg 1898) 129-36, discusses the development of the system in computistical texts; however, his contention that the tabular form here discussed was invented by Hrabanus Maurus is clearly mistaken.

² See Jones, *Beda's pseudepigrapha: scientific writings falsely attributed to Bede* (Ithaca, New York 1939) 53-4, 106-8, and the discussion in *Beda's opera*, 329-31.

³ Jones, *Beda's pseudepigrapha*, Appendix, 106-8; see his discussion of the tract *ibid.*, 53-4, and *Beda's opera*, 329-32. Re-edited by him in *Beda's opera didascalica* 3, *Corpus Christianorum Series Latina* 123 C, 669-72.

⁴ There is a useful catalogue of classical commentators in Antonio Quacquarelli 'Ai margini dell' *actio: la loquela digitorum* (La rappresentazione dei numeri con la flessione delle dita in un prontuario trasmesso dal Beda), *Vetera Christianorum* 7/2 (1970) 199-224, and in Jones, *Beda's opera*, 329.

tracts are the first definite treatment of the subject in medieval Latin literature. The *Romana computatio*, like the *computatio Graecorum* of Bangor, was undoubtedly an oral tract in origin, composed for use in the schools. Its existence and circulation before Bede's time were inferred on textual and codicological grounds by Jones; but he overlooked the fact that in one computus, British Library, MS Cotton Caligula A XV (saec. VIII², northern France)¹—made up almost exclusively of pre-Bedan, insular tracts—a dating formula on f 70r gives the *annus praesens* of the original compilation as AD 688.² We may conclude, therefore, that the *Romana computatio* was at least a generation older than Bede's text, and maybe much older.

It is clear also from the capitula of the seventh-century Irish computus *De ratione temporum uel de compoto annali*³ that such a tract as occurs in Bede's DTR, cap. I, was a commonplace of the Irish schools, for one of the capitula reads: *Deinde etiam interrogare debemus quomodo numeri nominantur apud Graecos, ab uno usque ad mille, et myriades, et quae notae significant illos numeros apud Graecos.*⁴ The subsequent capitulum reads: *Necnon etiam scire nos oportet quae notae significant istos numeros, ab uno usque ad mille, et myriades, apud Latinos.* In fact, comparison with a transcript of Bede's own computus, Oxford, Bodleian Library, MS Bodley 309 (saec. XI, Vendôme) f 61v, leads us to just such a list of Greek numbers, from 1 to 10,000 (myriads), with their numerical and verbal equivalents.⁵ It is particularly significant that in this list, for the number 6, the Bodleian manuscript reads: *S Nota numeri episinon eka* (i.e. εξα?); and for the number 90 the form *cophe* occurs—exactly the same as the Würzburg manuscript's *cophe uel cosse*. But as the Oxford list extends only to the number 800 we cannot know what orthography the scribe would have had for the number 900. Nevertheless, we can be reasonably sure that he would have written it as *enacosse*, just as the Würzburg scribe did.

The rather garbled nature of the Greek in the Würzburg and Oxford manuscripts should not lead us to surmise that they are only poor copies of more correct seventh-century exemplars. Knowledge of Greek being what it was at

¹ See Elias A. Lowe, *Codices Latini Antiquiores* II (Oxford 1935; repr. 1972) 19, No. 13; Jones 'The 'lost' Sirmond manuscript of Bede's 'computus'' *Engl Hist Rev* 52 (1937) 204–19: at p 210–11.

² See Alfred Cordoliani 'A propos du premier chapitre du *De temporum ratione* de Bède' *Le Moyen Age* 54 (1948) 209–23.

³ The prologue and capitula of this computus were published by Jones, *Beda's opera*, Appendix 393–5: at p 393. I am presently engaged on a critical edition of the work.

⁴ Jones, *Beda's opera*, 393.

⁵ See Jones, *Eng Hist Rev* 52 (1937) 213. Note that the list of Greek numbers immediately precedes the prologue and capitula of the Irish Computus just referred to, which occurs in this MS in a good recension. Such lists are frequent in computistical MSS generally.

the time, we need expect no more than a fair approximation to the letters and their verbal equivalents. But the evidence of these two manuscripts, together with that of the capitula in the Irish computus, can leave us in no doubt that the new tract introduced into Bangor before AD 610 was no more and no less than a treatise on finger-reckoning.

