The Principles behind the Unusual

Easter Date in Spain on 21 March 577

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Because a small error in the beginning will become great in the end, there is no trivial data in history that is not worth correcting if it is found to be wrong. In itself the question of why in the year 577 Easter was celebrated on two different dates in a relatively small area, Gaul and the Iberian Peninsula, is interesting in the best case for a very limited number of individuals. If, however, viewed in a wider historical context, mistaken interpretations will lead to mistaken assumptions about the political and cultural circumstances of early medieval Spain. Misjudgment of the reasons of either party, Catholic or Arian, contains the danger of misunderstanding the proportion of forces influential in the society of the day. The correctly interpreted detail may also be significant in finding out more about the astronomy of this fascinating blend of cultures that existed on the Iberian Peninsula before the Muslim conquest.

The information that something was unusual about the Easter of 577 comes from St. Gregory of Tours. Writing about the history of Franks and thus also about interactions with the Visigothic kingdom in the territory of modern Spain, he writes:

> In this year there was a dispute about Easter. In Gaul, we in common with many other cities, celebrate the holy feast of Easter on 18 April. Others have agreed with the Spaniards in keeping the feast on 21 March.[1]

1 "Eo anno dubietas paschae fuit. In Gallis vero nos cum multis civitatibus XIIII kal. Mai. sanctum pascha celebramus: alii vero cum Spaniis XII k. Apr. sollemnitatem hanc tenuerunt." Gregory of Tours, "Historia Francorum" V, 17. *Monumenta Germaniae Historica: Scriptores Rerum Merovingiorum* I,1.

I will advance convincing evidence to prove that the Spanish date was neither chosen because it was supposed to fall on the equinox nor it is the result of Arian reckoning. Rather it was an attempt to underline the Catholic orientation of those responsible for deciding the day of the feast. This is the actual aim of my article.

Jones hinted about the possible solution of the equinox in an article in 1934 about the reception of Victorian and Dionysiac Paschal tables[2]. The article is excellent and most likely corrected some errors when published in the 1930´s. Nevertheless in this case the author concluded hastily, namely about Easter of 577. The possibility of an Arian Easter can easily arise because of the situation in sixth century Spain. The ruling elite was adhering to the Arian heresy and since their faith denied most of the dogmas of the Nicene synod they could easily have had own standards for the major feasts. Although I intend show extended criticism, I have to point out that the date of Easter 577 has not been a main subject of any article I know of; instead, the topic has only been touched upon slightly in some earlier studies.[3] My arguments against previous or possible solutions are mainly based on textual evidence, while the theory I offer rests upon the computistical principles gathered primarily from Isidore of Seville. I will also offer some interesting speculations based on simulations of astronomical events (mainly the position and age of the moon) made with Redshift 4 software.[4]

The case of the equinox

Charles W. Jones writing in *Speculum*[5] assumed that the date of 21 March was chosen as the day for celebrating Easter because the spring equinox was on the same date. In the otherwise excellent and very useful article that clarifies

[2] Charles W. Jones, "The Victorian and Dionysiac Paschal Tables in the West", *Speculum* Vol. 9, No. 4, pp. 408–421, (Oct. 1934).
[3] Cf. Stephen McCluskey, Computistical Knowledge in the Middle Ages. *Journal for the History of Astronom* Vol. 34, Part 2 (May 2003), 202.
[4] Redshift 4, Focus Multimedia Limited (1994–2000).
[5] Jones 1934.

several issues about the reception of the paschal tables, the author admits a complete surprise that the date was not found in any known table.

