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John Twysden and John Palmer

Two Northamptonshire Astronomers By Mike Frost



Fig 1: Right. Published in 1658, John Palmer edited an edition of John Blagrave's "Mathematical Jewel"
 Fig 2: Below. The church at Ecton, Northamptonshire, on 18th November 1641

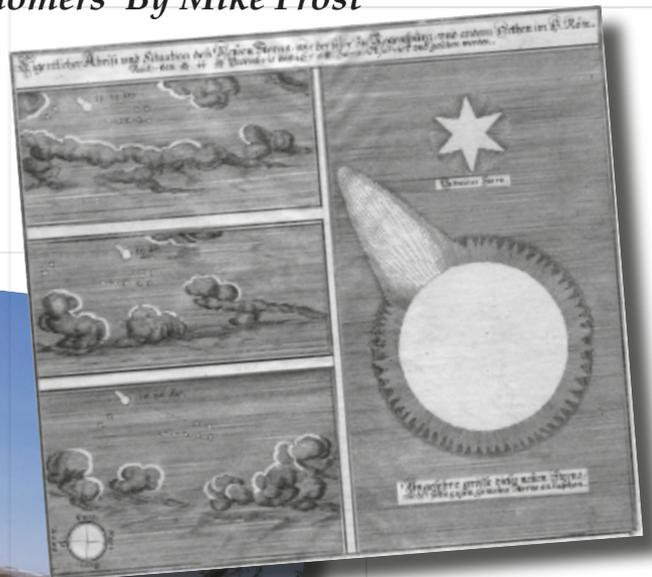


Fig 3: Above. The comet of 1653, seen during December by John Twysden



More dead astronomers. Sorry ...

You will recall that in recent editions of MIRA I have written a great deal about a group of astronomers active in the Coventry area during the middle of the seventeenth century. Most particularly, Samuel Foster, who may have been born in Coventry and certainly taught there at King Henry VIII school during the 1630s. Foster (c.1600-1652) was Gresham Professor of Astronomy in London in 1636 and again between 1641 and his death in 1652. He was an authority on (sun) dialling and master of the spherical trigonometry needed to design intricate and ingenious dials.

From my point of view, the most interesting thing about Foster was his connections to Jeremiah Horrocks, first man to predict and then observe a transit of Venus, in 1639. Foster, like Horrocks, had been a student at Emmanuel College in Cambridge. The two corresponded and Horrocks attempted to warn Foster about the upcoming transit in 1639, although there is no evidence that Foster received the advance warning. You may recall however, that another Coventry astronomer, the mysterious Nathaniel Nye, did make a claim, in a 1642 almanac, to have seen the 1639 transit, although his details were garbled (and so I think he was trying to pass off Horrocks's observations as his own).

Foster's most lasting astronomical legacy was his catalogue of "*Observationes Eclipsium*" (observations of eclipses) published after his death by his friend and fellow observer John Twysden. The first of these eclipses, a lunar eclipse, is the most interesting from

a Coventry point of view, as Foster observed it, along with his fellow astronomers John Twysden and John Palmer, from New House Coventry, in December 1638. New House, which was owned by Christopher Yelverton, stood in the area which is now Keresley; it was demolished over two centuries ago, but the estate which now stands in its place contains a Foster Rd and a Yelverton Rd (and a pub called the Yelverton Arms).

In December 2006 I published a paper on Foster, refereed by Allan Chapman, in "*The Antiquarian Astronomer*", the journal of the Society for the History of Astronomy. The paper (which I also turned into an article in Mira, and a lecture which I have given to several local societies) was well-received. As part of the paper, I intended to give brief biographies of Foster's fellow observers John Twysden and John Palmer. However, as I started to research these two figures, I realised that they were both important figures in their own right. Like Foster and Horrocks (and laterally me) they had connections to Emmanuel, which I found to my surprise was a strong candidate for the birthplace of the scientific revolution in England. Like Foster and Horrocks, Twysden and Palmer knew many interesting characters from English and indeed early American history. And unexpectedly, one of them turned out to have carried out some of the earliest research into the wonderful star that lends its name to the esteemed journal of this society.

So, may I present to you:

John Twysden and John Palmer : Two Northamptonshire Astronomers

By Mike Frost

John Twysden and his siblings

John Twysden was born at Roydon Hall in East Peckham, Kent, on May 1st 1607, the fourth son of Sir William and Lady Anne Twysden.

Many of John Twysden's siblings are characters of historical interest. The eldest son, Sir Roger Twysden (born 1597), was the author of "*Certain considerations on the Government of England*" (c.1655) and "*An Historical Vindication of the Church of England*" (1657), and was described by his biographer, Frank W. Jessup, as "England's first constitutional historian". Elizabeth, the eldest daughter (born 1600) married Sir Hugh Cholmley, who defended Scarborough Castle during the civil war. Sir Thomas Twisden (born 1602), the second son, is known with a different spelling of the family name, and began a branch of the family

based at Bradbourne House, at East Malling, just to the north of Roydon. Thomas Twisden's brother-in-law, Colonel Matthew Thomlinson, attended King Charles I the night before his execution and was present at the scaffold: Charles's golden toothpick was a Twisden family heirloom for many years. There was a younger daughter, Anne (1603) who in 1630 married Sir Christopher Yelverton, of whom more below, and two other younger sons, William (born 1605) and Francis (1609) who had undistinguished careers.

