

# The Reading *Computus* Manuscript: St John's College, Cambridge MS A 22

Anne Lawrence-Mathers

*University of Reading*

Before discussing the Reading *computus* manuscript itself, it is first important to establish the area of the monastery's life to which this manuscript was connected, since this subject has received relatively little attention in Anglophone scholarship. *Computus* played roles of great importance in medieval monastic life, but matches rather badly with modern scholarly disciplines. This is largely due to the fact that *computus*, in modern terms at least, appears as an intersecting set of areas of expertise and study, rather than a single discipline. At its core was the technical understanding of the astronomical, and related chronological, cycles of repeated movements and units whose complex structures made up the framework upon which the liturgical calendar of the Church and the seasonally-varying patterns of the monastic day were both constructed. More abstract than the calculation of hours, days and seasons, but still dependent upon the intellectual framework provided by *computus*, were the models of historical time and chronology which shaped perceptions of the eras of world history, and which constituted an important part of the intellectual context for the writing of chronicles.<sup>1</sup> At the more practical level, the patterns and cycles of time and the seasons were understood to affect all of the created world, including the human body, and thus computistical knowledge was closely linked both to medical treatment and to the growing of crops and herbs. All this meant that computistical texts could range in level and tone from short, practical expositions, frequently linked to diagrams and tables, to long and more theoretical works which brought together aspects of astronomy, time-calculation and arithmetic with complex theological arguments.

The theological complexities were in part the result of the layers of doctrinal decisions and of sometimes-competing observances and

traditions which converged upon the dating of the great feast of Easter and its associated set of moveable feasts. By the twelfth century the required rules for making the necessary calculations had long been established, and tables were in circulation which set out the dates of Easter down to the late sixteenth century. Nevertheless, each monastic house still expected to have at least one expert who could understand the calculations, and was able to make new applications based upon them if required. This in fact became both more important and more complex as new and more astronomically- and mathematically-correct models for calculating the movements of the planets became available in Western Europe across the twelfth century. Thus, while the calculation of Easter itself for any given year had ceased to be a matter of dispute or of mystery, some of the intellectual areas upon which *computus* touched were undergoing rapid development, and these innovations opened up new areas of controversy.

It was the complexity of the issues raised by the biblical accounts of Christ's Crucifixion which was especially problematic. All four gospels made it clear that the timing of the Crucifixion was closely tied to that of the Passover; but the information given by the synoptic gospels could not be precisely reconciled with that of John, and no gospel provided sufficient information to make dating of the event in relation to the Roman, Julian calendar and the recorded history of the Roman Empire a straightforward matter. The link between Easter and Passover meant that both the lunar and the solar calendar were involved in the relevant calculations; and at an early stage in Christianity's development it was also decided that the timing of Easter needed to be related to that of the vernal equinox in a very precise way.<sup>2</sup> Since there was not at first agreement as to exactly when in the Roman month of March this equinox took place further, technical and astronomical, debates needed to be resolved. Historians as well as theologians and astronomers became involved at least from the sixth century on, as Dionysius Exiguus' proposal of a new dating system for all Christians, calculated in relation to Christ's Incarnation, gained support. For this new dating system to work successfully it was clearly necessary for events recorded in both the biblical narrative and in secular histories to be calibrated in relation to the new era and to one another – and this too proved to raise complex and technical issues.

It was the fact that *computus* was imbricated in so many fundamental and contentious questions that made the achievement of the Venerable Bede, in resolving almost all of these problems and doing so with clarity and authority, so welcome. It appears that Bede taught *computus* to the monks of Wearmouth-Jarrow, and that his shorter textbook on the subject (*De temporibus*) was written for his students. However, he records in his longer textbook *De temporum ratione* (*The Reckoning of Time*) that it was written in response to the requests of his brethren for a fuller discussion of ‘the nature, course and end of time’.<sup>3</sup> The seriousness of the undertaking is shown when Bede goes on to say that he only embarked upon the task after ‘surveying the writings of the venerable Fathers’ and carefully comparing the texts of the Bible offered by the Septuagint and Jerome’s ‘Hebrew Truth’.<sup>4</sup> What Bede produced was a book which expounded first the different levels and modes of time, from the calculation of the units which make it up to the methods involved in constructing a calendar, and then moved on to the structures of both liturgical and historical time. Matters such as the correct date of the vernal equinox, the calculation of the age and astronomical position of the Moon on any given date, and the authority to be accorded to Dionysius’ dating system, were all authoritatively dealt with, and practical examples of selected observations and calculations were given.<sup>5</sup> The popularity of the work was further guaranteed when Bede went on to provide two technical ‘appendices’: a World Chronicle setting out the key figures and events of the Six Ages of the World; and an exposition of the Great Paschal Cycle, accompanied by a table of Easter dates for a full Cycle of 532 years. An idea of the labour involved, and of the usefulness of these achievements, is given when Bede asserts that, since his table begins with ‘the 532<sup>nd</sup> year of the Lord’s Incarnation’ and covers the years up to 1063, the user can ‘not only look forward to the present and future’ but can also look back and ‘clarify an ancient text’ by quick access to information on key characteristics of every year in the Cycle.<sup>6</sup>

