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John Dee and the English Calendar: Science, Religion and Empire

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This paper deals with the English rejection of the Gregorian calendar in 1583, seeking to set this episode in its cultural, political and intellectual context. It concentrates particularly upon the work of John Dee, whose treatise of advice to the queen on the calendar reform is almost the only one of his major writings which has not (as far as I am aware) been studied in any depth in published writings. I argue that Dee's calendar treatise offers important insights into his natural philosophy and provides the keystone of his vision of empire. To match the paper to the purposes of ESH I have economised on detail and references. A version of this was presented on 29 February 1996 to the history seminar at the University of York, and I am grateful for the comments received there. It is now a draft section of a book for UCL Press provisionally entitled "Time's alteration: calendar reform in early modern England" (submission April 1997), which will deal with the episode more fully and which will (I hope) be improved by any feedback which this electronic version generates. I will be pleased to receive comments and references of every kind.

The Gregorian reform of the calendar is familiar to historians of the early modern period, if only through those little notes that precede almost every work on the period advising the reader about the conventions used in old style and new style dating. The bare outline of it is this. The calendar of the Roman empire - the Julian calendar - had been adopted by the Christian church at the council of Nicaea in AD 325, the first of the general councils of the church. The aim was to ensure that all Christians observe Easter at the same time, and thus to provide a basic unity in the church. Unfortunately the Julian measure of the year was eleven minutes too long, which error had accumulated by the sixteenth century to ten days. The lunar cycle used to determine the date of the full moon upon which Easter depended was also slightly wrong. These errors had been known about for centuries; indeed, Copernicus's *De Revolutionibus* (1543) had started out as a contribution to the project of calendar reform. The issue was only tackled, however, towards the end of the counter-reformation council of Trent, which may have had in mind a project similar to that of Nicaea: bringing a basic unity to a divided church on the basis of common observance of Christian festivals. The reform was propagated as a papal bull in 1582, which did three things: it introduced a new method of calculating Easter; it removed ten days from October 1582 to bring the calendar back to the same relation with the movements of the heavens which it had had at the time of Nicaea; and it modified the system of leap years to keep it there.[1]

The Gregorian calendar was accepted throughout the Roman catholic world, though usually at a different time than that envisaged in the papal bull and by civil decree. Most protestant countries rejected it, as they rejected the authority of the church of Rome. There was considerable controversy over the new calendar, and in lands where protestants and catholics were intermingled it caused great trouble; Bohemia's "kalenderstreit" was notorious. Some of the problems became known to English diplomats and privy counsellors, particularly secretary of state Walsingham, who received a copy of the bull in diplomatic correspondence.[2] Walsingham passed a copy of the papal bull and calendar to the court magus, John Dee, and asked him, on behalf of the privy council, for his opinion. What is interesting about the episode that followed is not that England (predictably) rejected the Gregorian reform, but rather how close she came to adopting it, and in particular the appeal which a distinctively English version of the calendar reform had in a period when both the identity of the Church of England and of the nascent British empire were beginning to be articulated.

Dee was the obvious choice as advisor. One of the leading scientific figures in England, and possessed of one of the largest private libraries in the country, he had a command of the latest astronomical learning (Copernicus included) as well as of current antiquarian and historical writing, both necessary for an understanding of the calendar issue. Dee was also a long-time associate of the Elizabethan regime. He had been imprisoned under Mary, had given astrological advice as to the date of the queen's coronation, had acted as agent for Walsingham, and with him was among the advocates of a "blue water" foreign policy combining protestant alliances with voyages of exploration and colonization.[3]

Dee clearly regarded the request as important, for he dropped everything to work on the problem and on 26 February delivered to Lord Treasurer Burghley a 62-page illuminated treatise, entitled: *A playne Discourse and humble Advise for our Gracious Queen Elizabeth, her most Excellent Majestie to peruse and consider, as concerning the needful Reformation of the Vulgar Kalendar for the civile years and daies accompting, or verifyng, according to the time truly spent.*[4] The *Playne discourse* had two parts: one scientific, one polemical. Dee began by explaining how the motions of the solar system were translated into the "vulgar kalendar". He compared the figures given for the length of the year by a number of astronomers from classical to modern times, finishing with Copernicus and the protestant Michael Maestlin, a strong critic of the Gregorian reform.[5] He concluded that the calendar had indeed slipped out of line by ten days since the time of the council of Nicaea, but more to the point that it had slipped by eleven days since the time of Christ. In the polemical section which followed the astronomical analysis, Dee developed this line of argument.

The Romanists have done verie imperfectly, in chosing and preferring the time of Nicene Councell, to be the principal marke, and foundation of reforming the Kalendar: Although that Nicene Councell ... ought chiefly of all Christians to be regarded & kept in memorie... Christians should regard his [Christ's] birth as the "Radix of Time" ...