> …it is possible that Gregory wrote VII Kal. Mai (the canonical date) instead of XII Kal. Aprilis, although no such reading is extant. Otherwise we have no way of explaining the wholly unknown custom of the Spaniards of celebrating on the day of the equinox, a practice condemned in both East and West since the inception of the Church…[6]

Jones writes the above comment in a footnote. Obviously he is reluctant to seriously entertain the choosing of a reading unsupported by any existing text. If the difference could be made by a minor change, for example *XII Kal. Mai* instead of *XII Kal. Aprilis* or *XI Kal. Aprilis* instead of *XII Kal. Aprilis*, the possibility of scribal error would be more realistic. In the present situation we are simply forced to look for a different solution. Jones suggests the other solution in the quoted text: The equinox. Although this could be a real alternative since the date is too early compared to the earliest possible dates in known Paschal tables, as far as I know there is no evidence to support it. Basically it rests on the assumption that the Spaniards believed the equinox to fall on 21 March in accordance with the Alexandrine practice but there is no data to support that theory. On the contrary, there exist written sources that inform us that in the Iberian Peninsula the equinox was thought to fall on 25 March.

Isidore of Seville, well known for his interest in astronomical matters, clearly believed the date of 25 March to be the correct one. In his *Etymologies* he writes that the equinox is on *VIII Kal. Aprilis*[7] and in his *De Natura Rerum* the same date is written out in words, *octavo Kalendas Aprilis*.[8] Thus the possibility of mistaken copy is very small, the only existing variant being *octabo* instead of VIII in the previous work.

[6] Jones 1934, p. 412.
[7] *Isidori Hispalensis Episcopi Etymologiarum sive Originum Libri XX*, Oxford University Press, Oxford 1911, V, 34.
[8] "Isidori Hispalensis Episcopi Liber De Natura Rerum", J.-P. Migne, *Patrologia Latina* 83, Caput VIII.

In order to understand my certainty about only one date being a serious alternative we need to sidetrack and look into the methodology of the bishop. Isidore has the reasonable habit of presenting different theories and then opting for one. His decision in the favor of one or another solution is not always clear at first glance, one gets the impression that he wants to maintain impartiality, although if we compare different works his choice becomes obvious. The case of the tides illustrates my point but there are other, equally good examples too. In the *Etymologies* he explains the tides by submarine vents that either suck in or release water.[9] In his other work dealing extensively with natural phenomena another option is given in addition to this: The influence of the Moon.[10]Obviously he was aware of competing theories and he preferred the vent version. Although we know that the *Etymologies* is the later work, it is not always where the bishop of Seville will clearly express his preferences but sometimes the case is the opposite, the *De Natura Rerum* contains his personal favorite. In the case of equinoxes there is no alternative given, neither work mentions any other date to be considered, although there is a lot written in both about the custom of various nations reckoning the beginning of the year from different days.

Obviously Isidore of Seville was absolutely certain about the date. As we will see, Martin of Braga (c. 520–580) also clung to the old Roman calendar. They were not alone in that. Roughly around the time Isidore was writing these works, another Saint quarreled with the clergy of Gaul about the date of Easter. Part of the problem of St. Columban was his adherence to an already outdated equinox. We need not to concern ourselves with the strong tempered Irish monk beyond the fact that having the vernal equinox on 25 March was not unique to Spain alone.

Not that Isidore lacked more recent information. As Jones noted, he used a corrupted form of Dionysiac paschal tables in *Etymologies*.[11] He was obviously aware of the activities of Victorius of Aquitain, since in the same work he both mentioned Victorius by name and the different ways the Greeks and Romans have of figuring which day is Easter.

[9] *Etymologies*, XIII, 15.
[10] *De Natura Rerum*, Caput XL.
[11] Jones 1934, p. 415.

The Latins inquire the first moon of the month from 5 March to 3 April; if the fifteenth moon falls on Sunday, they move the pasha to the next. The Greeks inquire the first moon of the month from 8 March to 5 April and if the fifteenth moon falls on Sunday they celebrate the sacred Pascha.[12] This is pretty much the same as what Victorius wrote in his preface to the Paschal tables[13] only in shortened form. It seems very unlikely that the well-educated bishop of Seville did not notice the adoption of the Alexandrine equinox by some.