The usefulness of Bede’s textbook ensured its popularity down to the eleventh century, and meant that it continued to be consulted until the end of the medieval period. This was not least because, as Bede himself explained, all salient details of the 532-year Great Paschal Cycle repeat, at least in theory, forever. Thus there was no need to panic in

1063, as all the calculations for 1064-1595 had in fact already been made, and only the numbers given to the years needed to be changed. However, Bede did not and could not resolve all of the problems associated with either *computus* or chronological accuracy; and his work was increasingly overtaken by gains in available knowledge, most particularly in astronomy and medicine. Thus, by the time of the foundation of Reading Abbey and the creation of its book collection, the range of texts and tables brought into the field of *computus* had grown considerably. It had become increasingly impossible, and undesirable, for any one work to cover all of the areas now involved. Thus, on the one hand, a range of ‘modern’ texts had been produced, each dealing with issues of greater technical complexity than did Bede; and on the other it had become customary for practitioners of *computus* to compile collections and selections of texts, diagrams, tables and technical accompaniments. These grew in number and complexity from the eleventh century on, and have become known by the name of ‘computistical collections’.<sup>7</sup> Their variability and their practical applications combined have led to an especially patchy survival pattern for such works, although some extremely impressive ‘display volumes’ do survive, including from twelfth-century England. Perhaps best known of these is the volume from Thorney, now Oxford, St John’s College, MS 17; but another good example is the related, computistical manuscript of c. 1122-35 from Peterborough, now British Library, Cotton MS Tiberius C I, ff. 2-17, and Harley MS 3667. High quality images and helpful commentaries on a late-twelfth-century English example, now Walters Art Museum MS W.73, are also available on their website.<sup>8</sup>

These developments mean that the inclusion of *computus* texts in lists of volumes primarily intended for the monastic *lectio divina* and the liturgy should not be assumed; and also that their categorisation when they do appear is rather variable. This is the case, for instance, in the mid-twelfth-century booklist of Durham which is included in the ‘Durham cantor’s book’ (now Durham, Cathedral Library MS B IV 24).<sup>9</sup> Here the complex medical and computistical collection which is now Durham, Cathedral Library MS Hunter 100 cannot be clearly identified, even though it appears to have been put together at Durham in the early twelfth century. As Piper notes, however, it appears in the late-fourteenth-century catalogue, where it is grouped with medical

volumes and is entered as *Liber de medicina, compoto, astronomia*.<sup>10</sup> By contrast, Bede's *De temporum ratione* (in two volumes) appears together with his theological commentaries in a prominent position within the list, on f. 2r of the manuscript. Interest in more recent computistical work is shown, but the priory's two copies of Gerland's magisterial, late-eleventh-century survey (and one of Helperic's popular, late-ninth-century, introductory textbook) appear in a considerably lower position, close to the textbooks on grammar.<sup>11</sup> It should, however, be noted that *De temporum ratione* is entered in a slightly smaller script than Bede's theological works (although in the same hand) and on what may have been originally a blank line in the list. This may suggest some uncertainty as to the placing of this volume. Moreover, this prominent position has been lost by the fourteenth century. Here the section containing Bede's works has not only dropped to a lower position amongst the Fathers but also no longer includes the *De temporum ratione*.<sup>12</sup> Indeed, all the computistical texts have disappeared, and no longer seem to be counted as part of the books for monastic reading and study.

Study of the Reading book collection itself in the first century of its existence, and of the place of the *computus* manuscript within it, is greatly helped by the existence of the booklist in the Reading Cartulary. This manuscript is now London, British Library, Egerton MS 3031.<sup>13</sup> It was begun in the 1190s, and is still in a medieval binding. Folios 8v – 10v contain the list of the books at Reading, with an additional list of books at the priory of Leominster on f. 12v. These are mostly in the main, late-twelfth-century hand, but were updated slightly in the thirteenth century. The booklist itself was first edited and published by Barfield in 1888, this being superseded by the full and carefully-annotated versions of Richard Sharpe and Alan Coates.<sup>14</sup> Plates 1 and 2 of Coates' very thorough work reproduce the booklists, and a transcription comprises Appendix A of the book (pages 25 – 37).