An eleven-day alteration, to the time of Christ, rather than a ten-day alteration to the time of Nicaea, was needed, concluded Dee. This would best be done not in a single leap, as the pope proposed, but by deducting the eleven days in batches of two or three from the ends of the months May to September 1583, which would both minimize any disruption to contracts and covenants and avoid affecting the nominal date of any religious festival or of the Trinity legal term. The royal authority, he argued, was quite sufficient to alter the civil calendar.[6] England would be out of step with much of the continent but, insisted Dee, "the Gregorian negligence" was to blame for this, "not any our affected singularity, or insufficiency". England's difference could be turned to advantage. The queen, recommended Dee, should publish a special calendar for 1583, the "Annus Reformationis", followed in 1584 by a "Queen Elizabeth's perpetual Kalendar" for the next century or two accompanied by an appeal to all other countries to follow England's lead. Thus, before the Gregorian reform had widely taken root, England would lead a sort of protestant counter-reformation of the calendar whose patent truthfulness would in the end oblige even the pope to "embrace the veritie".

Burghley perused the treatise and was "inclined to think him in the right line" having proved his point "by a great number of good authorities, such as I think the Romanists cannot denie". Visiting Dee, he persuaded him to concede one crucial point:

He yeldeth for conformitye with the rest of the world to assent to the reformation of our Engleshe calender, with the abridgement of x. daies

onellie; so as the trewthe be denounced to the world that yt ought to be xj. dayes, hoping the trewthe will drawe the Romanestes and other partes of Christendome to take owt of their Calender hereafter the said odd daie.

Dee consented to let the matter be referred "by hir Majesties order to sum skilful men in this science, as Mr. Digges and others, to be called owt of the Universities". Burghley added that it was urgent, "for that it is requisite, for a secrett matter, to be reformed before November". [7]

Those consulted had impeccable protestant and Copernican credentials: Thomas Digges (also a former pupil of Dee and well known to Burghley); [8] Henry Savile, founder-to-be of Oxford's Savilean chairs of astronomy and geometry; [9] and "Mr Chambers", a progressive astronomer. [10] The scientists (claimed Burghley) agreed with Dee that eleven days would have been "the better reformation" but pointed out that the Gregorian reform was at least accurate to the time of the council of Nicea, "and therefore to accord the better with all countries adjacent that have received that reformation of subtracting ten days only, they think it may be assented unto, without any manifest error". Dee accordingly (but grudgingly) revised his almanac for 1583 to omit ten (rather than eleven) days from the months May to September 1583, "without changing of any feast or holiday moveable or fixed, or without altering of the course of Trinity Term". [11]

The judges also proved favourable to the reform, seeing no problems for the complicated legal calendar, but the Church proved to be a stumbling block. Archbishop Grindal was ordered to consult quickly with his colleagues, but the bishops dragged their feet and had to be chivvied; their eventual reply was destructive. [12] The delay was excused on the grounds that so weighty a matter required "mature and deliberate consultation" both with convocation and with protestant churches abroad, lest "we should offer just occasion of schisme ... by allowing, though not openly yet indirectly, the Pope's dewyse and the [Tridentine] counsayle". The reply was collectively signed by Grindal and bishops Aylmer, Piers and Young, enclosing also "the judgement of some godly learned in the mathematicalls". The main objection was simple: "Seeing that the Bishop of Rome is Antichrist, therefore we may not communicate with him in any thing". It was the duty of the reformed churches actively to distance themselves from the church of Rome. There was also the salient point that the 1571 bull excommunicating and threatening the life of the queen was still current. To conform to a bull on calendar reform issued "under payne of excommunication" would signal fear of the pope "and so confirme the Papists and offend the weak brethren". But if the pope had no authority to reform the calendar, who did? The bishops readily acknowledged Walsingham's statement that it was a "mixed civil and ecclesiastical matter". If it were to be introduced in England, then Convocation would have to be consulted; and since alteration of the Book of Common Prayer was necessary parliament would have to be involved as well. On top of the risk of schism at home, there was a further risk of schism with protestant churches in other countries who would also have to be consulted.

The bishops' objections ranged over other issues too, such as the necessity or otherwise of exact observance of feast days, whether the issue of the calendar was important enough to justify the religious strife it would cause, and the practicalities of reform. The council nonetheless pushed on and drew up a proclamation which sought to counter their objections. [13] The convenience of the reform for trade and diplomacy were emphasised. Although it was recognised that the reform was only to the time of Nicaea and not that of Christ, it was pointed out that the Council of Nicaea was held in the highest regard by the Church of England, not least because it had been presided over by a Christian emperor, Constantine. The proclamation, however, was not published. This may have been meant simply as a tactical retreat, for in the parliament of 1584-5 there was introduced "An Act, giving Her Majesty authority to alter and make a calendar, according to the calendar used in other countries". However, it got no further than the Lords and was lost in the dissolution. [14] The measure accompanied an attack led by Leicester on the powers of the bishops, but in other respects the session was a bad one for such a measure, for it was concerned mainly to safeguard the safety of the queen against the threat posed by another papal bull, the 1571 bull of excommunication. There was not to be another serious attempt to reform the calendar in England until 1699, and no successful one until 1752. England, amongst the protestant countries most favourable to the original Gregorian reform, was to be one of the last to accept it.