The already mentioned Martin of Braga wrote a short work about Easter computus in the year 572, called *De Pasha*.[14] Interestingly in it he refers to the custom in the recent past, *usque ante non multum tempus*, of the Gallic bishops celebrating Easter always on 25 March, the day of the vernal equinox according to the old Roman usage, but he does not agree with this practice. Instead, according to him Easter should be celebrated between 22 March and 21 April. While the date of Easter in the year 577 falls outside of the boundaries set by the archbishop of Braga, we have here another influential clergyman seeing no problem in keeping the most important Christian feast before the equinox. 21 March is not that far from the 22nd and we may have here some element of the unknown and elusive Spanish way of reckoning Easter: the possibility to celebrate it before the old Roman vernal equinox, 25 March. Although Martin did not explicitly mention the date of the equinox in this work we know with certainty that he was an adherent of the old Roman calendar from another source, *De Correctione Rusticorum*. According to him, since the right division must respect equality, the creation of the sun and moon on the fourth day in order to divide day from night must be done in the way so that there are equal numbers of hours of daylight and darkness. Thus the fourth day of creation was on the equinox, 25 March.[15]

[12] "Latini namque a III Non. Mart. usque in III Non. Apr. primi mensis lunam inquirunt; et si quinta decima luna die Dominico provenerit, in alium Dominicum pascha protrahunt. Geaeci primi mensis lunam ab VIII Id. Mart. usque in diem Non. Apr. observant; et si decima quinta luna die Dominico incurrerit, sanctum pascha celebrant." *Etymologies*, VI, 17.

[13] Victorii Aquitani Cursus Pashalis Annorum DXXXII, *Monumenta Germaniae Historica, Auctores antiquissimi*, IX, pp. 679–680.

[14] "Opusculum VII De Pasha", *Opera omnia*. New Haven 1950. The work is so short (two pages) that the reader will be referred to it in entirety.

[15] Martin of Braga, "De Correctione Rusticorum", *Opera omnia*. New Haven 1950, p. 10.

In the light of all this information we must conclude that there is no real reason to consider the decision to celebrate Easter in the year 577 on 21 March as being based on the date of the equinox. Two very influential writers, contemporaries an archbishop and a bishop, see no reason to mention the Alexandrine practice but remain faithful to the Roman calendar. It is even possible that they made a conscious decision. Both were well educated, and in contact with other parts of the world, Martin was born in Pannonia and arrived in Gallicia via Palestine and Isidore had contacts through his brother with Rome and Constantinople. They had the chance to acquire information about the custom of using Alexandrine dates and rejecting it as foreign practice. We only know with certainty that they did not mention an equinox falling on 21 March, not even Isidore, who otherwise had to gather lots of information for his writings.

The Arian Date

One could assume that since the date of Easter in 577 was neither 'Greek' nor 'Roman'[16] it had to be Arian in origin. Although this would be in some extent justified by the political and religious situation on the peninsula there are several problems with this assumption. First of all Gregory of Tours did not mention Arians in connection with Easter. The entire book of *Historia Francorum* is full of severe condemnation of the Arian heresy and their wicked behavior towards Catholics. It is unlikely that Gregory would have missed such an opportunity to boast about the superiority of his faith. If the date of 21 March was a heretical date, the bishop of Tours would not need to turn for justification to the miraculous springs of Osset. He could have immediately condemned the practice as heretical. Again, as it is clear from the passage cited not only Spaniards celebrated Easter on 21 March but some places in Gaul as well. It is hard to believe that entire cities or large groups of population would have been allowed to celebrate an Arian Easter in the territories of the Catholic Franks. Naturally there is a remote possibility that the "others" of the passage refer to the remnant Visigothic population of Aquitaine but I think, given Gregory's

[16] Jones 1934, p. 412.

dislike of the Visigoths, this would have been mentioned. Most likely, however, by this time even the descendants of the remnant population were Catholics.