One feature of the list which deserves comment is the unusual degree of care with which the compiler sought to make it possible for users to keep track of both volumes and the texts which they contained. Where a volume appeared more than once (for instance in the cases of books whose contents were noted in the relevant section while a separate note identified their current possessor) this fact was mentioned

for the sake of clarity. The list opens, as was standard, with complete Bibles, followed by individual books of the Bible, volumes of decretals and copies of the *Sentences*.<sup>15</sup> The Fathers follow, with Augustine dominating as was usual. More surprising is that a near-contemporary, marginal addition places a set of additional volumes alongside Augustine's *super genesim ad litteram* and other, equally fundamental works. Those added are: the *Hexaemeron* of Basil (a somewhat rare work); an anonymous commentary on the Apocalypse; Isidore *de summo bono*; a glossed copy of the twelve minor prophets; the *Gesta* of King Henry; and a work titled *Ystoria Rading*. The high place thus accorded to the deeds of King Henry and the history of Reading could be accidental; but it is interesting that the list of the works of Jerome leads into a *Historia ecclesiastica* (presumably that of Eusebius) and then a volume described as *Cronica Eusebii Ieromini prosperi sigeberti monachi gemblacensis in uno volumine*. This is the world-history of Sigebert of Gembloux, in the 'edition' of Robert of Torigni.<sup>16</sup> Robert seems to have acquired his copy from Beauvais, probably in the 1140s.<sup>17</sup> The booklist then continues with Josephus, Hegesippus, Lives of Charlemagne, Alexander and the dukes of Normandy, and a History of the English (probably Bede's). Hrabanus Maurus then makes a brief appearance, before eight more entries for Bede. These begin with volumes of theological commentary, as would be expected; but then comes another surprise, since *De temporibus in uno volumine ubi etiam est compotus alberici* follows, preceding four further volumes of Bede's theological works. The *De temporibus* and *compotus alberici* can be identified with some confidence as the manuscript which is the main subject of this paper and which is now Cambridge, St John's College, MS A 22. The prominence of this volume in the list appears to be due to the relatively high status accorded to Bede. There are no other entries for computistical works, either at Reading itself or at Leominster, which suggests that practical assemblages of short texts and diagrams, in the possession of officials, may not be included in these formal lists.

Cambridge St John's MS A 22 is a rather plain but stately manuscript of 11.25 x 7.75 cm, and has 120 folios (and two flyleaves). It has the (later) Reading ownership inscription on f. ii and its identification is clear, even though it has none of the distinctive and easily-recognisable decorative motifs associated with the Reading

scriptorium. Coates has suggested that it was a very early member of the Reading collection, both because it is relatively early twelfth-century in appearance and because its hand has similarities to one found in another early Reading manuscript. The latter is now Cambridge, Mass., Harvard University, Houghton MS Typ. 194 H, and contains Rufinus' *Historia monachorum*, together with selected saints' lives and fundamental texts on the monastic life. This one, unlike the Bede, has recognisable 'Reading' initials and contains annotations by the scribe designated by Coates the 'Reading corrector'.<sup>18</sup> The computus manuscript has previously attracted more attention for the collection of short annals which it contains than for its computistical contents. These annals are found in the margins of the Paschal Tables on folios 111-118, which have 1132 as the first year included. Their content will be discussed below.<sup>19</sup> An important point here is that the annals, entered in several hands, cover events from 1135 (the death of Henry I) until the late fourteenth century (though very sparsely), showing that the manuscript continued to be known and used over a long period.

As was frequently the case, the Reading manuscript blurs the distinction between Bede's shorter work on time and this, longer one. The *Incipits* for the prologue and main text both use the title *liber de temporibus*, while the openings of the texts themselves show that this is the longer work now known as *De ratione temporum* (folios 1r and 2v). In this copy, Bede's important letter to Wicthed (here *Victeus*) on the subject of the equinox is appended to *De temporum ratione* (on folios 87v to 90r). It is not, as in some versions, inserted into the main text itself. The manuscript was examined by C. W. Jones for his edition of the text, and is his No. 43.<sup>20</sup> Its version of the text does not belong in any of the main textual groups which Jones identified; but, as he says, the popularity and wide distribution of the work, together with the loss of virtually all early, insular copies, make the construction of a clear stemma impossible. A distinctive characteristic of MS A 22's version of Bede's work is that it has a numbered list of 72 chapters (on folio 1v) but gives no headings for the chapters themselves. Jones points out that the list of chapters is in fact muddled, and that this feature is also found in some ninth-century continental manuscripts.<sup>21</sup> The error is traced by Jones back to an early, English archetype with an unclear chapter list, which caused various attempts at correction on the part of later scribes.