Bradbourne House remained with Thomas Twisden's descendants, albeit with increasingly straitened circumstances, until 1937, when the line died out on the death of John Ramskill Twisden. Fortunately the majority of the family portraits were



Fig 4: Portrait of Sir Roger Twysden



Fig 5: Portrait of Sir Thomas Twysden

kept together, under the ownership of the Kent Historical Society, and reunited with other portraits in the care of the National Portrait Gallery. The building and grounds of Bradbourne House are now owned by the East Malling Trust for Horticultural Research; much of the house is given over to offices although the larger rooms are hired out for weddings and conferences. I am grateful to Adrian Padfield, chief executive of the East Malling Trust for Horticultural Research, who gave me a tour of Bradbourne House. The Great Hall of Bradbourne House is now home to 69 family portraits. These include portraits of John Twysden, (on cover, left.), Sir Roger Twysden and Sir Thomas Twysden, (Figs 4 & 5 above). The portrait of John Twysden is described as *“Portrait, in black coat with plain white falling collar tied by white string with tassels. Circa 1650 (30”x251/4”)*. Artist: *unknown*”. Another possible portrait of John Twysden hangs on the main staircase.

Although, unlike Samuel Foster and John Palmer, John Twysden did not attend Emmanuel College, his two oldest brothers, Roger and Thomas, both matriculated to Emmanuel on November 9th 1614, although Thomas was only 12 years old at the time. They would certainly have known Walter Foster (matriculated April 1614) and probably Samuel Foster (matriculated 1616). The names of Roger and Thomas appear on the college register on the page opposite Walter Foster’s.

Neither Roger nor Thomas completed a Cambridge degree. Throughout his life Sir Roger Twysden had an enormous respect for tradition and precedent, so the radical protestant climate in

Emmanuel College may not have been to his liking. Instead of attending Emmanuel like his elder brothers, John Twysden went instead to University College Oxford. From there, like his elder brother Roger, John Twysden went to the Inner Temple, becoming a barrister-at-law in 1634, although it is not clear that he ever practiced law.

The younger Twysden brothers, William, John and Francis, all travelled to the continent during the 1630’s, perhaps financed by small bequests from their father, who died in 1629. (Sir Roger’s excellent knowledge of French and Italian suggest he may have made similar journeys at some time). John Twysden went to France in 1634 in the company of Sir George Stone and possibly Hugh Cholmley.

John Twysden studied medicine in Angers. A century later Roger Newdigate, a descendant of Thomas Twysden, visited Angers on his own grand tour, and wrote *“We took a walk into the Manege yesterday. I saw Mr Bromley’s and Sir Thomas Twysden arms up there which is the custom when people go away”*. There is no evidence that Thomas Twysden ever visited Angers but presumably his brother John used similar arms. You might remember Roger Newdigate from my article *“A Warwickshire Eclipse”* in Mira. It came as a great surprise when I found he was related to John Twysden.

John Twysden had returned to England by 1638. He was present at the death-bed of his mother, Lady Anne Twysden, when she died on 14th October of that year. At her last communion, on October 3rd, Anne beseeched the three sons present, Roger, William and “Jack” *“to love the Lord Jesus and to love one another”*.

I have already recorded the observations made by Samuel Foster, John Twysden and John Palmer for the lunar eclipse of 9th December 1638. These were made from New House, Coventry, which was owned by Sir Christopher Yelverton. Twysden also tells us that he joined Samuel Foster in London, to view "*The Eclipse of the Sunne which happened May 22 P.M. 1639, observed in Old Bayly at London.*"

By the winter of 1645/6, however, John Twysden was in Rouen; he also writes (in 1685) about being in Paris around 1645. I do not know what caused him to return to France. One possibility was to continue the studies which he started in Angers; another was the deteriorating political situation in England. Sir Roger Twysden, John's older brother, became involved in a petition from the people of Kent to parliament, which led to his imprisonment and a series of interminable lawsuits and further petitions to parliament. As the Civil War deepened, Sir Roger, who had failed in an attempt to flee the country himself, sent his infant son William to stay with his uncle in Rouen. Separately Sir Hugh Cholmley, who had held Scarborough Castle for the King, was forced out of the country on its fall, and went to stay with his brother-in-law John Twysden.

John Twysden was back in England by the spring of 1648. He spent at least two years at Roydon Hall, the family seat in Kent. Another long-term resident of Roydon Hall was a mysterious figure called Johannes Hind, originally of Mecklenburg, Germany. Hind was a man of learning, famous for his red powder, which was "very effectual in diseases of the spleen, coughs, asthmas, worms, purulency of the chest, the plague, all manner of fevers, smallpox, measles and catarrhs". Twysden, professor of medic, was anxious to know how to prepare the powder, but Hind would not tell him. Twysden, noting that Hind asked for any vipers found on the estate to be delivered to him, carried out experiments and eventually discovered the secret of the powder. Roger Twysden's biographer, Frank Jessup, states that Twysden did not himself reveal the secret of his "viper powder"; however, I found a manuscript in the Centre for Kentish Studies [Ref U49 Z.3.2] which appears to give the recipe. Chapter 2 memorably begins "Take a viper, cut off his head and his tail..."