We encounter another problem in Spain. Arianism was retreating and weakening around the second half of the sixth century. Only after 580 did King Leovegild organize a kind of religious counter-attack, albeit not a very successful one. Eventually even two of his sons turned Catholic, the rebel Hermenegild in the king's lifetime and Reccared immediately when he inherited the kingdom from his father. Estimates for the proportion of Gothic and native population vary, the only thing clear is that Goths formed a tiny minority, their number being frequently estimated 200,000, while the number of Hispano-Romans must be counted in millions.[17] Two major figures of the Catholic Church in the late sixth century were also Goths: Bishop Masona of Merida and the chronicler John of Biclar. Thus it was not only possible for a Goth to hold a position in the Catholic Church but also, as in the case of Masona, to even resist the attempts of the Arians to establish control over his city.[18] I find it unlikely that a minority church would impose its will on the majority on such important issue as the celebration of Easter without provoking angry comments from either contemporaries or from posterity. Finally there is the little but nevertheless vital Catholic kingdom of the Sueves in the north west of the peninsula. Certainly the famous Martin of Braga and his clergy would not, despite constant political pressure from the Visigothic kingdom, celebrate together with the heretics.

In fact we have no evidence whatsoever of Arians celebrating on different dates from Catholics. The three most important chroniclers of Visigothic, times are Hydatius, John of Biclar and Isidore of Seville. The first of these, Hydatius, wrote his work describing the main events of the years between 379 and 468 as a continuation of Jerome's chronicle. Twice he mentioned the feast of Easter, the first time in the year 451 just before the Gothic conquest and the other immediately after the invasion in the year 457.[19] Although the later date must be incorrect, since 28 March was not Sunday but Thursday, my point is clear:

[17] Judith Herrin, *The Formation of Christendom Princeton.* Princeton 1989, p. 221.
[18] *Vitas Sanctorum Patrum Emeretensium*. Brepols 1992, Caput V.
[19] "Hydatii Lemici Continuatio Chronicorum Hyeronymianorum", *Monumenta Germaniae Historica: Auctores Antiquissimi* XI. München 1981, p. 26, 30.

Not once in the almost hundred years covered by the author were Arian and Catholic Easters celebrated on different days. The same holds true for the other two writers. If such disagreement existed we have no explicit or implicit proof. All three authors Hydatius, John and Isidore were dogmatically and strongly committed. They used every opportunity to report the mischievous practice of the heretics. A different Easter day would certainly have been an excellent opportunity for them to rebuke the representatives of the wrong creed. No such information is known to us, the most likely explanation being that there was no such case at all. There is simply no plausible way of linking the unusual date with Arianism.

Local principles of computus

That there was more than one paschal table in use on the Iberian Peninsula is clear from the decree of the fourth council of Toledo in 633.[20] If Jones is right and the Victorian tables were indeed unknown in Spain at that time[21], the words of the decree de *solemnitatis paschalis varietas existere praedicationis* and *diversa observantia laterculorum* must refer to native modes of reckoning or the use of older tables based on an 84 year cycle but it is likely that several practices coexisted. As we have seen, the date of Easter in 577 cannot have been chosen because of the equinox, neither is it an Arian one. If we wish to reconstruct the principles behind the calculations that have lead to the unusual choice of 21 March our attention must turn to the writings of Isidore of Seville and Martin of Braga.

The common concern behind almost all methods of calculating the date of Easter and the resulting paschal table is that it needs to conform to the decisions of the council of Nicea. It is a widespread and mistaken idea repeated even in some respectable modern works that the council fixed the date to fall on the first Sunday after the full moon after the spring equinox. In reality no decision

[20] *Concilium Toletanum Quartum* V.

[21] Jones 1934, P. 416. There is, however, the problem of how to account for Isidore's knowledge of 'Greek' and 'Roman' Easters. It is possible, although not likely, that Isidore had access to the preface of Victorius without the actual tables.

can be traced with certainty to the Nicene council and all we have is secondary information, sometimes even contradictory, patched together from different writings originating in different places and thus reflecting the local tradition about the council rather than original information. The fact that the works of Eusebius contain eyewitnesses' accounts of the event does not necessarily mean that his writings were accepted as an undisputed authority on Easter. Although Isidore of Seville knew his works, he does not refer to them when discussing the Paschal feast. Similarly is the case with Martin of Braga. It seems very unlikely that the learned bishop did not know Eusebius. For some reason he chose to disregard the Cesarean bishop's report of Nicea about Easter and used different, unnamed authorities. One could speculate about whether this distrust of Eusebius in such important question was a result of his holding a Semi-Arian position at the council of Nicea, especially if one takes into account the situation in the Iberian Peninsula. The Visigothic king Leovegild did attempt to introduce a milder form of Arianism in order to win over as many Catholics as possible and, precisely because he had some initial success, his efforts were viewed with hostility by the determined and steadfast Catholic clergy. For such ecclesiastics as Isidore even a shadow of Arianism would mean that the author's ideas were at least doubtful.