The text as found in MS A 22 belongs to a group in which the order of certain chapters has been changed to fit the chapter list. Some copies also altered certain chapter headings within the text; however the omission of chapter headings in the text of MS A 22 avoids this problem. The Reading copy is, as Jones states, closest in many ways to British Library, Royal MS 12 D IV, from Canterbury, which has the same incipit and the same problems with the list of chapters.<sup>22</sup>

This link to a manuscript from Canterbury is striking, given the preference shown in other early manuscripts and texts from Reading for deriving fundamental works from Cluniac sources. As is shown by the book list, for instance, Reading had the customs of Cluny and the Lives of its abbots.<sup>23</sup> The nature of the link to the Canterbury manuscript is therefore worth investigating further. Perhaps the most striking point is that the Canterbury manuscript, like the Reading one, brings together the work of Bede with that of Helperic, which was a surprisingly rare combination. Royal 12 D IV is datable by style to the early twelfth century and so is close in date to MS A 22 or perhaps slightly earlier. It has the ownership inscription of Christ Church, Canterbury. Its opening is very different from that of MS A 22, since it has a calendar with computistical information which begins on f. 4v, and Paschal tables for 1090-1402 beginning on f. 11v. These are followed by a table on the course of the Moon, on f. 16, and then by the work of Helperic on f. 17. Here the relationship between the two manuscripts emerges, as they have the same incipit with the same unusual version of the author's name: *Incipit prologus Albrici de compoto lunae*. Moreover, the text of Helperic has a worked example of a computistical calculation which was sometimes updated by 'editors' and both the Reading and the Canterbury copies have a date of 978 for this calculation.<sup>24</sup> The popularity of Helperic's work is shown by the fact that some 80 copies are known to survive, with calculations dating from 900 to 1151.<sup>25</sup> It is significant that Patrick McGurk has found that only five manuscripts give Helperic's name as Albricus, and that they all give his work the same title, give the date 978 for the calculation, and have the same 'edition' of the text itself.<sup>26</sup> This version was circulated, according to McGurk's findings, only in England and Normandy, and all the surviving copies are post-Conquest. Reading thus appears here to be part of a group of Anglo-Norman houses (which included St Albans and Lyre as well as Canterbury) rather than directly linked to Cluny.

It is now possible to go a little further, building on the findings of Jones and McGurk. Jones' very comprehensive examination of manuscripts of *De temporum ratione* associated the Reading copy with a group derived from an early, English exemplar, via intermediaries (probably continental) who attempted to correct the muddle in the chapter list. As stated above, the Canterbury copy now Royal 12 D IV belongs to the same group, and also has the 'Alberic' edition of Helperic's text. However, Jones also pointed out that the two codices have different versions of Bede's letter to Wicthed, with different incipits (and even different versions of Wicthed's name).<sup>27</sup> The Canterbury manuscript seems to have been influential in Southern England in the twelfth century, since both Jones and McGurk agree that a manuscript from St Albans, now British Library, Royal MS 12 F II, is a copy of it. The St Albans version copies the letter to Wicthed also, although curiously it gives no title to this text. The Reading volume thus shows what seems to be careful and independent editing in choosing a different exemplar for Bede's letter, and in the arrangement of its contents, although it does follow the Canterbury volume in its combination of texts.

It is worth noting that Cambridge, Corpus Christi College, MS 291, is another copy of *De temporum ratione* also from Canterbury. This one is probably from St Augustine's and also has Bede's letter, but omits Helperic in favour of a wider range of short pieces and extracts.<sup>28</sup> This volume does not have the same versions of Bede's texts as Royal 12 D IV and does not appear to have been used as an exemplar. It would thus seem that a new 'edition' became available early in the twelfth century and that this was accorded a relatively high status. A further point of some importance is that the Rochester library catalogue of 1123 has, as entry 66, a volume containing Bede *De temporibus* (the title usually given to the longer work in the medieval period), together with his letter to Wicthed and the *Computus* of Helperic.<sup>29</sup> This manuscript has not been identified and probably does not survive, and thus its exact relationship to the Canterbury and Reading manuscripts cannot be determined. However, this entry in a dated catalogue provides strong evidence that this influential combination of texts was in circulation in South East England before 1123.

That the combination of texts was known in Normandy, at least by 1163, is shown by the surviving copy of the Bec library catalogue (made at Mont St Michel c. 1163-4). Under the heading *Libri Bedae presbiteri*, this contains an entry (at number 78 in the modern edition) for: *de temporibus, liber I maior. Item epistola ipsius de equinoctio. In eodem liber abrici de compoto lune.*<sup>30</sup> Since the Bec manuscript does not appear to survive it is not possible to determine its place within this group, but it further strengthens the suggestion of an Anglo-Norman group of manuscripts containing this combination of texts. Equally significant is the evidence of Evreux, Bibliothèque Municipale, MS 60. This is a twelfth-century manuscript from Lyre of uncertain date which has some similarities in its treatment of its contents with the Christ Church manuscript. It opens with annals of Lyre, followed by an anonymous treatise on arithmetic and then by the *Libellus Albrici* (folio 13r) which is followed in turn by short computistical texts. Bede's work, with the usual heading, begins on folio 54r and is followed by his letter on the equinox, here addressed to 'Viched' (folio 136r). Examination of the English monastic library catalogues made available by the Corpus of Medieval British Libraries Project has not uncovered any other copies of this selection of texts, though others may remain to be discovered in Norman sources. The Reading manuscript can thus be stated to belong to a small group of codices, all originating in South East England and Normandy, and presumably of twelfth-century date (though all that is certain for the Rochester book is that it was pre-1123). Within this group, the copy belonging to Christ Church appears perhaps to have had a privileged position; yet the Reading copy shows an independent approach and access to other sources.

