

Ash Tree Struck by Lightning

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An Oak Tree Struck by Lightning in Dunham Park. *John Boulton* (1753–1812)
(National Trust, Dunham Massey)

On 4 April 1796 a country parson was in his garden just after midday when it became cloudy toward the south-east and he heard thunder. Clouds formed and more thunder followed with short bursts of rain and hail. Suddenly a bright flash followed, four seconds later by a loud roll of thunder. At the instant when the flash occurred a large, pollarded ash tree which stood around a mile from his vicarage was struck with lightning and was “rent to shivers”.

The parson discovered this because later in the day he visited the site. A local man working nearby had been sheltering from the rain - he appeared to have had a very lucky escape. Our parson

recorded the event in minute detail by examining the tree debris and interviewing witnesses. One report suggested that there might have been two claps of thunder associated with the lightning strike. Our parson also noted that the tree was not the highest in the vicinity, but that its roots were damp.

Many trees must be struck by lightning each year in Britain. So how do we know about this one?



The parson was, of course, the vicar of Potterspurty and Yardley Gobion, the Reverend John Hellins. Many similar inquisitive clerics might have just noted these events in their personal diaries, but John Hellins did something quite different. He reported the events in a formal letter to his former boss and mentor, the Reverend Nevil Maskelyne FRS the 5th Astronomer Royal of England.

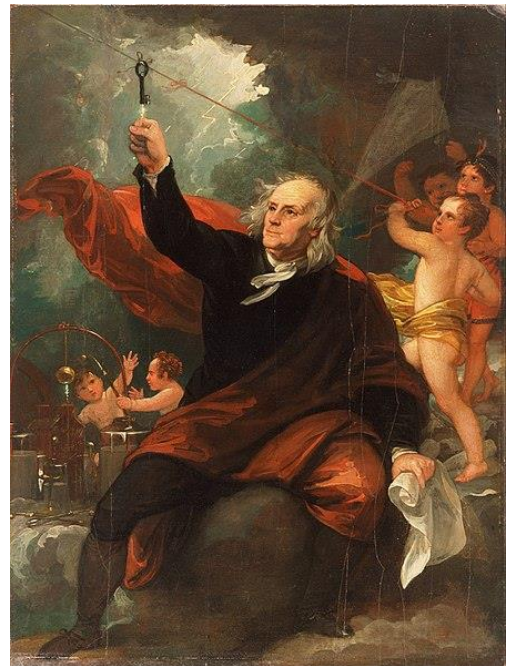
Hellins was 47 years old in 1796. Twenty years earlier, he had worked at the Greenwich Observatory (1773-76) as Maskelyne’s assistant whilst the Astronomer Royal was away carrying out some important field work in Scotland. But that

was twenty-years ago, and he had been “let go” shortly after the astronomer had returned. Whilst at Greenwich he had taken full advantage of its extensive library, learning Greek & Latin and becoming ordained into the Church. Several years acting as curate for absentee vicars, in

Cornwall and Greens Norton followed, but now he was settled in Potterspurpy with his own living funded by the Duke of Grafton. To help his prospects at a cleric he took a degree in Divinity at Trinity College, Cambridge, graduating in 1800. He was settled well enough to marry Anne Brock in 1794, who was also from Devon.

The period Hellins spent in Greenwich at the frontier of enlightenment science had triggered his ambitions to become a professor of astronomy or even perhaps the next Astronomer Royal. He had stayed connected with the rapidly evolving world of maths and he was particularly proud of his four articles published in the elite *Philosophical Transactions of the Royal Society*. Advancement was on his mind.

Hellins knew of the Royal Society's interest in the effects of lightning because of Benjamin Franklin's world-famous experiment of flying a kite in a thunderstorm near Philadelphia which revealed the basics of electricity. Franklin's results were reported to the Royal Society in 1752 which earned him the Copley Medal, the learned society's highest award. Franklin had lived in London for 16 years around the time when Hellins was working in Greenwich and had advised the British government on the protection of important buildings against lightning, including gunpowder stores. A firm believer in the aims of the American Revolution, (and indeed a founding father of the USA), Franklin escaped to France to avoid arrest. However, many in the Royal Society, including its President Joseph Banks and Nevil Maskelyne, remained on friendly terms with him.



Benjamin Franklin Drawing Electricity from the Sky, an artistic rendition of Franklin's kite experiment painted by Benjamin West.