What Isidore of Seville seems to know or find important about the decision of the synod about Easter amounts to little:

> The Church of old celebrated the Pascha on the fourteenth moon together with the Jews on whatever day it occurred. This rite was forbidden by the holy fathers at the Nicene synod and ordered that not only the paschal moon and month should be inquired but also the day of the resurrection of the Lord observed.[22]

In the same passage he writes that Easter should be celebrated from the fourteenth to the twenty first moons, thus not having any objection to having the feast on the fourteenth as long as it is on Sunday. It is worth to note that the

[22] "Antiquitus Ecclesia pascha quarta decima luna cum Iudaeis celebrabat, quocumque die occureret Quem ritum sancti Patres in Nicaena synodo prohibuerunt, constituentes non solum lunam paschalem et mensem inquirere, sed etiam et diem resurrectionis Dominicae observare." *Etymologies*, VI, 17, 10.

text is about the decision of Nicea and not about personal opinions of the bishop. Martin of Braga seems to have received his knowledge along the same line of tradition, for he also speaks about celebrating on the fourteenth moon if that falls on Sunday. Of course as this rarely happens, the limit must be extended from 14 to 21.[23] Neither author mentioned even a word about the connection between the equinox and Easter. The reason why Martin set the limit of not celebrating Easter before the twenty second of March is that according to him the Lord ate the Passover lamb with his disciples on that date, hence the resurrection cannot occur before the passion. And because from 22 March to 21 April is a full lunar month, Easter should fall within these limits. He did not propose any method of calculation beyond dogmatic instructions nor did he refer to any particular paschal table. The second council of Braga declared that the metropolitan bishop should announce the correct date and age of the moon every year and that the decision must be declared publicly after the reading of the Gospel on Christmas day in order to have sufficient time to prepare for Lent.[24] Of course in order to make a decision the metropolitan bishop had to have at his disposal some paschal tables. The paschal limits of Martin are different from the limits in the calculations of Victorius that are from 22 March to 24 April. He had to use other tables, being at that time himself the metropolitan bishop of the Suevic kingdom and bearing the responsibility for the decision. As McCluskey pointed out, although it is possible to determine the date of Easter with the help of annual observation of the moon at a date near the solstice, it is unlikely that it was ever used as an exclusive method.[25] Naturally this does not rule out the possibility of observation altogether as helping in obtaining the correct date. The Visigoths destroyed the Suevic kingdom in 585 but Braga continued as a metropolitan see. If there was a specific Easter cycle used by Martin, it most likely continued to be in use and perhaps it was one of the many observances referred to by the second council of Toledo.

As we have seen Isidore of Seville maintained the different dates for East and West when inquiring about the first moon, from 3 March to 5 April for the

[23] *De Pascha*.
[24] "Concilium Bracarense Secundum IX", J.-P. Migne, *Patrologia Latina* 84.
[25] Stephen C. McCluskey, *Astronomies and Cultures in Early Medieval Europe*. Cambridge 1998, p. 84.

Latins and 5 March to 8 April for the Greeks and this same division can be found in the preface of Victorian tables. Jones claims that Victorius took over the so called Latin limits from older Roman computations[26] and although it is irrelevant to the present discussion from where Isidore copied these limits from it would vindicate Victorius, who was often accused of creating a problem rather than solving one, if he had merely formed his tables according to reality and not being extremely arbitrary. The existence of the old Roman calculation and its use in different provinces in turbulent times justify the decision to include both Greek and Latin limits for the first moon. The tables were published in 457 – just a year before the Visigoths invaded Spain.[27] Only two decades before that the Vandals overran North Africa. In such a world no one could expect communications to work as in peaceful times and it was realistic to expect older methods to continue in places as possibly happened in Spain. Although making several mistakes as Jones pointed out[28], Victorius did his best to accommodate the situation.