Evidence of the thought which went into the production of the Reading manuscript is provided not only by the main texts but also by the glosses. The extremely large body of glosses on Bede's work has not been edited in its entirety, and those of MS A 22 were not fully discussed by Jones. Comments on the glosses are thus tentative. However, they appear to be often in a hand slightly later than the main text, and to show concern for clarifying chosen points and avoiding problematic interpretations. For instance, in the preface of *De temporum ratione* Bede discusses the 'ancient chronographers' and their varying use of both the Vulgate and the biblical text produced by the 'Seventy Translators'. As Faith Wallis points out, this is an indirect

criticism of no less a figure than Eusebius.<sup>31</sup> However, the gloss at this point in MS A 22 simply says: *id est temporum scriptores* ('that is, the writers of those times'). A technical issue known as the 'leap of the Moon' is also carefully glossed. This first occurs in chapter 11, on the subject of the calendar months. Bede discusses the origin of these units of time and their close link to the Moon, before going on to the problem of the correct calculation of the length of lunar months. During this exposition he mentions in passing the 'leap of the Moon' but does not define it, before going on to explain how the differences in length between lunar and solar months accumulate across a solar year and need to be allowed for in the calculation of the Church calendar. The 'leap of the Moon' itself is not fully explained by Bede until rather later. The gloss to chapter 11 in MS A 22 supplies the helpful information that the term is the name given to the further adjustment of one day every nineteen years made necessary by a shortfall in the main correlation of lunar and solar months. A similar concern to avoid confusion appears in a gloss to the next chapter, where Bede handles the Roman months and the sources for their names and calculation. Here Bede, following Macrobius, refers several times to Numa; but the name Pompilius is also used. The gloss explains that they are in fact the same person.

Other additions in MS A 22 are longer, and deal with technicalities which arise in relation to Bede's text. For instance on f. 23v a text box in the margin contains a long note in relation to Bede's explanation in chapter 23 of how to use his table for making quick calculations of the age of the Moon (that is, the day of the lunar month). Bede notes that the results obtained by using the table may be disrupted when embolismic months (extra lunar months needed to correlate the lunar and solar calendars) are inserted. The marginal text notes that there is another problem, relating to the length of the inserted lunation and to its point of insertion in the solar month. A key point, according to the gloss, is that the relationship between the added day and the end of the lunar month needs to be handled carefully. Similar marginal notes continue to appear through much of Bede's text, though somewhat diminishing in frequency as it goes on. They do not all appear to be in the same hand; and some are headed *Glosa* but not all. That at least some were copied from the probably-lost exemplar is suggested by the

fact that several appear to be in the hand of the main scribe. Some, for instance that on f. 54r at the end of chapter 64, simply supply short passages missing from the main text. They are frequently emphasised by being ‘highlighted’ in red, and are clearly perceived as important. The same can be said of the glosses and additions to Bede’s letter to Wicthed (here Victeus), although there are fewer of them. In the case of the letter, the scribe also seems to have worked to ensure that the text ended exactly at the bottom of f. 90v. This was not entirely appreciated by the illuminator, who painted a four-line-high initial R at the beginning of the text although the scribe had left a space for it only two lines high, and who had to squeeze the explicit into the bottom line of f. 90v.

The text of Helperic (here Alberic) is treated in very much the same way as that of Bede in terms of both its *mise en page* and its earliest annotations. Interestingly, additions and annotations seem to have been made to this text over a longer period than those of the Bede, perhaps suggesting that this continued in practical use for longer. This suggests that *computus* was indeed taught and studied at Reading, as would be expected; but equally that this was done in an extremely conservative manner. As shown above, Helperic’s work was of late-ninth-century origin, and was already being superseded at Durham by the somewhat more up-to-date work of Gerland. The work is strongly pedagogic in tone, and begins, in the version chosen for the Reading manuscript, with a preface referring to the author’s experience of teaching young monks and attempting to aid their studies. Its opening initial in the Reading manuscript, a six-line-high red C on f. 91r, is old fashioned in appearance. This perhaps suggests both that the exemplar was respected and that the illuminator may have been copying it closely. If this is the case it may perhaps explain the over-sized initial for the letter to Wicthed, noted above, although it should also be noted that the illuminator/rubricator could make mistakes. There is at least one error in the numbering of the chapters, with chapter 31 wrongly numbered as 30. Nevertheless, care appears to have been taken once again by the scribe with the overall layout, and the text ends almost at the bottom of f. 110v.