Twysden left Roydon Hall on April 26th 1651, perhaps in some fear for his safety or freedom. Two days earlier troops had come to the hall to re-arrest Sir Roger Twysden and search for arms and letters. Twysden moved in with his sister Anne and her husband Sir Christopher Yelverton at Easton Maudit, and observations from there (see below) place him in Northamptonshire on July 2nd 1651, March 14th and 29th 1652, and during December of the same year.

Samuel Foster died in 1652. Twysden described him as "*A learned, industrious and most skilful mathematician*". John Twysden became the editor of Foster's Papers (Foster, because of illness, had

published very little during his tenure as professor of astronomy at Gresham College from 1641-52). All Foster's works were published by William Leybourne of London, and it would appear that Twysden was now based in London. Eva Taylor's brief biography of Twysden in "*The Mathematical Practitioners of Tudor and Stuart England*" asserts that Twysden was "...one of those who foregathered at Elias Allen's shop in the Strand where he sometimes met William Oughtred."

Two, possibly three, of Twysden's original publications had an astronomical theme. In 1659 he published "*The Whole Art of Reflex Dialling - Shewing the way to draw all manner of Dials which shall show the hour by a spot of light from a Glasse upon Ceiling, or other Object whatsoever, without any respect had to the Axis of the World, either projected or reflected*". This was Twysden's own contribution to the theory of dialling, featuring "*an easie Instrument fitted with lines to that purpose*", a rather cumbersome piece of apparatus.

In 1667, William Tompson, bookseller of Harborough, Leicestershire, published "*The Semi-Circle in a Sector: The description of a general and portable instrument, whereby most problems (reducible to instrumental practice) in Astronomy, Trigonometry, Arithmetic, Geometry, Geography, Topography, Navigation, Dyalling &c are speedily and exactly resolved*". The author is listed as "J.T.", which the British Library identify as John Taylor, an astrologer and mathematical practitioner of Norwich. However, Fred Sawyer, of the North American Sundial Society, pointed out in an email to me that the introduction to this work mentions "*the famous Samuel Foster*" and "*Problems I first learned from the reverend Mr. Palmer's Catholik Planisphere*" (see below), so an alternative identification of "J.T." with John Twysden is certainly plausible. Market Harborough is only 20 km north of Northampton, but around 150 km west of Norwich.

Much later, in 1685, came "*The Use of the General Planisphere, called the Analemma. In the Resolution of some of the Chief and most useful problems of Astronomy*". Appended to it are works by Samuel Foster ("The description and use of the nocturnal") and John Palmer ("The planetary instrument, or, the description and use of the theories of the planets", discussed below). In a rather wistful preface Twysden regretted the passing of his two friends.

Twysden's "*Use of the General Planisphere*" concerned itself more with dialling than with what we would now consider astronomy. The work appears originate from much earlier in Twysden's life; in particular, from his time in France. Twysden starts by saying that "*The Uses now given thee, were by me applied to this instrument many years since, when I was in Paris, about the year 1645, which hath made me in some of the examples make use of the Elevation of the Pole at that Place.*" The latitudes mentioned

in the worked examples are mostly 49 degrees N, or in one example 48 deg 50' - both are consistent with Paris or its locality. 52 deg N, consistent with London, is mentioned once, but also 46 deg 12' N, which is the latitude of central France. The latitudes of Rouen (49 deg 30' N) and Angers (47 deg 30' N) are not mentioned.

Among his non-astronomical publications were:

"A small Treatise of Architecture Military, or Fortification" and *"Certain mathematical problems, concerning triangles as well obliquant as rectangled, analytically resolved and effected."* (1659)

"A Disquisition touching the Sybills and Sybilline Writing in which Their Number, Antiquity, and by What Spirit they were Inspired, are succinctly discussed. The Objections made by Opsopaeus, Isaac Casaubon, David Blondel, and others, are examined, as also the Authority of those Writings affected. Which may serve as an Appendix to the foregoing Learned Discourse touching the Truth and Certainty of Christian Religion." (1662)

"Medicina Veterum vindicate, or An Answer To a Book Entitled Medela Medicinae; In Which the ancient Method and Rules are defended, and further shewed, that there is no such change in the Diseases of this Age, or their Nature in general, that we should be obliged to an alteration of them. Against the Calumnies and bitter Invectives of an author who calls himself Mr N. Med. Londinens, but in the Epistle before a Book, put out by Mr. Bolnest, gives himself the name of Mar. Nedham." (1666)

Twysden never married. He died 13th September 1688, and was buried in St. Margaret's Westminster.

Easton Maudit, Northamptonshire

Easton Maudit, (Figs 6 & 7) (sometimes Easton Mauduit, Easton Macudit or Easton Maudinit) is a small village 15 km to the east of Northampton, to the south of the River Nene. The Yelverton family acquired a manor house in the village in 1578 and Sir Henry Yelverton (1566-1629), father of Sir Christopher, probably rebuilt the house. By contrast, the Yelvertons acquired New House in Coventry some time after 1624 - it isn't clear to me why they needed two manor houses in the Midlands, unless perhaps they used New House in Coventry whilst rebuilding Easton Maudit. The Easton Maudit manor was a large house, rated at 43 hearths on the 1673 Hearth Tax Returns. An engraving in the British Library, dating from 1721, shows an

elegant ivy-covered building with a tree-lined courtyard. The house remained in the Yelverton family until 1801, when it passed to the Comptons of nearby Castle Ashby; they demolished the house. The site of the manor is now an undistinguished field to the immediate north of Easton Maudit's church.