The Catholics of Spain, in turn, did their best to have an Easter according to the requirements of Nicea and their tradition. They celebrated on Sunday, 21 March in 577. There is no reason to doubt that they had a similar practice at that time to the Suevic kingdom in announcing the Easter date around Christmas. In fact the same act of the fourth council of Toledo that informs of diverse observance of Paschal tables instructs the clergy to announce the feast before Epiphany.[29] As some cities in Gaul followed the lead of the Spaniards, there was sufficient time for information to travel both ways and for Spain to receive the word about the intention of Gaul to celebrate on 18 April. In this light it is difficult to accept the complete ignorance of Victorian tables, for the date held to be right by Gregory of Tours and others was certainly from the work of Victorius.[30] The date designated obviously for some reason did not satisfy the inhabitants of Iberia. Although by other standards their Easter might be wrong, all the information points to the direction that they perceived it to be a canonical one. The excerpt from Isidore's work lets us conclude with some

[26] Jones 1934, p. 409.
[27] McCluske 1998, p. 86.
[28] Jones 1934, p. 409.
[29] *Patrologia Latina* 84, V.
[30] *Monumenta Germaniae Historica: Auctores antiquissimi* IX, p. 686.

certainty the criteria that their tables might have been based on. The first of Nissan had to fall either between 3 March and 5 April or 5 March and 8 April. The Spanish most certainly did not see themselves as Greeks even in some symbolic way and given the enmity between the Visigothic kingdom and the Byzantine forces on the peninsula 'Latinity' had to be a strong sentiment. Even though the Arianism of the ruling Gothic elite was frowned upon, the chronicles nevertheless give a picture of strong patriotism. Thus it is plausible to assume the first moon being inquired according to Latin custom, from 3 March to 5 April and the native tables being built on the same principle. From the calculations of Victorius it is clear that according to him the first moon fell on 4 April, which will make the first moon of the Spanish date fall on 5 or 6 March and this is within the limits. As for the age of the moon at the very feast, again according to Isidore and in conformity to Nicea (and Martin of Braga confirms the principle) it must be from 14 to 21 days old. To make the matter slightly more complicated he also writes about the Latin practice of celebrating on the sixteenth to twenty-second moons and the Greek of celebrating on the fifteenth to twenty-first.

Unfortunately the date of 577 cannot solve the dilemma directly as to which of these practices was applied. Textual evidence is sufficient to conclude that the 'Greek' version is unlikely to be of decisive importance, so the tables had to be constructed on 14–21 or 16–22 bases. The first of these is the most likely choice, being for the Spanish the result of the wisdom of Nicene Fathers. If this is the case, the Spaniards had a native Paschal cycle based on old Roman tables and their best knowledge of the decrees of the synod in Nicea. Nor do we need to be bothered about subsequent years when there seems to have been common dates for Gaul and Spain. The metropolitan bishop made his decision annually so the next year he could have decided on another table. Or there is the possibility of the native Spanish table and the Victorian having an additional difference, the alternation of embolic and common years. The common year had, according to Isidore, 354 days, while the embolic 384. If between two Paschal fourteen moons there were 354 days, the year was common, if 384 embolic. Already common sense tells about the impossibility of having only common years, for the feast will occur earlier every year. The insertion of embolic years will return the date to within the proper limits. Naturally computing the dates of Easter and constructing a table is not that simple and in addition to the two types of years the insertion of bissextile years

are needed, plus the *saltus*, the insertion of some days during the cycle.[31] Without doubt the year between Easter of 577 and that of 578 must be embolic, for otherwise the feast would fall around the fifteenth of March at the latest and no method of computation will allow such an early celebration. The embolic year will on the other hand give an Easter date which is not only completely acceptable by the Spanish standard but is the same as in the Victorian table.

