

CONFUSION AND MYTH IN THE GREGORIAN CALENDAR REFORM

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Calendar reform in Britain and Europe resulted in some popular myths which do not stand close scrutiny. It also caused (and causes) some real confusion, particularly in respect of the consistency of dating across state boundaries, some of which have been subject to very substantial changes since that time.

A popular question: how is 5 October 1582 in Italy, similar to 3 September 1752 in England? Answer: neither date exists. The papal bull, *Inter Gravissimas*, issued by Pope Gregory XIII, required that for the year 1582, 4 October was to be followed immediately by 15 October; ten days, 5 - 14 October, were to be removed from the calendar. The old calendar, in place since the time of Julius Caesar, ran slightly slower than the natural seasons; by 1582, the solstices and equinoxes were arriving ten days early. The real reason for the change though, was to introduce a common calendar throughout the Christian world, ensuring that churches everywhere celebrated Easter, a 'moveable feast', on the same day.

But there was a problem: since the Reformation, a sizeable part of Europe - including England - had become Protestant. Protestants were not well disposed to act on papal bulls, particularly since this one had its inception in the Counter-Reformation Council of Trent. Consequently, date confusion descended over Europe for the next four hundred years. Ironically, Queen Elizabeth I was in favour of calendar reform in spite of having been excommunicated by Pope Gregory's predecessor, but her Archbishop of Canterbury was not. Britain did not make the change until the reign of George II in 1752.

Even some Catholic countries were not happy with the ruling. The bull was issued on 24 February 1582, the year in which the change was to be enacted. There were barely six months available to make the necessary alterations, and calendars for the year had already been printed; that was the practical objection. Spiritually, the change was potentially far more disturbing; although the cycle of days, Monday, Tuesday, Wednesday etc. was unchanged, the Sabbath day being unaltered, the feast days, holy days (and eventually in England, quarter days), remained on the same *numerical* date; Christmas Day was still 25 December, The Annunciation (Lady Day) stayed on 25 March. Thus the actual feast day was now to be celebrated ten days earlier than before; of concern to devout Christians, was that prayers and offerings would henceforth take place on the 'wrong' day.

Nevertheless, Italy, Spain and Portugal made the changes in October 1582 as the bull required. Poland did too, albeit with unrest in Livonia, Dorpat and Pernau and fighting in Riga. France and Lorraine made the change in December - removing 10 to 19 December - following an edict from Henry III. In the Netherlands (which then included Belgium) the Catholic states - Brabant, Flanders, Holland, Hennegau (Hainaut) and some other southern provinces - lost Christmas that year, 21 December being followed by 1 January.

Elsewhere:

'Some parts of Austria moved to the new calendar in October of 1583, and others two months later ... Augsburg accepted the Gregorian Calendar in February of 1583, but Bavaria as a whole waited until October. Würzburg, Münster, and Mainz all moved to the new system in November, but each dropped a

different set of ten days. The Catholic portions of Switzerland changed to the Gregorian scheme on January 12/22 of 1584, which means that some cantons were split in their usage for over a century. Bohemia, Moravia, and the Parliament in Prague ... adopted the reform for Catholics in January of 1584.¹

Hungary made the change in 1587.

Some German Protestants were incandescent with rage at the bull; James Heerbrand published a piece in Tübingen in 1584 calling Pope Gregory the 'Roman Antichrist', whose authority was:

'from the Devil ... All his [the Pope's] loathsome and abominable errors, his sacrilegious and idol-worshipping practices, his vicious, perverse, and impious dogmas ...'

The reformed calendar was not finally adopted in Protestant Germany until 1700. Denmark (which then included Norway), also resisted change until 1700. In Sweden the alteration was chaotic; February 29 was omitted in 1700, not only keeping their calendar 10 days out of phase with the Gregorian but a day out of phase with the Julian Calendar and therefore different from everywhere else. In 1712 Sweden reverted to the Julian Calendar ... Finally in 1753 the country adopted the Gregorian Calendar.