But what of the *quodam Graecus sapiens* from whom Mo-Sinu is supposed to have acquired this tract? Bischoff¹ thought the reference was to one of the many Latin translations of Greek tracts which circulated in computistical manuscripts. More likely however, as it seems to me, the text concerned was a *littera formata* or authenticating document, common in the early Middle Ages as a 'passport' issued by bishops² to their clergy when despatching them on official business. In order to insure against forgery, official documents were provided with a code, best illustrated by the standard text known as the *Regula Formatarum*:³

Greca elementa litterarum numeros etiam exprimere nullus, qui uel tenuiter Greci sermonis noticiam habet, ignorat. Ne igitur in faciendis epistolis canonicis, quas mos Latinus formatas uocat, aliqua fraus falsitatis temere agi presumere tur, hoc a patribus CCCXVIII Nicea constitutis saluberrime inuentum est et constitutum, ut formatae epistolae hanc calculationis seu supputationis habeant rationem, id est: adsumantur in supputationem prima Greca elementa Patris et Filii et Spiritus sancti, hoc est *II YA*, quae elementa octogenerium, quadringentesimum et primum significat numeros, Petri quoque apostoli prima littera, id est *II*, qui numerus octuaginta significat, eius qui scribit epistolam prima littera, cui scribitur secunda littera, accipientis tertia littera, ciuitatis quoque de qua scribitur quarta et indictionis quaecumque est id temporis, id est qui fuerit numerus adsumatur. Atque ita his omnibus litteris Grecis, quae, ut diximus, numeros exprimunt, in unum ductis, unam quaecumque collecta fuerit summam epistola tenet. Hanc qui suscipit omnium cautela requirat expressam, addat praeterea separatim in epistola etiam nonagenarium et nonum numeros, qui secundum elementa significant: *AMHN*

The *Regula* clearly implies the use of the same Greek alphabetical number system as occurs in the computi, and lists of Greek letters with their numerical equivalents and instructions for their use frequently accompany the *Regula* in the manuscripts. Moreover, Bischoff has pointed out⁴ that in all periods of the Latin Church the Greek alphabet was used alongside the Latin in consecration ceremonies. Thus the consecrating bishop had to be able to

¹ 'Das griechische Element in der abendländischen Bildung des Mittelalters' *Byzantinische Zeitschrift* 44 (1951) 27-55=*Mittel. Stud.* ii (Stuttgart 1967) 246-75: at p 248 n. 11.

² See Clara Fabricius 'Die Litterae Formatae im Frühmittelalter' *Archiv für Urkundenforschung* 9 (1926) 39-86, 168-94.

³ Fabricius, 39-40.

⁴ 'Das griechische Element' *Mittelalterliche Studien* ii, 252.

inscribe both alphabets (in the shape of a St. Andrew's cross) on the floor of a new building. Such a standard requirement would explain the relatively widespread familiarity in the West with the Greek alphabet (the capitals at any rate), and the duty of inscribing the *litterae formatae* may also have encouraged its dissemination. It is perhaps conceivable that the system was introduced to Bangor c. AD 600 in the guise of just such a *littera*, perhaps even the letter of Laurentius of Canterbury (AD 604), as Jones suggested.

Where does this leave the theory that the Dionysiac cycle was introduced into Ireland by Mo-Sinu, before AD 610? The Bangor computus was clearly not the poem *Nonae Aprilis*, for what purpose could be served anyway by Mo-Chuoróc maccu Neth Sémon committing to writing a poem which was already mnemonic in construction, which has nothing to do with Greek, and which is no more intelligible for having been written down? We have seen that the tract received at Bangor was in all likelihood a table of Greek numbers, an *ordo numerorum*, as the words of the Würzburg note have it. Moreover, the subsequent history of the Paschal controversies in Ireland also suggests that so early a date as c. AD 610 for the first attestation of the Dionysiac cycle in northern Ireland would be surprising.

Bearing in mind that in AD 640 the Pope-elect was writing to the leading ecclesiastics of the northern Irish churches (among them, as I think, the abbot of Bangor)¹ admonishing them to abandon the 84-year cycle and to adopt the Alexandrian, it seems intrinsically unlikely that Bangor, alone of all the northern communities, should have already made the changeover. Columbanus's letter to Gregory the Great shows clearly that the Bangor community were practised in computistical matters and entirely confident of their own abilities in the science. There is nothing to suggest that these staunch advocates of the 84-year cycle had been led already by the year AD 610 to abandon their mode of reckoning in favour of the 19-year Alexandrian cycle. On the contrary, the evidence of Cummian's famous Paschal letter² clearly implies that the change in Irish practice came about first in the south, and probably because of the letter of Pope Honorius which had been

¹ See Charles Plummer (ed), *Venerabilis Baedae opera historica* (2 vols, Oxford 1896; repr. 1969) i, 123 and ii, 112-13 [Historia Ecclesiastica II 19]; Maurice P. Sheehy (ed), *Pontificia Hibernica, medieval papal chancery documents concerning Ireland, 640-1261*, i (Dublin 1962) 3-4, No. 1. Plummer's hesitant identification of the Baétán mentioned in the letter as abbot of Bangor was probably not correct. See the comments of M. O. Anderson, *Kings and kingship in early Scotland* (Edinburgh 1973) 23.