In the early seventeenth century, the Yelvertons were an important family. Sir Christopher Yelverton (d.1607) was speaker of the House of Commons. His son, Sir Henry Yelverton, was Solicitor General from 1613-17, and Attorney General from 1617-21. Henry's son, Sir Christopher was admitted to Gray's Inn in 1607 (sixteen years before Sir Roger Twysden in 1623). Sir Christopher's son, another Henry (Harry), studied at Wadham College under John Wilkins, of whom more below. Harry married Susanna Longueville, from a wealthy Kent family

In my previous article, I detailed the astronomical observations in a paper called *"Observationes Eclipsium"*, from Samuel Foster's *Miscellanies* (1659), edited by John Twysden after Foster's death, and dedicated to Susanna Longueville. The majority of these observations were made by Samuel Foster from London, but Twysden tells us that *"...The observation of the eclipses, the motion of the late comet, with some other things, I have added of my own, which being of themselves not worthy of the presse, I made choice to hide under the shadow of so great a Person [i.e. Foster]"*. (The "some other things" include the treatises described above on fortifications, certain mathematical problems, and dialling)

John Twysden's Observations from Easton were as follows:

1. A sunspot (Fig: 8)

"Upon Tuesday the second of July in the year 1651, about eight of the clock at night, at Easton in Northampton, under the elevation of the North Pole 52 d. 15 min., I saw in the body of the Sun (through an excellent Telescopium whose Glasses were very clean) a very dark round spot in diameter about



Fig 6: The small village of Easton Maudit in 1721



Fig 7: Easton Maudit, Northampton, today,

12 part of the Suns diameter, which to my sight appeared still in the same place for a matter of 9 or 10 min through thin clouds often interposed, and hindered me from the sight of the Sun for a short time. The left margine of the Sun was very uneven, and tooth'd in the manner of a Saw, as in the adjoining Scheme. I conceive that it was one of those spots which Galileus, Scheinerus, Hevelius and others have observed. For I cannot suspect Mercury in that place."

This is the only place in Foster's *Observationes Eclipsium* where a telescope is explicitly mentioned. The description does not sound very much like a sun spot, as sunspots are much smaller than a twelfth of the Sun's diameter, and not always round. However one alternative, a transiting planet, is (correctly) ruled out. Twysden was well-informed to know about the solar-watching activities of Christopher Scheiner and Johannes Hevelius, whose work dated from the 1610s (Scheiner) and 1640s (Hevelius). It's also interesting to note that 1651 was in the early years of the "Maunder minimum", a sixty year period during which there were very few sun spots at all.

2. A lunar eclipse

"The Moon's Eclips observed as it happened at Easton in Northamptonshire, March the 14th, 1652, about three of the clock at night, Latitudo loci 52 gr. 15 min. A Joh Twysden & Joh Palmer"

John Palmer includes this lunar eclipse in his own list of eclipses, published in 1658 (see below). Lunar eclipses, at full Moon, are often associated with a solar eclipse at the preceding or following new Moon, as in this case.

3. A solar eclipse

"The Sun's Eclips observed at Easton in Northamptonshire 1652, March 29 current, about 9 in the morning Lat. 52 gr. 15 min.

11 1/4 digits for 12 obscured 10.28, 10.31 corrected. The times of several phases of the eclipse were observed by a minute clock, exactly made and corrected by a true hour found by the Sun's azimuth, often observed during the Eclips, which I judged the better way in this eclips, because the end of it falling near noon, a little error in the altitude would have caused a considerable difference in the time, which by this way is avoided"

Eleven and a quarter digits out of twelve eclipsed would have been a spectacular sight, although John Palmer, observing nearby in Ecton (see below), commented that "...though this eclipse was so great, yet we could read in the time of greatest darkness within Dores, notwithstanding that the window was covered with a Blanket". The eclipse of 1652 was mainland Britain's last-but-four total eclipse, being total over lowland Scotland. Samuel Foster observed this eclipse from London.

Ephemerides Origani exhibent locum Mercurij.

In Meridie quoad longitud. gr.	8.58	☉ 19 d. 19' 16"	
Latitudinem	4.10		
Argols Ephem. facinur long.	0.412	☉ 19 d. 42.27	
Latitudinem	3.17		
Ecl. adis Ephemer. Longit.	19.08	☉ 19 d. 45.10	
Latitudinem	4.05		
<i>Locus Mercurij juxta Tab. Lansbergij.</i>			
Equal. motus orbis S d ' ''	$3 17 20 33$	Tempus in sexage. $2'' 47' 27'' 24 d. 20'$	
Eq. motus Solis	$1 50 18 40$		
Eq. motus Apog. S d ' ''	$4 00 03 19$	Distan. S d ' ''	$4 8 22 25$
Anomalia Centri	$3 50 15 21$	Ergo latitudo declinationis	
Prosthaphar. centri additiv.	$02 27 30$	austrina correcta	$0 3 30 11$
Longit. Mercurij Centrica	$1 52 46 10$	Latit. reflexionis austrina	
Anomalia Orbis vera	$3 14 53 03$	correcta	$0 0 19 3$
Prosthaph. orb. absolut. subtr.	$0 7 07 43$	Latitudo austrina Mercurij.	$3 d. 49' 14''$
Verus locus S d ' '' ab Eq. medio	$1 45 38 27$	Longitudo S d ' ''	$15 d. 48' 40''$
Prosthaphar. Equinoctioru	$0 00 10 13$	Latitude austrina	$3 49 14$
Ergo verus Mercurij locus	$1 45 48 40$	Locus Solis S d ' ''	$20 04 03$
Longitudo S d ' ''	$15 d. 48' 40''$	Pro Meridiano <i>GERMANO</i>	