It is easy to see why the Gregorian reform was unacceptable to the Church of England. It is more difficult to see why the privy council was so keen to push ahead with it. There is no room for detailed speculation here, but the possible explanations include the obvious attraction of simplifying diplomatic correspondence (particularly with the English troops in the Netherlands, which had adopted the new calendar), and the desire to assert civil authority in this "mixed civil and ecclesiastical area" against the bishops. There may also have been another, unspoken reason. At the same time as the calendar issue was being considered, Burghley's anti-catholic polemic *The Execution of Justice in England* was being published; the first edition appeared on 17 December 1582, and a revised version on 14 January 1583. It was Burghley's counter-attack against those Roman catholic apologists who denounced the execution of priests as a heresy-hunt. Not so, insisted Burghley: the priests were executed for treason, not heresy; it was what they did, not who they were, that brought retribution. He underlined his point with the statement that "Christian kings, for some respects in policy, can endure the Pope to command where no harm nor disadvantage groweth to themselves". [15] What better way, at the height of the controversy, to demonstrate this point than by adopting the Gregorian calendar, duly tested for correctness by English scientists? Burghley's persistence in persuading Dee to recommend in favour of the new calendar acquire new point. A public demonstration that England was prepared to accept some things that came from Rome would have underlined the particular reasons for rejecting the rest. It would have shown that England was a nation closed to treason but open to reason, a nation persecuted rather than a nation of persecutors.

Neither can the bishops' stance be seen in terms of simple anti-papery, as has usually been the case. Their arguments were to a great extent about the nature of religious authority: of the status of general councils, of the church fathers, of convocation, and even of the papacy. These were the not concerns of Bible-thumping puritanism but rather of nascent anglicanism. It will not do to see the English rejection of the Gregorian calendar in 1583 as a straightforward case of anti-popish zealotry prevailing over more moderate councils. The key issue was whether the calendar was seen as a religious or a civil matter. The whole range of opinion on the bishops' bench, from the puritan sympathizer Grindal to the anti-puritan Aylmer, was against the reform. The whole range of opinion on the secular side was for the reform. The dividing line on the issue of calendar reform lay not between England and Rome but within England, between church and state. As long as there was major disagreement over whether the calendar was a religious or a civil or, indeed, a scientific issue, it was unlikely to be reformed. One player in the debate, however, saw the calendar in a different context from everyone else: John Dee. His work merits special consideration.

Dee's treatise on the calendar has had a poor press. Hoskin simply records it as a "favourable verdict" on the Gregorian reform. [16] For North, Dee's astronomy is second-hand and inferior, his treatise "a pale shadow of the Gregorian recommendations", his outlook "excessively insular", his emphasis on the time of Christ rather than the time of Nicaea merely "a very refined form of nationalism", vitiated by willingness "to compromise with Rome" when pressed. [17] Dee's biographers have duly noted the calendar episode but have not followed it up, and this despite the exhaustive attention paid to his mystical obscurities and his marginalia. [18] Understood in context, however, it emerges as the culmination of decades of better-known work on the history and future of the "Brytish empire", and as Dee's last attempt to gain recognition and patronage for his ideas in England before leaving for the continent.

The part of Dee's *Playne discourse* which deals with the astronomical arguments is not the most significant part, and Dee did not pretend to any special expertise in this area. As we have seen, he was content to acknowledge that the Gregorian measure of the year was a good enough approximation upon which to base the vulgar calendar for millenia to come. For Dee, as for the Gregorian reformers, correct observations were an essential tool for calendar reform, but they did not on their own dictate a solution. Dee rejected the Gregorian calendar because it started from the wrong base, from the time of the first general council of the Christian church rather than from the time of Christ. Between the pope's ten-day reform and Dee's eleven-day one lay a great

theological divide. Like the council of Trent, Dee saw calendar reform as part of a much wider agenda. It is this wider vision which is dealt with in the all-important appendix to the *Playne discourse*.^[19]

The appendix contains Dee's case for an Elizabethan protestant reform of the calendar, and finishes with a formal petition to the queen to adopt it. The widest perspective is revealed in the concluding poem, which is worth considering in full.

As Caesar and Sosigenes,
The vulgar kalendar did make,
So Caesar's Pere, our true Empress,
To Dee this work she did betake.

To finde the Dayes superfluous,
(which Caesar's false Hypothesis,
Had bred; to Nature, odious:)
Wherein, he found eleven amyss.

For he, from Christ, Chief Root of time
The time did try, by heavenly wit:
No Councell dan deme this a crime
From CHRIST, to us, tear time to fit.

ELIZABETH our Empress bright,
Who in the yere of eighty three,
Thus made the truth to come to light,
And civile yere with heaven agree.

But eighty foure, the Pattern is
Of Christ's birth yere: and so for ay
Eche Bissex't shall fall little mys,
To shew the sun of Christ birth day.

Three hundred yeres, shall not remove
The sun, one day, from this new match:
Nature, no more shall us reprove
Her golden tyme, so yll to watch.

The God of might, our father dere,
Whose rayng no tyme can comprehend,
Good time our Elizabeth grant here
And Bliss aeternall, at her ende.

Amen.

The theme of the poem is that of restoring earthly affairs to an original harmony. This happens in several different ways; there are, in all, seven restorations proposed in Dee's short poem, and it will be useful to treat them one by one.

Dee's first restoration is that of the calendar to its position at the time of Christ. He writes here of "Christ, chief root of time", and elsewhere in the treatise of Christ's birth as "the 'Radix of Time'". The reference to "the sun of Christ birth day" indicates that Dee regarded this as of astrological significance. Dee had gone so far in his as to calculate that Christ was born in a leap year ("bissex't"), and one suspects that he had been indulging in the illegal practice of casting the horoscope of the son of God. Dee saw religious truth and arcane science as aspects of the same revelation, and it was essential to maintain a common framework for both; the calendar was part of this framework.