The Orthodox Church had split from Rome in the 11th century, and it was hoped by the latter that the two could at least agree on calendar reform. A bungled approach from the Catholic Church apparently contributed to the eventual arrest and exile of the Patriarch of Constantinople, Jeremiah II Tranos, in view of his sympathy to the proposals; all hope of agreement was lost. Five centuries later, some of the Orthodox Churches still follow the Julian Calendar, some the Gregorian and some a mixture of the two. Consequently, states in which those churches held influence were very late in reforming their calendars: Bulgaria in 1916, Turkey and Russia in 1918, Yugoslavia and Romania in 1919 and Greece not until 1923.

The Calendar (New Style) Act 1750, was guided through the British Parliament by Philip Stanhope, fourth Earl of Chesterfield; it came into

effect in 1752. The basic provisions were fairly straightforward and brought the British calendar finally in line with most of the rest of Europe: 2 September 1752 would be followed by 14 September 1752, 11 days being removed from that year.² Religious feast days, including Christmas Day, saints' days and the four quarter days, moveable feasts excepted, remained on the same numerical date; thus they were all brought forward by 11 days. That the change was greeted with suspicion in some areas, is confirmed by the fact that even by the late 1820s, people in rural England were still referring to 'old' Michaelmas Day, which now fell on 10 October; 'new' Michaelmas Day, numerically unchanged, was on 29 September. Most regular fairs and markets, however, remained on the same 'natural' days; so, for example, a fair traditionally held on 13 August, would now be held on 24 August.

Instructions for the calculation of Easter were included, ensuring that Easter Day was celebrated on the same day as most of Europe. The act made it clear that any payment of rents, annuities, expiration of leases etc., should be made according to the original natural number of days had the act not come into force. In due course, this led to the beginning of the tax year being put back from 25 March to 6 April where it remains today. Also included was a note on the age of majority; henceforth anyone born less than 21 years before the act came into force had to wait an extra 11 days after their 21st birthday before they could enjoy the benefits that age provided.

There was one other provision, somewhat eclipsed by the famous 11 days, and that was a change in the formal start of the legal and ecclesiastical New Year:

'In England in the seventh century, and as late as the 13th, the year was reckoned from Christmas Day, but in the 12th century the Church in England began the year with the feast of the Annunciation of the Blessed Virgin ('Lady Day') on 25 March ... but in and since 1752 the civil year has begun with 1 January.'³

Before this change, 31 December 1750 was followed by 1 January 1750, and 24 March 1750 was followed by 25 March 1751; this pattern had

been the same since medieval times. The convention is very clear from parish records of the period in question; for the years leading up to the change, sometimes a date would be written 20 February 1750 O.S. (old style), sometimes 20 February 1751 N.S. (new style), sometimes 20 February 1750/51. To make matters worse, Scotland had changed the New Year to start on 1 January in 1600. There was, and remains, between England and Scotland an ambiguity of a year in the dating of events between the years 1600 and 1751 for any date between and including 1 January and 24 March.

The confusion is compounded across international borders. Although the move of the New Year from 25 March to 1 January was usually made at the same time as the Gregorian Calendar was adopted, a number of states had made the New Year change *before* they invoked the Gregorian reform. At least one, Tuscany, appeared not to have made it for another 170 years afterwards.⁴ Starting in 1522 when Venice adopted 1 January as the start of the year, until well into the 20th century, there was an ambiguity in the identification of the year between the months of January and March, together with an uncertainty of ten days, rising to 11 days in the 18th century, 12 days in the 19th century and 13 days in the twentieth. The German states changed the New Year in 1544, Spain, Portugal and the Roman Catholic Netherlands in 1556, Denmark and Sweden in 1559, France in 1564 and Lorraine in 1579.

For the historian trying to reconcile dates across international borders, this change in the position of New Year can cause real problems; for example, 25 December 1710 in England, was the same day as 5 January 1710 in Florence, and 5 January 1711 in Rome.