Fig 8: A large sunspot seen on Tuesday the second of July in the year 1651

4. A comet (Fig 3: cover)

The motion of the late Comet as it was observed at Easton in Northamptonshire Anno 1652, Lat 52 d. 15 m.

Tuesday Decem 14, when the middle starre in the section of Taurus was South. The Comet was distant from the right foot of Heniochus 21.00. From the Bull's eye 12.00. And was West from the rest as in the figure. His longitude at this observation will be found Taurus 26.45. With North Latitude 3.30.

Wednesday the 15 Decemb. Distance from the right foot of Heniochus 22g 17m. From the bright star called Hircus 25.00. Therefore his longitude was Taurus 25.17. North Latitude 0.09.00. The Southernmost in the Whales-tail was in the Meridian.

Thursday 16 December. A right line extended through the Centers of the two starres in the left foot of Perseus, touched the lower limb of the Comet, and they were at an equal distance, one from the other.

Friday 17. Was cloudy.

Saturday 18. It made very neer an equilateral Triangle with the two bright starres in Medusas head.

Sunday 19. Was cloudy, but once I saw in the light of it much decayed about two degrees distant from Gorgons eye, and very neer in a streight line with the Buls eye.

Wednesday the 22. The Comet was intercepted by a right line that passed through Gorgons eye, and the obscure starre in the left shoulder of Perseus. It was distant from the Gorgons eye Westward 4d. 40m. It was a little above those starres toward the North, and in the middle between them very neer. The first in the Whales head was in the Meridian.

Thursday 23, a little past eleven. The comet was distant from the Gorgons eye 5d. 25m. Westward, yet above it toward the North, and in a right line with the left shoulder of Perseus. Its light was very dimme.

Friday the 24. It was distant from the Gorgons eye 6d. 23m. and in a right line with the left shoulder of Perseus. The light was so dimme, I could hardly see it. It seemed to tend to our Zenith."

The comet, nowadays given the designation C / 1652 / Y1, was first recorded by Jan van Riebeeck, governor of the newly established Cape Colony of South Africa, and is the first astronomical discovery ever recorded from southern Africa. Johannes Hevelius observed it a few days later, and there are many other accounts of it. Edmund Halley computed the orbit and decided that it was non-periodic. I am obliged to Henk Brill for permission to use an engraving in his possession of the comet, as observed from Regensburg. This confirms the motion of the comet, although curiously the Pleiades are rendered the wrong way up - Henk Brill suggests this is evidence that the observer was using an astronomical (inverting) telescope.

To these observations from Easton recorded by Twysden we can add one further lunar eclipse, seen by John Palmer from Easton on October 8th 1641, and detailed later in this article.

John Palmer and family

John Palmer (on cover, right) was born on November 18th 1612, the first son of Joseph Palmer, gentleman, of Cropredy, Oxfordshire, and Anne Dod.

Palmer's maternal grandfather was John Dod, (Fig: 9) rector of Canons Ashby. Dod achieved some fame as a "decalogist" or writer on the ten commandments. Dod had three children, a son and two daughters, Anne and Jane. The other daughter, Jane, was the mother of John Wilkins (1614-1672), Warden of Wadham College (from 1648), Bishop of Chester (from 1668), and a leading light in the foundation of the Royal Society. Wilkins tutored Harry Yelverton during his time at Wadham.



Fig: 9. John Dod

John Palmer was admitted to Emmanuel College on 7th May 1629, received his BA 1632-3 and MA 1636. After Cambridge, the first location I can place him for certain was in Coventry for the lunar eclipse 9th December 1638, already mentioned. The second of Palmer's lunar eclipse observations is from Easton Maudit, on 8th October 1641.

Palmer became the Rector of Ecton, (Fig: 2, cover) Northamptonshire, on 18th November 1641, and remained in this post for the rest of his life (1641-79). Shortly after becoming Rector, Palmer married Bridget, daughter of Clifton Catesby, the squire of Ecton. They had three sons and five daughters. The eldest two sons, John and Thomas, also attended Cambridge University.

Ecton is a beautiful Northamptonshire village, 8km east of Northampton, on the northern slopes of the Nene Valley. In recent years, Northampton has grown to within a kilometer of the village but green-belt regulations have so far maintained the character of the village. Three kilometers to the south-west, across the river, is the village of Little Houghton, where Samuel Foster's cousin Thomas Martin was rector. Easton Maudit is 8km to the south-east of Ecton.



Fig: 10 Monument to John Palmer, surmounted by a marble bust, dating from 1732 in Ecton church.