Nevil Maskelyne, Astronomer Royal 1765 to 1811, by Louis François Gerard van der Puyl. (Art UK, Public Domain)

Keen to share his observations on the lightning strike with the Royal Society, Hellins wrote to Nevil Maskelyne.

But Hellins had more reasons for writing his letter than simple scientific interest. He knew that Maskelyne would forward the letter to Sir Joseph Banks, the Royal Society's President. Twenty-five earlier Banks had travelled with Captain James Cook on his first South Seas voyage as a botanist and had become famous. Wealthy, with a wide network of influential contacts in the higher echelons of society from King George III down, Banks disliked the strong mathematical emphasis the Royal Society had adopted under his predecessor Sir John Pringle. In the 1780s a very

public rift had occurred at the Royal Society between astronomers and biologists.

However, Maskelyne and Banks, who disliked each other, had been forced to work together to defend the Royal Society against a claim of bias. It concerned the testing of chronometers at Greenwich notably during the time Hellins worked there. Hellins had been helpful in supporting the society against the claims of bias and as a result relations between astronomers and botanists had somewhat improved. Maskelyne now felt confident enough to seize the moment and propose Hellins as a Fellow of the Royal Society as a “worthy and useful person”.

10 An account of a Thunder-Storm which happened on the 4th of April, 1796, in which a large Ash Tree, in the parish of Potters Dury in the county of Northampton, was rent to shivers. By the Rev. John Hellins, Vicar of that parish. Communicated by Nevil Maskelyne D. S. P. R. S. and Astronomer Royal.

The morning was remarkably calm & serene. Soon after 12 o'clock some clouds ^{were seen} appeared in the south-east, but such as, from their appearance, gave us no apprehensions of thunder. About 1 o'clock, however, thunder was heard, & on going out to see which way the storm was coming, I observed that rain was falling from a cloud a few miles E. S. E. of us, but it seemed too small to be the thunder-cloud, & after I had looked all round the horizon, & seen no cloud which seemed sufficiently dense to produce thunder, I began to conjecture that the noise which had been heard a few minutes before was the sound of a cart somewhere on the road which ^{was thus conjectured} near my house. While I was thus ^{forming conjectures}, there came another clap of thunder from the cloud from which the rain was descending, which appeared to be increasing both in magnitude & density, & approaching towards the zenith. Several other claps succeeded, & in the space of a quarter of an hour we had a hail-storm, with some rain, attended with a brisk breeze of wind, & some claps of thunder. The hail was as large as common peas, but of very irregular shape, & for the most part, flat & cornered. The fall of it here did not continue more than a quarter of an hour, & when it ceased, a calm succeeded for some minutes. Then came a bright flash of lightning, much like the flash of a large cannon when it is fired in the dusk of evening; & about 4 seconds after it, a loud explosion very similar to the report of an heavy piece of artillery, & after that a roll of loud thunder. At the instant when this happened, which stood a little more than a mile from the vicarage house, was struck with the lightning & rent to shivers. And at this explosion the electrical matter in the cloud was so far discharged, that no more thunder was heard from it.

But another thunder-cloud appeared about 3 o'clock in the afternoon, of much greater extent & density than the former, & the storm was of longer continuance, & more tremendous, than the although its effects were not so severely felt here. Its passage, as I collected from my own observations & the accounts of several of my acquaintances, was nearly over Buckingham, Whittlebury Forest, Northampton, & some parts of the county of Lincoln.

Hellins was sure that his letter discussing the lightning strike must surely help his case for fellowship. Around Christmas he would find out if he was successful. Hopefully the influence of mathematics at the Royal Society would be somewhat restored to the level it enjoyed before Banks became President. And surely his letter with its biological background must improve his prospects for advancement?

What Hellins didn't know was Maskelyne also wrote a letter to Banks recalling an oak tree struck by lightning some years earlier. I presume both letters were meant to be “olive branches” in their efforts to keep the truce between the two factions.