The case is similar with the preceding Easter too. The only difference between Victorian and Spanish tables would be the embolic year from the paschal full moon of 576 to moon of 577 in the first and a common year in the second. The examination of the Victorian tables will show no problematic years entirely like the one in question before and after half a century from the date of 577. The one possible exception is the Easter of 591 but it requires already a great deal of speculation. According to Victorius the date should be fifteenth of April. The first moon of the previous month would then be on the 2 March. It may be that, if there was such thing as a local table and if the Easter date of 18 March 591 was part of it at all, the place of the moon was simply calculated incorrectly so that the first moon was counted on 3 March.

I admit the argument about the possible mistaken reckoning of the moon would be very little justification for speculating if not for the fact that in another Paschal table, the *Paschale Campanum*, the information for the same year is unusual. While the date in Victorius is 15 April, in the other it is 16 March.[32] There is obviously a mistake in either copying the manuscript or writing the original but it is intriguing to realize that 16 March corresponds to the paschal fourteenth, full moon if the criteria of the inquires about the first moon, 3 March to 5 April are enforced. In that case Easter Sunday will be 18 March. The *Paschale Campanum* clearly originated in Italy, which fact is attested by both the editors and common sense, for example it informs about darkness in the vicinity of Vesuvius as a result of an eruption.[33] Nevertheless the coincidence is interesting.

[31] The calculations involved in constructing a table are explained in detail in Daniel McCarthy, *Easter Principles and a Lunar Cycle used by Fifth Century Christian Communities in the British Isles*, p. 4–7 [http//www.cs.tcd.ie].

[32] *Monumenta Germaniae Historica: Auctores antiquissimi* IX, p. 688 and p. 750.

[33] *Monumenta Germaniae Historica: Auctores antiquissimi* IX, p. 744 and p. 747.

The lack of physical existence of any manuscripts containing a native Iberian cycle represents a tiny difficulty in this theory but does not render it altogether impossible. After all there is the well-known case of the British Paschal *latercules*. Until the year 1985, when Ó Cróinín discovered an example of the tables in the Bibliotheca Antoniana in Padua, there were only secondary references and from these attempts were made to reconstruct the cycle.[34] The Spanish tables can be lost altogether or lurking in some archive, attached to other manuscripts. It is very tempting to conclude that such tables did exist and may still be available for a persistent researcher, for the date is unique but still fitting well into criteria about Easter dates that can be gathered from authoritative sources from the Iberian peninsula. The *Kalendarium Gothicum* from the collection of liturgical texts under the names of Ildefonsus and Isidore but actually of later date is a good example of a document containing clues about earlier tables.[35] The calendar is a list of festive days of the ecclesiastical year. It is also an aid for determining the date of Easter with the help of the golden number and the dominical letter. It is certainly more recent than the 6th century, for the original was most likely written in Gothic script[36] that came into existence in the late seventh century. The golden number will give the Easter date according to a 19-year cycle and the date of 577 cannot be found in the *Kalendarium*. Nevertheless the document contains an interesting anomaly compared to the 19-year cycles. The number of days in the lunar year is given as 353 instead of the customary 354. This could be attributed to the scribal error of marking the lunar number in February as 27 instead of 28 but the text clearly reads 28 for calendar days of the second month but only 27 for lunar days. What makes this anomaly interesting is the possibility to construct an 84 year Easter cycle where 353 days are taken as the basic unit of calculation and the length of the lunar month in such a cycle will differ from the value of the real, astronomical, lunar month only insignificantly, by 0,000056 days. The cycle will contain 84 Easters and will end in the 7th month of the 85th year.[37] It is possible

[34] Daniel McCarthy, "Origin of the Latercus Paschal Cycle of the Insular Celtic Churches", *Cambrian medieval Celtic studies* Vol. 28 (1994), p. 25.

[35] *Patrologia Latina* 86, Col. 0037.

[36] *Patrologia Latina* 86, Col. 0043.

[37] The construction of the supposed tables involves some acrobatics with numbers but is not much more complicated than for example calculations involving the golden number. The basic unit is the

that the scribe copied an early calendar of festive days and saints from the period when the 84 year cycle was in use and he copied the 27 day February without understanding its incompatibility with the golden number technique. I must repeat that in reality no such cycle is known, nevertheless the possibility of having another element of peculiar native reckoning is exciting.