An understanding of when those ten or 11 days were excluded, together with knowledge of the start of the New Year, helps to clarify some popular ‘stories’. It is said in many histories of science, that Galileo died in the same year that Isaac Newton was born. This forms a nice symmetry; Newton used the results of Galileo’s experiments on mechanics, which he conducted after the Vatican forbade him to study astronomy,

in the construction of his ground-breaking equations of motion, and ultimately his discovery of the law of gravity. The biography by Richard Westfall, states that Isaac Newton was born on Christmas Day, 25 December 1642, according to the Julian Calendar then in use in England; that day, 25 December 1642, being 4 January 1643 in the Gregorian Calendar, as Westfall notes.⁵

Galileo’s elaborate tomb in the church of Santa Croce in Florence, declares that he lived for 78 years and died in the year 1641; it does not give the day or month, although the history books say that he died on 8 January 1642 at Arcetri in Tuscany. Tuscany operated the Gregorian Calendar, although it still regarded the New Year as starting on 25 March, so 8 January belonged to the previous year, consistent with the year of death on the tomb.

In the Gregorian Calendar, with New Year counted as 1 January, Galileo died in 1642, while Newton was born in 1643. Measured in the Julian Calendar, Galileo died on 29 December 1641 and Newton was born in December 1642. Either way, the books cannot be correct; Galileo’s death and Newton’s birth, although they were within 365 days of each other, did not occur in the same numerical year.

Galileo is, perhaps, most famous for being the first to turn a telescope to the heavens where he discovered the four ‘Galilean’ moons orbiting Jupiter. Initially, he named them ‘Cosimo’s stars’ after his one-time pupil Cosimo II de’ Medici, Grand Duke of Tuscany. But Galileo had a rival: a German astronomer, Simon Marius, working in Ansbach, subsequently published a book reporting that he had discovered Jupiter’s moons in 1609.⁶ His acknowledgment of Galileo’s ‘prior’ discovery, was somewhat double-edged:

[Jupiter’s moons were] ‘observed by me ... almost at the very same time, *or slightly before it*, at which Galileo first saw them in Italy ... The credit ... of the first discovery of these stars *in Italy* is deservedly assigned to Galileo ...’ [author’s italics]

Galileo (and subsequent historians) accused Marius of plagiarism, but it was his names for the

moons - which he says were suggested to him by Kepler - Io, Europa, Ganymede and Callisto, after Jupiter's lovers, that stuck. Galileo published the date on which he discovered Jupiter's moons, 7 January 1610, in his book *Siderius Nuncius, The Starry Messenger*. Simon Marius published his findings in full in 1614, claiming that he first saw the moons on 29 December 1609. Galileo made his observations in Padua, part of the Venetian Republic, and Venice had changed New Year to 1 January in 1522, and adopted the Gregorian Calendar in 1582. He pointed out that Marius was a 'Protestant heretic', working in Germany, where the Gregorian Calendar had not been accepted. Thus Marius' 29 December 1609 in Germany, was the same day as 8 January 1610 in Padua, one day *after* Galileo's first observations... Marius' book must have further enraged Galileo with the comment:

'... my earliest observations [of Jupiter's moons, were] taken in the autumn of 1609 ...'

This was significantly before December 1609.⁷ Galileo further accused Marius of

'trying to ornament himself with other people's work ... unblushingly [making] himself the author of things I had discovered ...'

And for good measure, he added that while they were both in Padua, Marius encouraged a pupil to publish and sign (as his own work) a description of Galileo's design and applications of a military compass, and then fled the city leaving the pupil to take the consequences.⁸

This is the 'authorized version' of events, but there seems to be a problem: Marius was working in Ansbach, near Nuremberg which is in Bavaria, and Catholic Bavaria, as noted above, had been one of the first German states to adopt the Gregorian Calendar in 1583. Did Marius after all scoop Galileo, since both of them were actually using the same calendar? The solution to this conundrum illustrates the pitfalls awaiting the unwary in trying to disentangle who was using which calendar and when in this period, particularly when the place of usage was Germany. In the 17th century, the country we call