Secondly, restoring the calendar to its position at the time of Christ had close parallels with the protestant mission to return christianity to its roots. Dee says relatively little about this, for he was concerned with the general principle of primitive simplicity rather than with the detailed debates about the character of the early church which preoccupied ecclesiastical writers. Nonetheless, his aim is made clear enough in the lines: "No Councell can deme this a crime/From CHRIST, to us, tear time to fit". Elsewhere in the polemical appendix, he declares in favour of "The incomparable excellence of the TRINITIE COUNCEL above Nicene Council". The christian calendar was to go back to basics.

Dee's third restoration was of the unity of Christendom. Dee's anti-popery was limited and conditional. The pope had not created the faulty Julian calendar, and his attempt to reform it had been genuine but misguided. Dee believed that once the reformed English calendar had, by virtue of its inherent superiority, been widely adopted, in the end even the pope would have to "embrace the veritie". In this sense, Dee shared the Gregorian (even Tridentine) vision of a basic level of Christian unity being achieved on the basis of a common calendar, based on rational agreement. This in turn was linked to Dee's vision (discussed below) of a new "Brytish empire" spreading "with the intention of setting forth the glory of Christ" throughout the northern hemisphere. ^[20] More widely, French has argued that Dee believed protestant/catholic unity was possible, but that it would happen on the basis of a higher philosophical unity. Mathematics was one of the elements of this higher unity, for it was a way of achieving links with God through numbers. ^[21] The Copernican system was one expression of this higher unity; the truly reformed calendar was another. Dee's own religious ideas were centred around the ambition to achieve a unity of religious and philosophical knowledge in a single scheme of creation. Included within this scheme was, French has argued, an ambition to reunite the catholic and protestant faiths. What better first step for all of this than to revive the Nicean project for a common calendar, on the basis of mutually accepted astronomical reasoning?

This leads us to Dee's fourth restoration: that of the correspondence of the civil and natural years, and by extension of the earthly order to that of the heavens. The theme is clear enough in the poem. The Julian error is "to Nature, odious". When it is corrected, "Nature, no more shall us reprove/Her golden tyme, so yll to watch". This theme of harmony between the civil and natural orders suffuses Dee's work. In *The Mathematical Preface* (1570), Dee had divided creation into the terrestrial world, which consisted of things physical, and the heavenly world, which consisted of things transcendent; number and mathematics occupied an intermediate place, being at once both definite and intangible. Numbering thus held the key to creation. ^[22] Dee quoted the nineteenth psalm: "The Heauens declare the glory of God, and the Firmament sheweth forth the workes of his handes". He went on:

Astronomie, was to us, from the beginning, commended, and in maner commaunded by God him selfe. In asmuch as he made the Sonne, Mone,

and Sterres, to be to us, for Signes, and knowledge of Seasons, and for Distinctions of Dayes, and yeares ... without great diligence of Observation, examination and Calculation, their periods and courses (whereby Distinctions of Seasons, yeares, and New Mones might precisely be knowne) could not exactly be certified. Which thing to performe, is that Art, which we have Defined to be Astronomie. Wherby, we may haue the distinct Course of Times, dayes, yeares, and Ages: aswell for Consideration of Sacred Prophetes, accomplished in due time, foretold: as for high Mystically Solemnities holding: And for all other humane affaires, Conditions, and couenantes, upon certaine time, betwene man and man: with many other great uses. Wherin, (verely), would be great uncertainty. [23]

The reference is to Genesis 1.14: "And God said, Let there be lights in the firmament of the heaven to divide the day from the night; and let them be for signs, and for seasons, and for days, and years". The stress on "signes" betokened Dee's commitment to astrology, another discipline requiring an accurate calendar. The whole *Mathematicall Praeface*, indeed, was a manifesto for the practical value of mathematics in all areas of life: mechanics, manufacture, music, navigation, and much else. The aim was to achieve "Natural and heavenly Concordances". [24] Correct numbering and measurement, in short, were the way for humanity to achieve not only correct knowledge of the divine order but also the right management and exploitation of the world in accordance with divine wishes. In an unpublished work of 1570, *Brytannicae Republicae Synopsis*, Dee had written of the duty of human intelligence to discover and reconcile earthly and heavenly wisdom. Laws, for example, "ought to be ordred to gither in a Body Methodicall: and not to be a Confused Chaos (and Worse) as they are", while a soundly based currency was essential to prosperity. [25] The calendar was a perfect instance of a mathematically correct framework as the key to harmony between the earth and the heavens, between the human and natural worlds. The reference in the title of the *Playne Discourse* to "accompting, or verifyeng" posits an identity between numbering and truth. The force thus becomes apparent of Dee's claim that his calendar reform "Thus made the truth to come to light,/And civile yere with heaven agree".

The reformed calendar would have played a significant part in what Seymour has called "a British duty to bring order to a savage world". [26] Here lies Dee's fifth restoration: of Britain to her historic imperial role, under (as the verse has it) "Elizabeth, our Empress bright". All Christendom, Dee believed, would follow "Queen Elizabeth's perpetual calendar", to the advantage of international trade. This would be a matter of more than mere harmony, however. Dee had carefully adjusted his calculations of Christ's birth from the meridian of Bethlehem to that of London, so that "a marvelous Concordance (to our great Confort) may hereafter appear of the like places of the Sun orderly at the London Meridian". [27] This was not merely a protestant or an Elizabethan calendar; it was an imperial calendar. For the full significance of this aspect of Dee's treatise, which is present as an overarching assumption, we need to look at Dee's historical writings in the preceding years.