² See James F. Kenney, *The sources for the early history of Ireland, an introduction and guide*, i: Ecclesiastical. Columbia Records of Civilization (New York 1929; 3rd ed Dublin 1979) 220, No. 57, and Jones, *Beda's opera*, 89-99. A new edition of this important document by Maura Walsh and myself is in preparation.

received *c.* AD 629.¹ Bede—who was usually right in such matters—when writing about the beginnings of the Irish mission to Northumbria, reported that ‘the Irish who lived in the southern part of Ireland had long since learned to observe Easter according to the canonical custom, on the admonition of the Pope’.² The northern Irish churches clearly persevered in their ways, and neither the Würzburg note nor any other evidence permits us to single out Bangor as an exception.³

¹ Described by Bede, *Historia Ecclesiastica* II 19, as ‘Sollerter exhortans, ne paucitatem suam in extremis terrae finibus constitutam, sapientiorem antiquis sive modernis, quae per orbem erant, Christi ecclesiis aestimarent; neve contra paschales computos et decreta synodalia totius orbis pontificum aliud pascha celebrarent’. Plummer, i, 122.

² *Historia Ecclesiastica* II 3: ‘Porro gentes Scottorum quae in australibus Hiberniae insulae partibus morabantur, iam dudum ad admonitionem apostolicae sedis antistitis, pascha canonico ritu observare didicerunt’. Plummer, i, 131.

³ I wish to thank Professor Wesley Stevens, University of Winnipeg, Canada, and Professor Gearóid Mac Niocaill, Galway, who read a draft of this paper and made helpful suggestions for its improvement.

Hiberno-Latin *calcenterus*

In his edition of the *Sancti Columbanii opera*, *Scriptores Latini Hiberniae* 2 (Dublin 1957; repr 1970) 2, G. S. M. Walker offered the following text of *Ep* I 3: 'Quid ergo dicis de pascha vigesima prima aut vigesima secunda lunae, quod iam ... non esse pascha ... a multis comprobatur calcenteris'. Walker emended the forms *calcalenteris* and *cacalenteris* of the only two surviving transcripts of the letter and rendered the form *calcenteris* as 'laborious scholars', basing both emendation and translation on Du Cange, *Glossarium mediae et infimae Latinitatis* (10 vols, Niort 1883-7) s.v. *Calcalenteris*.

J. W. Smit, *Studies on the language and style of Columba the Younger (Columbanus)* (Amsterdam 1971) 70-7 has a detailed and valuable discussion of this Columbanian usage. He asks: 'Could it be possible that, for the Irish, the word *calcenterus* evoked a writer who had formulated a particular, authoritative opinion on the dating of Easter?'. In fact, the term *calcenterus* does occur in a number of seventh-century Irish tracts with the meaning 'computist'. Thus, for example, in a southern-Irish collection of AD 658, the following is found: 'Sciendum cur hanc rationem [sc. the computation of the year as having 360+5 days] proprie tenuerunt. Hoc ita est, de quo iure alius *calcenterus* hoc modo dicens inquit,' etc. (Oxford, Bodleian Library, MS Bodley 309, f 45v). So also in Munich, Bayerische Staatsbibliothek, Clm 14456, f 21r: 'Per quod inuenitur [bissextus]? Per artem numerationis insignis ciuilibus. Apud *calcentores* 'aigis' uocatur,' etc. This example was overlooked by Walker and Smit, though it had been noted by B. Mac Carthy, *Annals of Ulster* IV (Dublin 1901) cxix-cxx, who in fact had anticipated Smit's theory. Smit and Mac Carthy referred to the Pseudo-Anatolian *Canon paschalis*, a sixth-century Irish (?) forgery which is cited by Columbanus. Pseudo-Anatolius mentions Origen specifically as an authority on the dating of Easter: 'Sed et Origenis (*sic*) omnium eruditissimus et calculi componendi perspicacissimus, quippe qui et *Calcenterus* vocatus est, libellum de pascha luculentissime edidit'. (B. Krusch (ed), *Studien zur christlich-mittelalterlichen Chronologie* [1] (Leipzig 1880) 317). Mac Carthy remarked that 'evidently the writer took *Calcenterus* to signify *calculator*.' So also Columbanus in his *Ep* I, and Cummian in his letter to Ségéne of Iona (c. AD 632), who refers also to a tract of Origenus Calcenterus on the subject of Easter.