“An account of a thunderstorm . . . in which a large ash tree was rent to shivers”, from John Hellins, Vicar of Potterspurty to Nevil Maskelyne, Astronomer Royal

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An account of an oak destroyed by lightning near
Ludlow in Shropshire, about the year 1773; by Nevil
Maskelyne, D.D., F.R.S. and Astronomer Royal. —

The foregoing account of the destruction of an
ash-tree by lightning, related by Mr. Hellins,
brings to my recollection what I saw and heard
concerning an oak struck by lightning many years
ago. Being on a visit near Ludlow in Shropshire,
about the year 1773, I was informed by the late
Rev. John Edwards, who resided there, one of the
computers of the nautical almanac and author
of the improvement in reflecting telescopes published
in the nautical almanac of 1787, of an extraordinary
appearance to be seen a few miles off, in
the effects of lightning upon an oak-tree.
At the same time he offered to go with me
and conduct me to the spot. We went accor-
dingly, and were witnesses of a wonderful
phenomenon, the remains of a large oak, which
had been struck by lightning a few days before.
The tree was almost entirely deprived of its branches,
the remains of them, which had not been destroyed
by the lightning, having, as I understood, been taken
away by the country people. But, what was most
curious, the tree was cleft by perpendicular fibres
towards its center into a multitude of thin laths
all round, from top to bottom, without any or at
least much of the wood being torn from the tree.
The different effect of lightning upon the oak-tree,
in Mr. Hellins's account, may be owing to the greater
toughness of the wood.

"Account of an oak
tree struck by
lightning near Ludlow
in Shropshire about
the year of 1773 by
Nevil Maskelyne DD
FRS Astronomer
Royal".

POSTSCRIPT

I couldn't resist trying to work out where the eponymous ash tree might have been located. Hellins was well adept at time estimation from his work at Greenwich and as an astronomer would also have had a clear sense of direction. For a 4-second gap between the lightning flash and the sound of thunder this should be a distance of around 1.37 km (or 4,500 feet). Applying local knowledge and using Google Maps, it is likely that the tree was growing in the copse alongside the brook that runs from Potterspury Lodge and Moor End towards Potterspury - it contains willows today.

CALCULATIONS

Speed of sound: 343 m (1,125 feet) per second through air.

For a 4-second gap between the lightning flash and the sound of thunder

Distance = Time × Speed of Sound

Metres

Distance = 4 s × 343 m/s = 1,372 m

Imperial

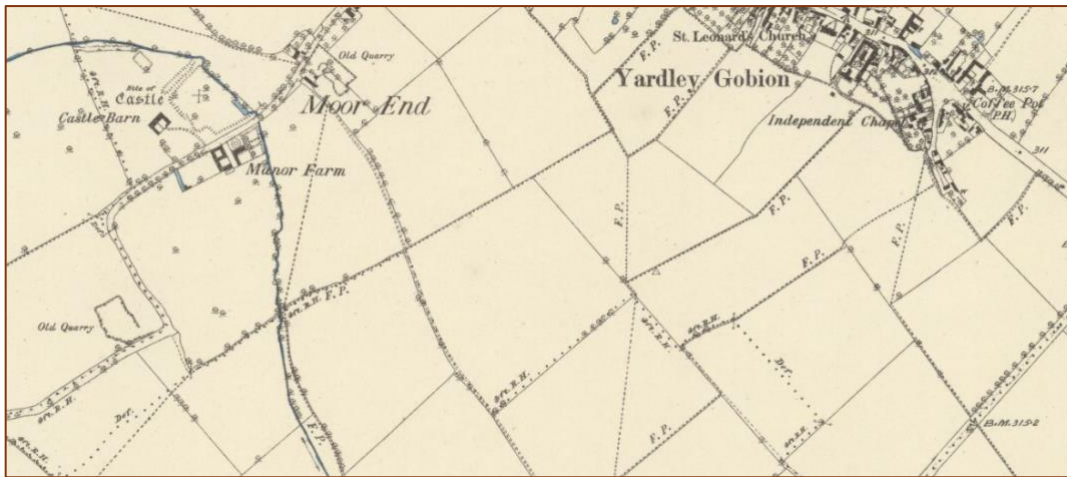
Distance = 4 s × 1,125 ft/s = 4,500 feet

So, the lightning strike was approximately **1.37 kilometres (or 4,500 feet)** away.

Given that the site was low lying, damp and 4,000 ft (7/8 mile) away then it was unlikely to be in Yardley Village proper, and more likely to be in the copse behind Moor End Manor.



*Location of the ash tree "rent to shivers" in 1796.
(Origin possible tree location, distance to vicarage in
Church End shown).*



1883 map of Yardley Gobion and Moor End. Note the trees all along the stream south of Manor Farm and the foot path shown from Yardley.