Dee has been credited with the popularisation, and one of the earliest uses, of the term "British empire". This was well before the union of the crowns of England and Scotland gave the term "British" its modern use; Dee's Britain was the ancient Britain of Arthur, straddling England and Wales. Dee had close contacts with the leading antiquaries of his day. He followed Polydore Vergil in seeing Britain's founding in the landing of Brutus after the Trojan wars. Arthur was the restorer of this ancient empire of Britain, and this empire had in turn devolved by descent upon Elizabeth. Dee and the Tudors shared Welsh origins, and were distantly related to each other and to Arthur; Dee, appropriately enough, believed himself to be related to the thirteenth-century friar Roger Bacon, whom he dubbed "David Dee of Radik", and who had long ago called upon the pope of the day to reform the calendar and whose views on the divine significance of numbering would have been familiar to Dee.

In 1576 Dee had published a four-volume work under the general title of *The Brytish Monarchie*, in which he elaborated his imperial case. [28] The well-known frontispiece to the volume on *The Art of Navigation* (1577) carried an image of the "Imperiall Ship" of Christendom, carrying the Empress Elizabeth on a mission to restore her empire through sea power. The same work carried extensive hydrographical tables, entitled "The Brytish Queene Elizabeth, Her Tables Gubernautik", an idea prefiguring "Queen Elizabeth's perpetual calendar". Historical recovery, geographical expansion and mathematical advance went hand in hand. He followed this four-volume work by drawing up for the queen her "Titles to far lands", two manuscript rolls setting out her descent and title to the empires of Brutus and Arthur.

Dee at this period was personally involved in a number of schemes for exploration and recovery, supplying both navigational advice and an ideological rationale. [29] He aided Gilbert's plans to colonise north America and (Dee hoped) evangelize the natives; Gilbert, indeed, had ceded to him for his trouble all land beyond 55 degrees north (roughly speaking, Canada). He had advised, too, on Drake's circumnavigation; indeed, Drake's return with news of "New Albion" may have inspired his *Titles to Far Lands*. At the same time as he was working on his calendar treatise, Dee was advising Adrian Gilbert on further explorations. Indeed, when Walsingham dropped by on 23 January 1583 to (we may surmise) retrieve his copy of the papal bull reforming the calendar, he found Dee and Adrian Gilbert mulling over plans for a north-west passage, and joined in with the discussion, which was continued over the following days and weeks. [30]

Dee, in summary, foresaw "an Incomparable Ilandish monarchy" over "all the northern Ilands" (in practice, virtually the entire hemisphere): in a phrase pregnant with meaning, "a Cosmographical Reformation". [31] "Cosmographie", the mapping of the world, had featured in Dee's *Mathematicall Praeface* as an art which "matcheth Heauen, and the Earth, in one frame, and aptly applieth parts Correspondent: So, as the Heauenly Globe, may (in practise) be duely described upon the Geographicall, and Hydrographicall Globe". [32] As Sherman puts it, "no-one went so far as Dee in combining geometrical symmetry, divine will, and the royal person to justify England's nascent maritime empire". [33] The keystone of this whole enterprise was Dee's a new and correct Elizabethan calendar, anchored on the London meridian. It was his faith in the British empire as much as his faith in the protestant religion which led him to believe that the Elizabethan calendar would in time be adopted everywhere.

Dee's sixth restoration was that of control of the calendar, out of the hands of the bishop of Rome and into those of a christian empress, successor and imitator of Constantine. The Julian calendar was "Caesar's false hypothesis", to be corrected by "Caesar's Pere, our true Empress" Elizabeth. The message was obvious to a careful reader: Caesar, a secular dictator, had instituted a false calendar; pope Gregory, a religious dictator, had reformed it badly; Elizabeth, a just Christian prince, would restore the true calendar, balancing earthly and heavenly imperatives in her policy as she harmonized civil and religious authority in her person. Their respective methods of calendar reform carried a similar message: Caesar had imposed his calendar by means of an "annus confusionis" of 446 days; the pope had introduced his with a similarly dictatorial and disruptive removal of ten days all at once; Elizabeth's calendar reform was to be introduced gradually and gently in a true "annus reformationis", by shortening the months from May to September in a way which would hardly be felt. And whereas Caesar and Gregory had proceeded by dictat, she would proceed constitutionally, grounding the reform in the royal prerogative, and appealing on grounds of truth alone to other princes to follow suit.