Helperic’s work is followed, on f. 111r, by the tables for the Great Paschal Cycle, whose main hand is very similar to that of one of the annotators of *De temporum ratione*. However, it does not appear that there was any gap of time between the copying of the Bede and that of

the tables, since the text space and *mise en page* continue to follow the same pattern. These tables cannot simply be a copy of those in the Canterbury manuscript, since they cover a different span of years, and are for a full 532 year Great Cycle (1064-1595) following directly on from Bede's tables and using his calculations. By contrast, the Tables in Royal 12 D IV are placed early in the manuscript and cover only 1090-1402. The missing years would not be hard to supply, as long as a complete copy of Bede's work was available; but this does raise an interesting question as to whether Reading indeed had a collection of such practical materials, which has not survived.

It seems to have been envisaged from the start that additions, such as annals, could be made to these tables in MS A 22, since generous margins are allowed. The nature of, and reason for, their updating of the work of Bede is explained in the first column of the Tables themselves. This states that they follow the nineteen year cycles, as set out by Bede, but the numbers of the years are not those given by Bede. The next sentence helpfully gives the date on which they were drawn up, by saying that Bede's dates of the years (which ended in 1063) are no longer necessary *quia sumus in millesimo centesimo xxxii anno ab incarnatione Domini* (because we are in AD 1132). However the reader is assured that in all else the Tables remain the same, and that the first column contains the dates (as in Bede) the second the Indictions, the third the Epacts, the fourth the Concurrents, the fifth the lunar cycle, the sixth the date of *luna* 14 (the Paschal full Moon), the seventh the date of Easter itself, and the final column gives the age of the Moon on Easter Day. These are indeed the headings used by Bede, and in the same order.

It should perhaps be explained that Indictions were not strictly part of the calculation of Easter itself, but were an established method for keeping track of years in fifteen-year cycles. In contrast, Epacts and Concurrents were very much part of *computus*, and were ways of calculating, respectively, the 'age' of the Moon on 22 March in any year, and the day of the week on which 24 March would fall in any year. Both were important in the correct identification of Easter Sunday. The 'lunar cycle' number was also an important piece of information, since it located each year within the nineteen-year luni-solar cycles which made up the 532 years of the Great Cycle. The count was not as simple

as it might have been, since 532 (and thus 1064) were placed at number 17 in the series. The dates in columns six and seven speak for themselves; while the column for the age of the Moon gave the placing of Easter Sunday within the relevant lunar month.

The date of 1132 makes it perfectly possible that the Tables were drawn up in Reading itself, and thus that the new abbey contained at least one practitioner of *computus* capable of updating Bede's work and of writing the explanatory note on what he had done. This would fit with the care shown throughout the preceding texts, as noted above, since this computist would also be the most likely person to make use of this book in teaching his subject to pupils, as envisaged in the work of Helperic. It also accords with the space allowed for recording important events in both the abbey and the kingdom against the relevant years in the Tables. These 'annals' have been published.<sup>32</sup> However, they are too sparse to have the appearance of notes towards the composition of a full chronicle. Equally they deal with international events as well as local ones, and are unlikely to have any close relationship to the 'History of Reading' entered in the booklist. They are also significantly different from the annals entered into another Reading manuscript, now British Library Royal MS 8 E XVIII.<sup>33</sup> This is a copy of Smaragdus' *Diadema monachorum*, a classic text for monastic reading. The annals are on folios 94r-96v, are fuller than those in MS A 22, and are more closely focused on events in and concerning Reading.<sup>34</sup>

The events noted alongside the Tables of MS A 22 begin with the death of Henry I in 1135, and continue with the expedition to Jerusalem of the emperor and the king of France, in 1148. That they were the result of careful consideration is suggested by the phraseology of the entry for 1164. This records the dedication of Reading Abbey's church by Thomas Becket, and was clearly written well after the event, since it calls Becket 'St Thomas of Canterbury, archbishop and martyr'. The entries are made in various hands, and continue sporadically down to 1262 (on f. 112v). A long entry at the top of f. 113r suggests special emphasis placed on its contents; and it is also interesting that it has been erased. It spread across the years 1263-73, and concerned the defeat of Henry III at the battle of Lewes. At the least, this suggests scrutiny of the events entered and decisions as to whether they were suitable. That such care continued, if increasingly sporadically, is shown by the

existence of another erased entry on f. 114v, for 1374-77. An ongoing link to the concerns of *computus* is suggested by the fact that some entries contain astronomical details, although it must be confessed that these are few. The most detailed is the description of a partial solar eclipse in 1178 when, on the 28<sup>th</sup> day of the lunar month, the sun's disc was half obscured from the sixth to the seventh hour. Bede in *De temporum ratione* had quoted at length from Pliny, explaining that a solar eclipse takes place when the Moon passes between the Earth and the Sun, and that this can only happen when the Moon is new or just one day old. At 28 days the Moon is not quite new, and this would accord with the observation. The note of a solar eclipse in 1255 is much briefer, but demonstrates ongoing attention to such events.