Perhaps the most famous family to live in Ecton were the Franklins, ancestors of Benjamin Franklin. Benjamin's uncle Thomas Franklin Jr. (1637/1638-1702) and aunt Eleanor Franklin (d. 1711) are buried in the churchyard and receive regular visits from students of American history. Benjamin Franklin himself visited in 1759. Benjamin Franklin's grandfather, Thomas Franklin Snr. (1598-1682) was the subject of *"A short history of the Family of Thomas Franklin of Ecton in Northamptonshire"*, written by his son, Benjamin Franklin the elder, and dated 21st June 1717. It says of Thomas Snr., *"He was a historian, and has some skill in Astronomy and chymistry which made him acceptable company to Mr John Palmer the Arch Deacon of Northampton"*. The original of this work is in the Beinecke library of Yale University, although the text can be found on the Internet. I'm very grateful to Rodney Ingram of Ecton for bringing



Fig: 11. John Palmer's sons Thomas (1660) and George (1663)

this to my attention.

Palmer's family is also well known in Ecton; his son John succeeded him as Rector, from 1680 until his death in 1715. Five years later, John Palmer's grandson Thomas became Rector. Thomas's brother, also called John Palmer, built the village 'school for poor children', which still bears a memorial to him. This John Palmer had his portrait painted by William Hogarth.

There are several memorials to the Palmer family in Ecton church of St Mary Magdalene. On the north wall of the nave is a memorial, giving a family tree for the Palmer family, and their descendents, the Whalleys. In the chancel is a monument to John Palmer, surmounted by a marble bust, (Fig: 10) dating from 1732, by Rysbrack. The bust shows a cavalier figure with flowing locks. A terracotta study of the bust is kept in the entrance hall of the Rectory, Ecton House, which was built for John Palmer Jr. in 1693. The Rectory building is now a private house.

There is also a memorial plaque, which reads (in translation):

JOHN PALMER M.A. (Eldest son of JOSEPH PALMER, Gentleman, of Cropredy). Archdeacon of Northampton and faithful Pastor of this church. He married BRIDGET daughter of CLIFTON CATESBY, Esquire. They had eight children whose births are inscribed below. Died in Christ 9th December A.D. 1679 in his 67th year. Rector for 39 years.
BRIDGET PALMER daughter of CLIFTON CATESBY of Ecton, widow of JOHN PALMER, Archdeacon of Northampton. Born 5 February 1626. Died 19 May 1680 in her 54th year.

ANN Oct 8 1648
ANN Sep 2 1648
MARY May 25 1651
SUSANNA Sept 18 1653
JOHN July 19 1656
SARAH May 30 1658
THOMAS Dec 30 1660
GEORGE Nov 22 1663

Bridget Duckenfield of Surrey is a descendant of Nathaniel Bridges, brother of John Bridges (1666-1724), antiquarian and author of an early history of Northamptonshire. In her family's possession are three portraits of the Palmer family by Thomas Shipley: John Palmer, and his sons George and Thomas (Fig: 11). To my mind the portrait of Palmer is not unlike that of Twysden, from Bradbourne House, but a short caption on the portrait confirms that it is indeed Palmer.

Palmer's eclipse observations (see below) place him in Northamptonshire (Ecton and Easton) at many dates during the period 1641-58. However, his degree was incorporated at Oxford in 1657, and his first work published in London in 1658, so Palmer

was certainly not confined to his immediate rural neighborhood. Additionally, Palmer was the archdeacon of Northampton from 1665-79.

John Palmer died on 9th December 1679 and was buried there on 12th December 1679. His wife died 19th March 1681 and was buried at Ecton three days later.

John Palmer's publications

In 1658, John Palmer edited an edition of John Blagrave's *"Mathematical Jewel"*, published by Joseph Moxon (Fig: 1 cover). The original of *"Mathematical Jewel"* had been published by John Blagrave of Reading in 1585. This described the usage of a spherical planisphere to solve various astronomical problems.

The full title of Palmer's version of the work is *"The catholique planisphaer, which Mr. Blagrave calleth the mathematical jewel; briefly and plainly described in five books: hereunto is added a brief description of the cros-staf and a catalogue of eclipses."* Palmer dedicated the book *"To My Honoured Friend John Twysden Doctor of Physic, Ecton April 1st 1658"*

In *"The Whole Art of Reflex Dialling"*, John Twysden praised Palmer fulsomely for the planisphere. *"Of all projections of the Sphear I know none so none so exact for the performance of all things necessary for making these Dials, as the solution of all other Astronomical Problems, as that commonly called Blagrave's Jewel, now put out, everything much amended, and altered by Mr. John Palmer, Rector of Eton in Northamptonshire my especial friend."* Likewise, in Twysden's preface to Foster's *Miscellanies* *"My especial friend Mr. John Palmer, the learned Rector of Ecton in Northamptonshire, hath under a new method made clearly new the Universal Planisphere of Gemma Frisius, furnished with its Rect. By John Blagrave, exhibiting at one view several projections of the Sphere."*

"The Catholique Planisphere" begins with instructions on how to build the planisphere, followed by detailed instructions on how to use it *"for representing several projections of the sphere"*, *"for resolving all problemes of the sphere, astronomical, astrological, and geographical"* and *"for making all sorts of dials both without doors and within upon any walls, cielings, or floores, be they never so irregular, where-so-ever the direct or reflected beams of the sun may come"*. The section on astrology is a fulmination against the art, which Palmer clearly disapproved of (*"I could never see any good reason why the influence of the stars should make more impression upon the Child in the moment of his nativity, than they did at any time before his birth"*). It is perhaps not surprising that Palmer should follow his friends Foster and Twysden by including detailed instructions on sun-dialing.