Germany today, consisted of dozens of small states under the umbrella of the Holy Roman Empire - the 'First Reich'. One of these states was the Margravate of Brandenburg-Ansbach, ruled during Marius' time by the Margrave, Joachim Ernst, of the Hohenzollern family, and it was then not part of Bavaria.⁹ Joachim Ernst was a Protestant, and a religious map of the period shows an island of Protestantism centred on Ansbach and including Nuremberg.¹⁰ Furthermore, Marius in his book, although he was not absolutely unambiguous in respect of the date of first observation, talked about using the Julian Calendar for tabulating the motions of Jupiter's moons. He also mentioned the 'Prutenic' or Prussian tables of the positions of the planets which he probably used. These were published in 1551 and based on Copernicus' analysis of the solar system and would have been computed using the old Julian Calendar.

It seems then, that Marius very likely did present his findings measured using the old style Julian Calendar, and as such, really was pipped to the post by Galileo by a single day. There remains, though, the intriguing possibility that if he really did first observe Jupiter's moons in the 'autumn of 1609' as he claimed, he might, after all, have beaten Galileo by some weeks.

Of all aspects of the calendar reform in England, the most often repeated story is that of the famous riots; 'Give us back our eleven days' was said to be the cry. It was claimed that people were even killed in Bristol. It is somewhat disconcerting, therefore, to discover that these riots almost certainly never took place. Robert Poole has found that Hogarth's print 'An Election Entertainment', a satirical view of the 1754 general election in Oxfordshire, may have been at least partially to blame. The picture includes a discarded election placard containing the well-known slogan:

'We can conclude that the famous 'Give us our 11 days' placard in Hogarth's print is part of a composite satire on the ignorance and deceit of the electoral process, drawing upon printed propaganda rather than upon observed crowd behaviour ... it is not a depiction of a real calendar riot ...'¹¹



'An election entertainment', by William Hogarth. Sourced from Wikipedia.

This was the outcome of a careful study of sources used by various historians who reported the 'riots'. Poole noted that at least three other investigators had come to the same conclusion. It is certainly true that a scan of the 1752 newspapers in Britain contains no reports of riots against the new calendar.

Notes

1. 'The Civil Reception of the Gregorian Calendar', *Gregorian Reform of the Calendar*, Ed Coyne, Hosking & Pedersen, Vatican 1983. Several of the articles and references in this very useful book have been consulted for information.
2. The Gregorian change required that 'century' years, 1600, 1700 etc., should only be leap years if divisible by 400; thus 1600 was a leap year, 1700 and 1800 were not. Since in the Julian Calendar 1700 was a leap year, Britain had added the extra day in that year, and that day had to be subtracted along with the standard ten days, in order to bring it in line with the rest of Europe.
3. *Whitaker's Almanac*, 2014, p.1129.
4. Tuscany did not move the New Year to 1 January until 1751, *Whitaker's Almanac*, 2014, p.1129.
5. *The Life of Isaac Newton*, Richard Westfall, Cambridge University Press, 1993, p.1. Even Westfall commented that Newton was born in 1642, the year that Galileo died.
6. His actual name was Simon *Mayr*; Marius was his Latinized name, and the name by which he is best known.
7. *Mundus Jovialis, The World of Jupiter*; an English translation is published in *The Observatory* in four parts, September to December 1916, available from the NASA Astrophysics Data System and can be found online.
8. Galileo vented his ire in his book *Il Saggiatore, The Assayer*, of 1623. An English translation by Stillman Drake of the appropriate section can be found here: www.princeton.edu/~hos/h291/assayer.htm. Most of this was devoted to a rant against Orazio Grassi, a Jesuit astronomer, writing under the pseudonym 'Sarsi', who had gone into print about comets, and who, in Galileo's view was talking nonsense. Insults were traded and as it happened, Galileo's theories about comets were completely wrong.
9. A Margrave was a 'Military Governor of a medieval German border province', (Oxford English Dictionary). The Margravate, was the territory ruled by the margrave.
10. See for example the map section, pages x and xi, in *Germany*, Neil MacGregor, Allen Lane, 2014.
11. *Time's alteration*, Robert Poole, UCL Press, London, 1998, p.13.

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