The findings produced by this study of the Reading *computus* manuscript show that *computus* and the correct understanding of the calendar were studied and taught at Reading, as would be expected. The nature of this was highly conventional, and there is no sign of interest in the contemporary debates amongst computists and chroniclers over problems arising within the system of dating by the years of the Incarnation.<sup>35</sup> This is likely to be the result of deliberate choice, since the problems had been noted by Abbo of Fleury at the beginning of the eleventh century, and were a matter of fairly widespread concern amongst computists and chroniclers. The Lyre copy of the computistical collection under discussion does have a note at the end, on f. 139v, stating that the Nativity was accepted as having taken place in the penultimate year of a nineteen-year cycle, and with certain computistical data, but that unless 22 years are added the correct data for the Crucifixion will not be found.

The absence of an equivalent note in MS A 22 is not because the volume was little used, as is shown by the annotations and annals mentioned above. Moreover, an annotator in the early thirteenth century took the trouble to enter a long note on Easter onto the first flyleaf of MS A 22. This in part concerns the relationship between Easter and the feast of unleavened bread, and relates both to Matthew, chapter 26 and, more tentatively, to Peter Comestor's discussion of Matthew's text in his *Historia scholastica*.<sup>36</sup> The relationship to the main texts is clear, and it is significant that both the note and the *computus* volume were important enough for this material to be added to an

already old book. As discussed above, a similar, and long-lasting, respect for the volume and its embodiment of the ongoing link between liturgical and historical time is shown by the entries of major events alongside the Tables for the Great Cycle. Further evidence for ongoing use is provided by the technical notes, added in various hands, at the end of the volume, close to the somewhat old-fashioned lists of 'Egyptian days' and mnemonics relating to the months. Thus, the appearance of the volume itself shows that it was an early part of Reading's book collection, while the evidence set out above suggests that it continued in use well into the thirteenth century, and was still at least occasionally added to in the fourteenth century. This is in accordance with the evidence for the care taken in selecting and editing the texts in the collection. What is perhaps more surprising is that, for a book dealing with such an important aspect of the life of the new abbey, an exemplar derived from South East England or Normandy appears to have been preferred to one from Cluniac sources.

## Notes

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- 1 On this see D. Dumville, 'What is a Chronicle?', *The Medieval Chronicle: II*, ed. E. Kooper (Amsterdam and New York, 2002), pp. 1-27.
- 2 For some of the complexities caused in organising the Church year see J. Hill, 'Coping with Conflict: Lunar and Solar Cycles in the Liturgical Calendars', *Time and Eternity; the Medieval Discourse*, ed. G. Jaritz and G. Moreno-Riano (Turnhout, 2003), pp. 99-108. Fundamental discussion of the issues involved is given in S. C. McCluskey, *Astronomies and Cultures in Early Medieval Europe* (Cambridge, 2000).
- 3 *Bede: The Reckoning of Time*, trans. F. Wallis (Liverpool, 1999), p. 3.
- 4 *Ibid.*
- 5 For a clear survey of the complexities involved see *ibid.*, pp. xviii-lxxxv.
- 6 *Ibid.*, p. 156; for the Table see pp. 392-404.
- 7 For detailed commentary by Faith Wallis on an impressive example, now Oxford, St John's College, MS 17, see: <http://digital.library.mcgill.ca/ms-17/> (accessed 19/08/2016); for higher-quality images see: <http://www2.odl.ox.ac.uk/gsd1/cgi-bin/library?e=d-000-00---0stjohn01-00-0-0-0prompt-10---4-----0-11--1-en-50---20-about---00001-001-1-lisoZz-8859Zz-1-0&a=d&c=stjohn01&cl=CL1&d=stjohn001-aaa> (accessed 19/08/16).