There are links to be made here with Dee's wider concerns, which have been traced by Frances Yates. Foxe and Jewel had proclaimed an English protestant tradition in which Elizabeth was seen as the successor of Constantine. In bishop Jewel's *Apology of the Church of England* (1564), one of the foundation texts of the anglican church, "Christian kings and good princes" are seen as the true heirs of the Roman empire, whose functions had been usurped by "the tyranny of the Bishops of Rome" and the recent council of Trent. [34] Jewel's examples of "Christian princes and good kings" were Moses, David and Constantine, all leaders with dual civil and religious qualifications. Constantine was a particularly happy model for protestants: as the first Christian emperor of Rome, proclaimed as such in York, and half-English to boot, he had summoned and presided over the council of Nicea, at which British bishops had been in attendance to see the official christian calendar formally instituted. In Foxe's *Book of Martyrs* (1563), a copy of which was placed in all parish churches alongside the Bible, an illuminated letter "C" at the start of the word "Constantine" contains an image of Elizabeth enthroned, trampling the papal crown,

having returned to her imperial inheritance. The same icon appears, at the start of a different word, in Dee's *Art of Navigation* (1577). Part of it is reworked to provide a picture of Elizabeth and her advisors aboard "the Imperiall ship" Europa in Dee's carefully-worked allegorical frontispiece to the same work, guided on her Christian mission by the sun, moon and stars in the heavens [35] Once again, the unity of Dee's vision is striking. With the return of the calendar to its root at the birth of Christ, under the aegis of Constantine's rightful successor Elizabeth, truth and authority would be fully restored. The royal authority to reform the calendar was the same as that for the English reformation.

Dee's seventh and final restoration was more personal: that of himself to his rightful place as imperial magus. In the first verse of his poem, he explicitly compared his role to that of Caesar's astronomer, Sosigenes, creator of the Julian calendar:

As Caesar and Sosigenes,
The vulgar kalendar did make,
So Caesar's Pere, our true Empress,
To Dee this work she did betake.

Dee had big ideas about himself. As he later claimed, somewhat bitterly, "I might have served five Christian emperors". [36] In the 1577 preface to *The art of navigation*, writing of himself in the third person, Dee lamented that "yf. . . he had found a constant and assistant CHRISTIAN ALEXANDER, BRYTAN should not haue bin now destitute of a CHRISTIAN ARISTOTLE". He referred pointedly to "this BRYTISH MONARCHIE" and to himself as 'this BRYTISH PHILOSOPHER'. [37] It may (Seymour suggests) have been Dee whom Bacon had in mind in 1589 when he had a character in a play announce: "I will strengthen England with my skill". [38] Elizabeth had in fact been "Dee's most consistent patron", and she had visited his house on a number of occasions, invited him to court to present his scrolls of her titles to foreign lands, and generally flattered and offered judicious flattery and encouragement. Dee had for long neglected to preface his works with fulsome dedications, and may (as Clulee suggests) have come to see this as one reason for his failure to secure adequate patronage, but he remedied this in 1583. The treatise on the calendar which he produced was much more than the simple advice for which he had been asked. It was carefully inscribed and bore an illuminated device. While it began with a decent enough dedication to Burghley, it ended with a poem and a formal petition to the queen to proclaim "Queen Elizabeth's perpetual calendar" to the world. It marked the apex of his courtly ambitions, the moment when Dee saw his last and best chance to link his name in calendrical perpetuity with that of the successor of Caesar and Constantine, and to become the philosopher-general of the Christian world.

Dee's attempt to gain patronage through the calendar treatise, however, backfired. Six years before, in 1576, the queen had at last agreed to allow Dee the secure income he had sought for so long: the lord chancellor informed the archbishop of Canterbury that the queen wanted Dee to have the livings of two rectories, worth around £1,000 a year. It was 1582 before Grindal got round to granting them. Dee explained the fate of this belated transaction in his autobiography. When I should have followed the getting out of the greate seal unto it, I was wholly employed (at her Majestie's and the right honourable the Privy Counsellours, their commandment) about the Reformation of the Kalender. Which office anciently did appertaine to the bishops. . . as also I had small thanks at their handes anyway, nay, great hindrance ... [39]

Dee, in short, was so busy on his *Playne discourse* that he forgot to get the grant sealed, and lost it. Financial injury had been added to the insult of rejection of his proposals. It is not surprising that he soon gave up hope of achieving due patronage and recognition in England. Dee had been conversing with angels since November 1581. When in May 1583, a month after the calendar debacle, count Laski arrived to take an interest in these occult activities, Dee must have been receptive to his attentions; in September he left for Poland with Laski, with the promise of better rewards than he had gained at home.

We may speculate on Dee's chances of success with his original proposal. Would the bishops have rejected Dee's eleven-day reform, with its cleverly-conceived opportunity for asserting the authority of the Church of England against that of the Church of Rome? One suspects not, or at least that their reply would have been equivocal enough to allow Burghley room for manoeuvre, as he had manoeuvred around Dee's particular objections. There is also evidence that Dee's support for calendar reform of some sort was shared by others, and that the idea of a reform distinct from the Gregorian reform had wide appeal. We have seen that the scientists Digges, Savile and Chambers thought Dee's scheme "the better reformation". William Harrison's *Description of England*, written as part of Holinshed's *Chronicles* in 1577 and published ten years later, identified calendar reform as a problem to be addressed, and whilst amenable to the Gregorian version envisaged a calendar reform with a specifically English name and rationale. [40] A similar position was taken up by one W. Farmer, a Dublin surgeon, who published an almanac for England and Ireland for 1587. The almanac carried dual Julian and Gregorian calendars, and while noting the convenience of harmony with the continent expressed reservation over the Gregorian reform and urged that the issue be referred "to the judgement of the reverent Divines, and learned Astronomers. . . The one, in respect of Conscience, the other in respect of the communitie of Computation". [41] Finally, an almanac of 1591, by one "J.D.", provided a triple calendar of old style, new style and "true style" dates, the last corrected by thirteen days rather than ten to bring Christmas day back to its rightful place on the shortest day, December 21st. The author explained that he had written it as a result of an argument amongst a company of "worshipfull" and "learned" men about the best means to reform the calendar. [42]