The addendum on the use of the cross-staff is a

short instructional manual. From an astronomical point of view, the most interesting section is the second addendum on observations of eclipses. As with Foster's *Observationes Eclipsium*, Palmer's catalogue contains a wealth of detailed measurements. In summary, the catalogue of Eclipses is as follows:

1. Coventrie, Tue 11th December 1638, a lunar eclipse, viewed with Samuel Foster and John Twysden
2. Easton Maudit, Friday October 1st 1641, a lunar eclipse
3. Ecton, Monday August 11th 1645, a solar eclipse
4. Ecton, Wednesday May 16th 1649, a lunar eclipse, observed with Samuel Sulesby of Queens College Cambridge.
5. Ecton, October 25th 1649, a solar eclipse, by a telescope
6. Easton Maudit, Monday March 15th 1651/2, a lunar eclipse, observed with John Twysden
7. Ecton, March 29th 1652, a solar eclipse, observed by a telescope with a minute watch, "in the company of Gentlemen and Ministers my neighbors". Palmer estimated that the greatest eclipse was 11.22 1/2 digits of 12, at 10:32.04 AM. (Compare with Twysden's estimate of 11.15 digits and 10:31 maximum time from a location just a few km to the east)
8. Ecton, Tuesday September 7th 1652, a lunar eclipse
9. Ecton, Wednesday August 2nd 1654, a solar eclipse observed by telescope "in the company of many learned men my Neighbors and friends".
10. Ecton, Thursday August 17th 1654, a lunar eclipse observed by telescope.
11. Ecton, Tuesday January 1st 1655/6, a lunar eclipse. "Clouds hindered, but I observed".
12. Ecton, Monday January 25th 1656/7, a lunar eclipse.
13. Ecton, Thursday December 10th 1657, a lunar eclipse.

Palmer then comments (with some pride, perhaps) that *"From the first Eclipticall opposition mentioned in this catalogue to this last is the space of a Metonique Year"* (a Metonic cycle of 19 tropical years, after which eclipses etc. repeat with an error of around 2 hours). The eclipse reports for Ecton and Easton include determinations of latitude and longitude for these two locations. These later became reference points for the map of Northamptonshire which John Morton published in his *Natural History of the county*.

A second edition of the catholique planisphere was published by Walter Hayes, an instrument maker, in 1685. However the edition I have seen of this, in Cambridge University Library, does not contain a section on eclipses, so I don't know of any further observations of eclipses by Palmer after 1658.

Eva Taylor's potted biography of Palmer has him as one of the sponsors of Thomas Salusbury's



Fig: 12. John Palmer's cousin, John Wilkins, was a founder member of the Royal Society

Mathematicall Collections (1661-65), an important translation of works including Galileo and Kepler. However the introduction to a 1667 edition of this work held online as part of the Archimedes collection [Archimedes.impiwg-berlin.mpg.de] fails to mention Palmer amongst those Salusbury thanks.

During the 1660's, John Palmer became associated with the fledgling Royal Society. Palmer's cousin, John Wilkins, (Fig: 12) was a founder member of the Royal Society; also Palmer's degree was incorporated at Oxford in 1657, so there were opportunities for him to become acquainted with Royal Society members. In a letter from Henry Oldenburg, the Secretary of the Royal Society, to Robert Boyle, dated September 1st 1664, Oldenburg writes "On Munday last a Club of our Philosophers went to Pauls, to make Experiments of falling bodies, and of pendulums; There were Sir R.Moray, Dr Wilkins, Dr Goddard, Mr Palmer, Mr Hill, Mr Hook, and some of ym went to ye top of ye steeple, and let downe a pendul of 200. ft long, wth an appendant weight of [14] lb, and found 2. vibrations thereof made in 15". Time would not then give leave to proceed to ye other Experiments yt were deseigned, among which will also be ye Torricelian: but they will be set upon within 2. or 3. dayes"

In another letter dated April 1st 1664, from John Wallis to Johannes Hevelius, Wallis writes "As for the marvelous star in Cetus that appears and disappears from time to time (about which you wrote a commentary), which my countryman John Palmer has observed from the year 1639 onwards, and others upon his instigation, I have nothing to add to what I imparted to you in the letter I sent last year, except that (which is also remarkable) he advised me that for some years he inquisitively investigated that star, he could never see it in the western hemisphere even when it was visible in the eastern hemisphere. For after he had observed it in the east and had noted

its approach toward the meridian, when the star reached that point it unexpectedly disappeared and could not be seen beyond it. And it is quite true that after he had sought for it vain over many years, at last he saw it even beyond the meridian towards the west sometime, but only rarely."