There remains to examine the unusual Easter of the year 577 with the help of astronomical software. Simulations of the phases of the moon and other celestial events will interestingly enough vindicate the Spanish choice despite the miraculous springs of Gregory of Tours. The fifteenth moon of the Victorian table was supposed to fall on Sunday while in reality it was the fourteenth that fell on Easter day. The tables calculated the calendar moon and not the observable first moon as the first of the month, nevertheless as the question is about simulations of possible observations and not calculations, the moon was the fourteenth counted from the appearance of the thin crescent of the new moon on 5 April. Celebrating on the fourteenth is not allowed by the calculations of Victorius and thus the feast is not really in accordance with the stated principles. The first moon of Spanish Easter is according to the simulations on 6 March. The fourteenth, full moon falls thus on 19 March and Easter Sunday will then be the sixteenth. Thus the date of the first moon of the Spaniards is at least as well within limits as the Victorian.

Although there is no word of the vernal equinox and its place in Paschal calculations in Isidore it is worth to note that in 577 the equinox fell in reality on 18 March and not on the accepted dates of either 21 or 25 March. In short, having at disposal computer simulations, astronomically (but also theologically) the Spanish Easter is correct. The first moon was observable just like it was required in Biblical times and it is within the required limits. The Sunday of 21 March was the sixteenth moon and it fell after the vernal equinox. Perfect case, the only problem being uncertainty about whether the people of Iberia in the sixth century could perceive the perfection of it. Naturally the

353 day year. 85x353=30005; after adding the customary 21 bissextile days it will be 30026. With the embolic months, together 930 days, the result is 30956. As this is too much, 8 days must be taken in order to arrive at 30948, full 1048 lunar months. 30948/1048=29.530534. Although the lunar month was counted to be 29,5 days long, more or less everyone involved with a calendar was aware that this does not correspond to reality, for in that case no *saltus* (subtraction of some days in the course of the entire cycle) would be required in calculations.

necessity of keeping Lent would prevent reliance on observations of the first Paschal moon but, ironically, the Easter date is still correct.

Concluding remarks

The objective of this article is to advance evidence in favor of the Spaniards celebrating a Catholic Easter. Both historical facts and criteria about Easter from the available sources will easily show that the date was not decided upon because of the equinox nor was it chosen under the influence of Arianism. The date of the equinox is 25 March in the Spanish sources and there is no mention of the Alexandrine date. Arianism was in retreat in the eight decade of the sixth century, the adherents of this heresy being numbered in hundreds of thousands against the millions of at least nominally Catholic. There is nothing in the writings of Isidore or the decisions of the councils known to them that would prevent the celebration of the greatest feast on 21 March. My speculations about the possible native Iberian tables rest on less secure foundation. Nevertheless the date had to be decided either by consulting tables or making observations and I find the tables the more likely explanation. It is possible that after the Visigothic conquest, when relations with the rest of the former Roman provinces became increasingly difficult to maintain the Spanish simply had to rely on native means of reckoning. The last certain Easter they had according to a common, possibly 84 year, cycle was the year 452. The chronicle of Hydatius did not mention the exact date but informs nevertheless about 'visa', appearances, in the sky during the days after Easter. The meteor shower Lyrids achieved its peak in that year on 22 April [38], while the Paschal table of Victorius gives for the same year 20 April as one of the two possible dates for the feast and computer simulations of moon phases confirm his result. As the tables were published in 457 the earlier date had to be from an older table. If this old cycle ended sometime after the Gothic conquest and at times when communications became difficult the local population had to compute for themselves. Isolation sometimes leads to original solutions and the unusual Easter day of 577 could be an outcome of an isolated practice. But even if the

[38] *Monumenta Germaniae Historica: Auctores Antiquissimi* XI, p. 26.

possibility of local tables seems more likely it is not to say that the results of computer simulation are far from interesting. Although it is rather difficult to imagine the Spanish clergy of the sixth century making precise observation not only about the age and position of the moon but the equinoxes also, we may never know. Maybe early medieval Spanish astronomy has some surprises to offer.

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