We may conclude that there was considerable potential support for calendar reform in England in the period surrounding the Gregorian reform; that the idea of an independent, English calendar reform, perhaps different in content as well as rationale from the Gregorian reform, also had considerable support. Dee's simultaneously pro- reform and anti-papal outlook commanded considerable respect throughout the seventeenth century; indeed, at the time of the adoption of the Gregorian reform in England in 1750 the *Biographia Britannica* described Dee's treatise as "one of his best performances", which had stood the test of time. [43] In more favourable circumstances, Dee's proposal would have stood a significant chance of success.

Those better circumstances came with the defeat of the Armada. Dee's British imperial outlook was close to that of the mainstream of English protestant culture, and the gap closed further in 1588. In that year an engraving "Sphaera Civitatis" was published, mixing political and astronomical symbolism in a way that Dee would have recognised. "Elizabeth, by the grace of God queen of England, France and Ireland, defender of the faith" embraces a "civic sphere" on the Copernican model, each of the inner spheres occupied by one of seven civic virtues with "justitia immobilis" at the centre. [44] Both the "Armada portrait" and the "Ditchley portrait" of Elizabeth include maps and other of the symbolic paraphernalia of empire and expansion. Here was a moment of optimism which might have provided more fertile ground for an English calendar reform. Dee shared in this optimism, for he had also had a hand in the defeat of the Spanish armada. The story is recounted by Seymour. In 1587-8, Dee was spreading prophecies from his base in Prague about "the imminent fall of a mighty kingdom amid fearsome storms". These reached the Vatican via the emperor Rudolph, Dee's patron, but more importantly they also reached the Dutch almanac printers, who at this stage supplied much of the continent with almanacs. Reprinted thus, Dee's prophecies "significantly undermined the morale of the Spanish at a critical moment". [45] . Dee was understandably exultant at the news of the defeat of the Armada, and his letter to the queen is currently on display in the British museum manuscript galleries. Dee rejoices in the arrival of "your Brytish Earthly Paradise". The letter comes from Bohemia, home of the kalenderstreit, and, is dated not "new style" or "old style" but "stylo vere". [46] Dee's new age had arrived at last, and Dee's Elizabethan calendar was brought out again to welcome it.