Smit has shown that the term most likely derives from Jerome's comparison of Origen with the Alexandrian grammarian Didymus, to whom the Greek epithet *χαλκέντερος* ('with bronze entrails') had become attached in

recognition of his enormous literary activity. Jerome twice refers to Origen as *noster Chalcenterus* (*Ep* XXXIII 4, *CSEL* 54/2, 40. 7; *Ep* XLIII 1, *ibid.*, 92. 25); Rufinus adopted the usage also in his *Apologia adu. Hieronimum* II 24 (*CCSL* 20, 100. 7 ff.): ‘...istum quem modo *Chalcenterum* tuum uocas et pro merito laboris laudabilis ais *Adamantium* nominatum’. From one or other of these sources, doubtless, the author of the Pseudo-Anatolian *Canon paschalis* derived his usage, and Cummián in turn refers to *Origenus Calcenterus et uere Adamantinus*. According to Mac Carthy, ‘Cummián perhaps knew the meaning’. The form in Columbanus’s *Ep* I implies that the term was already common currency with the Irish in his time, and it came to denote any (but particularly a Greek) computist.

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Máeláin Muilchi

In *Tochmarc Emire* (Van Hamel, 1933, 37) it is said of Gort na Mórrígnae (viz Óchtar nÉdmainn) that in the year one or more of her kinsmen were slain, the field of the Mórrígain, as a result of this deed, only brought forth *máeláin muilchi*. As I have pointed out elsewhere (*Verh K Ned Akad Wet*, Afd Lettkd, n. r. 107 (1980) 226), the name *máeláin muilchi* already occurs in the Old Irish glosses on Philargyrus (Stokes and Strachan, 1901–03, ii 46.16 and 48.26; 361.13 and 363.24). This Latin commentary with its Irish glosses in the passage concerning Vergil’s *Bucolica* v 37 (*infelix lolium et steriles nascuntur avenae*) reads as follows: *Infelix lolium idest quia, qui lolium manducant, caecitatem patiuntur atque ideo ‘infelix’*. *Avenae idest maila muilchi vel cuinfec vel zizaniae* (Expl. 1); *Avenae idest mail molchi vel cuintbecha idest genus zizaniae* (Expl. 2; for both see Hagen, 1902, 97).

In this text *máeláin muilchi* and the Latin *zizania* seem to refer to *avenae* only, but in the Etymologies by Isidore of Seville, *zizania* is identified with *lolium*: *Zizania, quam poetae semper infelix lolium dicunt, quod sit inutile et infecundum* (xvii 9.106f). Apparently the distinction between *avenae* and *lolium* in this context was not absolute. The same uncertainty in colloquial names for these kinds of weeds can still be detected in the modern languages (for some German examples see *Verh K Ned Akad Wet*, loc. cit.).

Now it is striking to note that *zizania* appears in the so-called *Vita Prima* of St Brigit in a way which recalls *máeláin muilchi* in *Tochmarc Emire*. The

saint sees in a vision how Ireland is first ploughed and sown by sowers clad in white garments and how later black ploughmen arrive who destroy the good harvest and sow *zizania* instead. In the explanation given to her by St. Patrick, he and Brigit are ploughing the human hearts with the four Gospels and sowing the Word of God, but towards the fulfilment of the ages bad teachers will come in order to overthrow the good doctrine and to seduce mankind (*Acta SS Feb* I 125. 53).

Whereas elsewhere, in the law tracts and in a medical glossary (see *Dictionary of the Irish Language* s.v. *muilche*), *máeláin muilchi* refers to a certain kind of weed (perhaps *lolium temulentum*?) in a purely technical manner, in *Tochmarc Emire* the word seems to have acquired also a symbolical meaning: like the Latin *zizania* in the Latin life of Brigit, it is used as an expression of evil (To my knowledge, *zizania* first occurs in this special sense in Matthew XIII 25-30). I deem it therefore not unlikely that this particular element in our passage in *Tochmarc Emire* has ultimately a monastic origin.

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