The marvelous star in Cetus is omicron Ceti, to which Hevelius gave the name Mira, "the wonderful", by which it is known today, and after which our society's wonderful journal is named. It was first noted by Fabricius in 1596, who was charting the apparent path of Mercury; Fabricius, finding a new star on his charts, thought he had discovered a nova. The dutch astronomer Holwarda, observing in the 1620s, was first to discover that Mira appeared and disappeared on a regular basis (in reality, it is a pulsating giant star nearing the end of its life). Hevelius and Palmer were among the first to study its behavior systematically. Palmer's observation that it could only be seen the eastern hemisphere is, at first sight, bizarre. One possible explanation is based on the fact that Mira's brightness varies between approximately 3rd and 9th magnitude over a period of around 337 days; quite close to a year. If Palmer only observed Mira at the same time each night, then year-on-year Mira would be at its brightest at approximately the same time of year, and therefore in the same part of the sky; however, this would change gradually because Mira's period is 28 days short of a year.

On 3rd December 1667 Henry Oldenburg invited John Palmer to enter into a "Philosophical correspondence especially in Astronomy and Algebraical Aequations". Oldenburg noted that he had made "many choice observations in Astronomy". Palmer replied on 12th December, expressing his thanks and appreciation, but regretting that his appointment as Archdeacon of Northampton meant that he had been "much diverted from following these studies wherein I so much delighted". He made a suggestion of observing the moon's meridian altitude from a variety of locations "at Edinburgh, Aberdene, or Catness [Caithness]" so that "the distance of the Moon might be solidly demonstrated" by triangulation. Palmer also suggested that the start and end times of lunar eclipses might be noted from "Smyrna, Aleppo or Bantam [Java] in the east & with Bermuda ... Barbados or Jamaica in the west", also to the end of determining the lunar distance by triangulation.

Oldenburg was taken with these suggestions. In a second letter to Palmer, dated 21st December 1667, Oldenburg told Palmer he had published these suggestions in the Royal Society's Philosophical Transactions. He also passed on to Palmer observations made by Cassini about the motion of the planet Venus upon its axis (observations which we now know to be spurious). In a postscript he questioned Palmer about his skill in mathematics, "having been informed that you had a way of resolving all

Equations and hard Problems of Arithmetick by Regulus Falsi [False Position, a technique for solving linear equations].

Palmer replied to Oldenburg on 24th February 1667/8, saying that he did indeed have a method of “*resolving all Algebraicall Questions by the Rule of False [Position]*”; however he intended to “*spend some further thoughts about it & as soone as I can come to any conclusion, I shall acquaint you with it*”. This was read to the Royal Society on 27th February 1668, when “*it was ordered that should be encouraged in his undertaking by a letter of thanks*”. However no further correspondence between Palmer and the Royal Society is recorded.

The final work of John Palmer to be published was “*The Planetary Instrument, or Description and Use of the Theories of the Planets*”, edited by John Twysden and published by Walter Hayes in 1685, after Palmer’s death. This short work contains two diagrams or Plates, eight inches in diameter, drawn by Hayes, showing the solar system to scale during the period 1672-1680; the first is the “*Saturn Plate*” showing the outer planets, the second the “*Mars Plate*” showing the inner solar system. Palmer gives instructions on how to locate the planets in their orbits, and then gives a series of worked examples on the usage of the planetary instruments in real situations. Two examples show that Palmer was still observing during the 1670’s:

“*1675 April 1st. I saw Mars above the foremost foot of Apollo [?], and he seemed to be much diminished in magnitude.*”

“*1673 May 25th. In the day time I saw Venus with a telescope, horned like the Moon at 3 or 4 days old.*”

Palmer explains both these observations in terms of the relative positions of Earth, Mars and Venus in their orbits. Clearly he had a strong practical grasp of solar system astronomy. He also made pointed out that there would be a transit of Mercury across the Sun on October 28th 1677 [November 7th new style] - this was observed by Edmund Halley from St Helena. In view of the discussion in my previous articles, it is worth mentioning that Palmer makes no mention of a transit of Venus.

Palmer describes his plates as “*... excellent schemes to help the conceptions of young astronomers*”. It’s interesting to see that Kepler’s laws of planetary motion, only discovered in the first two decades of the seventeenth century, were the subject of “*how-to*” manuals by the closing decades of the century.

Conclusion

John Twysden and John Palmer were not major figures in the history of English astronomy, but their lives are still of significance as they are indicative of the importance of gentlemen scientists during the seventeenth century. Certainly major advances were taking place in London and in the universities at this

time; but out in the shires, professional, well-educated men were doing astronomy to a high standard, for their own interest.

I think that John Palmer was the better astronomer of the two; certainly he was more focused on the subject. John Twysden seems to have been more of a polymath, and it would appear that his first love was medicine. Perhaps Twysden’s most important contribution to science was to edit the work of his fellow astronomers Foster and Palmer for publication.

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The frontispiece of Blagrave's "Mathematical Jewel" is courtesy of Reading Library.

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Material quoted from Samuel Foster's "Miscellanies, or mathematical lucubrations" (ed. John Twysden, London, 1659) is by kind permission of the Master and Fellows of St John's College, Cambridge.

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In letter 36, Osborne takes credit for arranging marriage between Susanna Longueville and Harry Yelverton, "I have now given my consent that she shall marry a very pretty little gentleman, Sir Christopher Yelverton's son, and I think we shall have a wedding ere it be long". Edward Parry's notes on the letter reveal Yelverton's studies under John Wilkins.

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