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Notes

1. The start of the year was taken to be 1 January; the medieval custom of reckoning by the year of grace, beginning on 25 March, had been discontinued in most continental countries by this time, although it continued in England for government purposes until 1752. The best source on all this is: G. V. Coyne et. al. (eds), *Gregorian reform of the calendar: proceedings of the Vatican conference to commemorate its 400th anniversary, 1582-1982* (Vatican City, 1983). On the longer history of calendar reform in England, see R. Poole, "Give us our eleven days! Calendar reform in eighteenth-century England", *Past & Present* 149 (Nov. 1995), pp. 95-139.
2. *Calendar of State Papers (Foreign) Eliz. I*, xvi, pp. 396, 434, 455, 505, 507, 517, 521-2, & preface; *CSP (Venetian) Eliz. I*, viii, p. 41.
3. The principal works on Dee used in this study are: P. French, *John Dee: the world of an Elizabethan magus* (1972), esp. chs 7-8; N. H. Clulee, *John Dee's natural philosophy* (1988), esp. pp. 180-96; F. A. Yates, *Astraea: the imperial theme in the sixteenth century* (1975), esp. pp. 38-51; W. H. Sherman, *John Dee: the politics of history in the English renaissance* (Massachusetts, 1995), esp. chs 5 & 7; and I. Seymour, "The political magic of John Dee", *History Today*, Jan. 1989, pp. 29-35. Clulee's work has been especially useful, and includes a thorough bibliography of the various ms. versions of Dee's writings on the calendar, which are not cited in detail in this article.
4. Bodleian Library, MS Ashmole 1789 fos. 1-62. Individual page references for this document will not normally be given here.
5. M. Caspar, *Kepler*, 2nd edn (New York, 1993), pp. 230-1.
6. In his diary on December 25th, Dee had already decided that the correction of the calendar was "a civile equation, but mathematically and religiously to be substantiated". J. O. Halliwell (ed), *The Private diary of John Dee*, Camden Society xix (1842), p. 18.
7. What this matter was is not known, but the November deadline also appeared in Dee's treatise. I welcome suggestions. It may have had some astrological significance, perhaps in relation to the great conjunction of Jupiter and Saturn on 28 April, which, since previous such conjunctions had coincided with the periods of Christ and Charlemagne, was widely expected to bring great changes to empires and natural disasters: M. Aston, "The fiery trigon conjunction", *Isis* 61 (1970), pp. 158-87.
8. Christopher Hill, *Intellectual origins of the English Revolution* (1974), pp. 19-20; E. G. R. Taylor, *Mathematical practitioners of Tudor and Stuart England* (Cambridge, 1967), p. 175; J. O. Halliwell (ed.), *Letters on scientific subjects* (1842, repr. London, 1965), p. 6.
9. R. S. Westman, "The astronomer's role in the sixteenth century: preliminary study", *History of Science* xviii, 1980, pp. 129-30.
10. John Chambers, *Astronomiae encomium* (1601); *A treatise against judicial astrologie* (1601).
11. Dee's original almanac with eleven days omitted is in Corpus Christi College, Oxford (henceforth CCC), MS. 254 fos. 162-9, and his revised ten-day version follows on fos. 170-6.
12. The bishops' reply, together with some of the other documents used in this paper, are collected in *Gentleman's Magazine* xxxvi (1851), pp. 451-9. The originals are in the British Library, Add. MS. 32,092, with a copy in Add. MS. 14,291.
13. *CSP (Dom.) Eliz. I*, clx, art. 28
14. P. Collinson, *The Elizabethan puritan movement* (Cambridge, 1967), p. 270; House of Lords Journals ii, pp. 99 & 102.
15. C. Read, *Lord Burghley and Queen Elizabeth* (London, 1960), p. 252. *The execution of justice in England* is reprinted in Harleian miscellany, ii (1744).
16. M.A. Hoskin, "The reception of the calendar", in Coyne, *Gregorian reform of the calendar* p. 256.
17. J. D. North, "The western calendar: four centuries of discontent", *ibid.*, pp. 102-4. North's essay is more accessibly reprinted in his *The Universal Frame* (1989).
18. J. L. Heilbron, "Introduction" to *John Dee on astronomy*, ed. W. Shumaker (Berkeley, 1978), p. 15; Clulee, *John Dee's natural philosophy*, pp. 177-8, 288 n.6, & bibliography; Sherman, *John Dee*, pp. 117-18. Sherman's thoroughness on the latter point extends to the deduction (p. 169) that the author of one of the marginalia in an edition of Dee's *British monarchy* was clearly "someone with experience. . . of the business of salting herrings".
19. Dee, *Playne discourse*, pp. 42-62.
20. Sherman, *John Dee*, pp. 180-5. The phrase is from a 1578 manuscript of Dee's.
21. French, *John Dee*, pp. 97-103, 105, 119. Dee's treatise on the vulgar calendar did not, of course, depend upon Copernican assumptions, but did use Copernican observations.
22. J. Dee, *The Mathematicall Praeface* (London, 1570; repr. New York, 1975), pp. 14-15; Clulee, *John Dee's Natural Philosophy*, ch. 6.
23. *Ibid.*, sig. biir-v.
24. The phrase is taken from a marginal note on pp. 45-7 of Dee's *Playne Discourse*.
25. Sherman, *John Dee*, pp. 134-6, 142.
26. Seymour, "Political magic", p. 35.
27. Dee, *Playne Discourse*, pp. 32-40, 45-7.
28. This section is based mainly upon: French, *John Dee*, ch. 8; Clulee, *John Dee's natural philosophy*, pp. 180-9; E. G. R. Taylor, *Tudor geography 1485-1583* (1930), pp. 134-7; Yates, *Astraea*, pp. 38-51; Sherman, *John Dee*, ch. 7; and Dee's own *Compendious Rehearsal* (esp. pp. 60-6) and *Discourse Apologeticall*, both in J. H. Crossley (ed.), *Autobiographical Tracts of John Dee* (Manchester, 1851).
29. Clulee, *John Dee* p. 188
30. Taylor, *Tudor Geography*, pp. 137-8; Sherman, *John Dee* pp. 118 & 173-4; CCC MS. 254 fol. 182r; Walsingham to Dee 25 Mar. 1583.
31. Sherman, *John Dee*, pp. 150-1.
32. Dee, *Mathematicall Praeface*, sig. biir.

33. Sherman, *John Dee*, p. 192.
34. J. Jewel, *An apology of the Church of England*(1564), ed. J. E. Booty (New York, 1963), p. 113 & partvi.
35. Yates, *Astraea*, plates 4a, 7a & 7b.
36. Dee, *Compendious rehearsal*, pp. 8-9.
37. Dee, *A necessary advertisement*, in Crossley, *Autobiographical Tracts*, pp. 50-67.
38. Seymour, "Political magic", p. 30.
39. Dee, *Compendious rehearsall*, pp. 13-14. The point has been made before, by Clulee: John Dee, p. 196.
40. W. Harrison, *The description of England* , ed. Georges Edelen (1587; Washington and New York, 1994), pp. 388-91.
41. W. Farmer, *The common almanacke or kalendar. . . 1587* (London).
42. "J. D.", *A triple almanack for the yeare of our Lord God 1591* (London, 1590). The almanac has been attributed to John Dee, and Clulee (p. 229) supports this attribution, but the passage quoted above does not sound like Dee, and the "true" calendar is not Dee's original true calendar; the British Library attributes it to one J.Dade.
43. *Biographia Britannica* iii (London, 1750), pp. 1637-8.
44. Yates, *Astraea*, plate 9c; also reproduced in Seymour, "Political Magic", p. 33.
45. Seymour, "Political magic", p. 34.
46. BL Harley MS. 6986 fol. 45, Dee to Elizabeth, "the 10th Novembre: A. Dm-: 1588 stylo vere". The item is currently on display in the permanent display of books and manuscripts on the ground floor of the British Museum.

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