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- 8 <http://thedigitalwalters.org/Data/WaltersManuscripts/html/W73/description.html> (accessed 19/08/16).
- 9 For discussion see A. Piper, 'The Durham Cantor's Book (Durham, Dean and Chapter Library, MS B.IV.24)', *Anglo-Norman Durham 1093-1193*, ed. D. W. Rollason, M. Harvey and M. Prestwich (Woodbridge, 1994), pp. 79-92.
- 10 See A. G. Watson, ed., *Supplement to the Second Edition* (of N. R. Ker, *Medieval Libraries of Great Britain*), Royal Historical Society (London, 1987), p. 28; and J. Raine and B. Botfield, *Catalogi Veteres Librorum Ecclesiae Cathedralis Dunelmensis*, Surtees Society 7 (1840 for 1838), p. 33 (entry 'A').
- 11 Raine and Botfield, *Catalogi*, p. 4. For Gerland's work see *Computus Gerlandi*, ed. A. Lohr, *Sudhoffs Archiv Beihefte* lxi (Stuttgart, 2013). There is no modern edition of Helperic, but a version of the text is given in *Patrologia Latina* 137, cols. 17-48. On the dissemination of the work see: L. Traube, 'Computus Helperici', *Neues Archiv* xviii (1893), 73-105; P. McGurk, 'Computus Helperici: Its Transmission in England in the Eleventh and Twelfth Centuries', *Medium Aevum* xliii (1974), 1-5.
- 12 *Ibid.*, p. 20.
- 13 For the account of the discovery see: S. Barfield, 'Lord Fingall's Cartulary of Reading Abbey', *English Historical Review* 3 (1888), 113-25, at 113-14; B. R. Kemp ed., *Reading Abbey Cartularies* 2 vols (London, 1986-7), I, p. 2 n. 1; A. Coates, *English Medieval Books: The Reading Abbey Collections from Foundation to Dispersal* (Oxford, 1999), p. 19.
- 14 R. Sharpe, J. P. Carley, R. M. Thomson and A. G. Watson, *English Benedictine Libraries: the Shorter Catalogues* (London, 1996), pp. 113-25. An online version is available at: [http://mlgb3.bodleian.ox.ac.uk/authortitle/medieval\\_catalogues/source/B/77/](http://mlgb3.bodleian.ox.ac.uk/authortitle/medieval_catalogues/source/B/77/) (accessed 29/08/2016).
- 15 The compiler takes care to note that two of the volumes titled as *Sentences* contain the expected work of Peter Lombard, and identifies the 'masters' who gave them to the abbey; he further makes it clear that a third volume of this title also contains a 'brief and useful' survey of biblical history as well as many short texts and extracts from various works, whilst still another is entitled *Sentences of the Fathers (sententiae patrum)* and is a volume of 'great usefulness'.
- 16 See L. Cleaver, 'History Books at Reading in the Twelfth Century' in this volume, pp. 26-29.
- 17 On this see D. Bates, 'Robert of Torigni and the *Historia Anglorum*', *The English and their Legacy, 900-1200: Essays in Honour of Ann Williams*,

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- ed. D. Roffe (Woodbridge, 2012), pp. 175-84, at 184; and L. Cleaver, in this volume.
- 18 Coates, *Medieval Books*, pp. 56, 147, 153
- 19 They were published by C. S. Previt -Orton, ‘Annales Radingenses posteriores’, *English Historical Review*, 37 (1922), 400-3.
- 20 C. W. Jones, ed., *Bedae venerabilis Opera*, Pars. VI.2, *De Temporum Ratione Liber*; Corpus Christianorum, Series Latina, CXXIII (Turnholt, 1975).
- 21 C. W. Jones ed., *Bedae Opera de Temporibus* (Cambridge, Mass., 1943), pp. 140-61. St John’s MS A 22 is here No. 28, p. 150.
- 22 Ibid.
- 23 See also N. Morgan, ‘The Calendar and Litany of Reading Abbey’ in this volume, pp. 91-95.
- 24 See McGurk, ‘Computus Helperici’.
- 25 S. C. McCluskey, *Astronomies and Cultures*, pp. 150-2.
- 26 McGurk, ‘Computus Helperici’, p. 2.
- 27 Jones ed., *de Temporibus*, pp. 150 and 153.
- 28 This manuscript may be examined via the Parker on the Web website: [http://dms.stanford.edu/catalog/CCC291\\_keywords](http://dms.stanford.edu/catalog/CCC291_keywords) (accessed 29/08/2016).
- 29 See [http://mlgb3.bodleian.ox.ac.uk/authortitle/medieval\\_catalogues/B77/](http://mlgb3.bodleian.ox.ac.uk/authortitle/medieval_catalogues/B77/) at B.77, 66a-c (accessed 29/08/2016).
- 30 ‘Tituli librorum Beccensis almarii’, *Patrologia Latina* 150, col. 774; and G. Nortier, *Les biblioth ques des abbayes b n dictines de Normandie* (Caen, 1966), pp. 62-8. The list is also edited in H. Omont, ed., *Catalogue G n rale de Manuscrits des Biblioth ques de France, D partements, Tome II* (Paris, 1888). I am extremely grateful to Laura Cleaver for drawing my attention to this catalogue entry.
- 31 *The Reckoning of Time*, trans. F. Wallis, p. 3.
- 32 Previt -Orton, ‘Annales Radingenses posteriores’.
- 33 Coates, *Medieval Books*, pp. 153-4.
- 34 They are published in F. Liebermann, ed., *Ungedruckte anglo-normannische Geschichtsquellen* (Strasbourg, 1879, reprinted 1966), pp. 9-12.
- 35 For more on this, and particularly on its reception in twelfth-century England, see A. Lawrence-Mathers, ‘Computus and Chronology in Anglo-Norman England’ forthcoming.
- 36 *Patrologia Latina* 198, col. 1614. On the work of Peter Comestor and its importance see M. J. Clark, *The Making of the Historia Scolastica, 1150-1200* (Toronto, 2015).