

# HJ

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# Harrison Memorial Events

THE UNVEILING AND DEDICATION of the memorial to John Harrison in Westminster Abbey on March 24 was an impressive occasion. Preceded by music from the scarlet uniformed Brass Ensemble of the Band of HM Royal Marines, including Gordon Langford's *Fantasy on British Sea Songs*, dignitaries from the Clockmakers Company (WCC) resplendent with gold braid and chains of office, berobed ecclesiastics and HRH the Duke of Edinburgh, dressed as Admiral of the Fleet, and his equerry, processed into the Abbey. After a greeting from the Sub-Dean, former Master, now Deputy Master of the WCC, **Diana Uff**, set the scene followed by **Will Andrewes** and **Dava Sobel**. Will Andrewes is a long term Harrison scholar whose invitation to Dava Sobel to attend the Harrison Seminar at Harvard in 1993 led to the books, TV programmes, films and play, which raised the public profile of the Harrison story to a point where the 14th Astronomer Royal, Sir **Arnold Wolfendale** (who gave the address) was able to use his influence to see that 'the Man who Found Longitude' was finally commemorated in the Abbey. Major General **David Pennefather**, Master of the WCC, invited the Duke to unveil the memorial stone. After a hymn and prayers, the processions were repeated as the dignitaries left to strains from the 3rd Brandenburg Concerto.

It was a truly splendid occasion with an easy pomp that seemed natural, appropriate and uncontrived. The Abbey of course has centuries of experience of such events.

## The Addresses

**Andrews:** The following readings give an insight into the character of the man whom we honour here today, marking the 313th anniversary of his birth and the 230th anniversary of his death.

John Harrison's earliest surviving manuscript — the only extant document from his life in Lincolnshire — was composed in Barrow-upon-Humber in 1730, when he was 37. He begins by describing the improvements he had made in precision timekeeping on land:

*"Some Years ago, I made several alterations in order to render the Motion of clocks more exact, but when I came to try them by strict observation, ... I judged the best performance of the best pendulum clock ... to be incapable of this matter. Yet, I still endeavoured to make further corrections and in these last three years have brought a clock to go nearer the truth than can well be imagined, considering ... in a Month, ... it does not vary above one second."* Later in the same piece, he remarks: *"And if the Sea Clocks were made as here treated, ... I think they would not be much inferior."*

To obtain financial support to build his proposed 'Sea Clock', the then astronomer Royal Edmund Halley referred Harrison to the eminent clockmaker George Graham. Harrison later recorded their meeting:

*"Mr. Graham began, as I thought it, very roughly with me, and the which had like to have*

*occasioned me to become rough too, but, however we got the Ice broke, ... and he ... thence found Reason enough to believe that my Clock might go to a Second in a Month, and ... in Consequence ... to be of great service in the adjusting [of] a Timekeeper for the Longitude. Mr. Graham proved a very great Friend to me, ... not only by his Assistance at the Board of Longitude, ... but also in his so willingly lending me Money, ... without any Security or Interest, ... by the which ... I was encouraged."*

In 1735, at the outset of the trial voyage of his first Sea Clock to Lisbon, the Lord of the Admiralty wrote to the captain: *"The instrument, which is put on board your ship, has been approved by all the Mathematicians in Town that have seen it (and few have not) to be the Best that has been made for measuring Time: ... [John Harrison] is said by all who know him best to be a very ingenious and sober Man, and capable of finding out more than he has already."*

The results of this trial voyage were encouraging; but Harrison had to persevere another 25 years to develop the timekeeper that qualified for the longitude prize. Despite the fact that it took another decade for this achievement to be fully recognized, Harrison knew after the first trial of his prize-winning timekeeper that he had accomplished what he had set out to do. In his concluding remarks about his watch written in 1763 when he was 70, he expressed his heart-felt gratitude: *"I hereby thank Almighty God that I have lived so long, as in some measure to complete it."*

**Sobel:** I cannot help but wonder how John Harrison himself would react to today's proceedings. I feel certain he would enjoy the beautiful music, as he played the viol himself, rang and tuned the bells at his parish church in Barrow, and also served as choirmaster there. But I imagine that this respectful ceremony of long overdue recognition would shock him to the very core of his being, since in life he grew so accustomed to adversity.

In the early stages of his difficult work on the Longitude Problem, he was often his own harshest critic. Even as his fellow clockmakers and members of the Royal Society were admiring the workmanship of his first sea clock, Harrison did not hesitate to find fault with the device and hastened to correct its defects. When his second clock likewise failed to perform to Harrison's high expectations, he drove himself to fabricate a third, more intricate design, working at it steadily for nineteen years without ever losing sight of his goal. In the end, he surprised everyone by abandoning his large marine timekeepers, which each stood at least two feet high and weighed in the neighbourhood of seventy pounds, in favour of his celebrated watch — the fourth timekeeper — only five inches in diameter and weighing just three pounds.

Through two trial voyages to the West Indies, Harrison's watch performed as promised. But



*His Royal Highness the Duke of Edinburgh unveiling the Harrison Memorial Plaque in the floor of Westminster Abbey. The lower end of the stone marking the grave of Thomas Tompion can be seen lower right.*

Harrison, instead of reaping praise and monetary reward, was subjected to criticism, censure, and close questioning under oath about the inner workings of his masterpiece. Frustrated and angry, he suffered the further ignominy of being forced to surrender all his timekeepers to the Astronomer Royal for additional testing at Greenwich where they remain to this day. In his desperation he appealed to the throne for justice and was at last repaid with the King's acknowledgment and financial recompense from Parliament. Although the official Longitude Prize eluded him, he tasted the personal satisfaction of knowing he had accomplished what he set out to do.

After his death, respect for his achievement spread over the world's oceans. His tomb at Hampstead was carved to tell his story. And today we set his name in stone in this historic place, in a fitting location, so that the three greatest names in English horology are here united.

**Wolfendale:** If there is one thing that unites the religious and the secular it is 'time', that curious entity that affects us all and has about it an unearthly quality. The definition of time is not easy. Saint Augustine put his finger on it: *"I know well what time is when no one asks me. But when I am asked, I no longer know what it is."*

From a number of definitions the one I prefer is: *'time is what a clock measures'*. Such a definition is more profound than would first appear.

This brings us naturally to John Harrison, whose achievements we have come here to celebrate and whose memorial His Royal Highness will shortly unveil.

John Harrison was certainly of the bulldog breed. Having got his teeth into solving the



The Harrison plaque with designers Gary Breeze and Joanna Migdal. The stone marking Tompion's grave is in the floor directly behind them. Gary carved the lettering in the Purbeck Grub limestone, the same stone (in a different colour) as the remainder of the Abbey floor, and Joanna made and engraved the brass and stainless steel bimetal longitude line (at 000°07'35"W, inset) which runs through Harrison's name as it did through his life. Note that the vertical diagonal on the stone, the axis of the Abbey, does not lie precisely East West, a point discussed in the commemorative booklet available from the WCC. Joanna's rather fetching hat is 102 years old. It belonged to the grandmother of her husband, Sir George White Bt, Curator of the WCC collection at Guild Hall.

'Longitude Problem', he persevered year after year until he had worked out the solution. Not for him apprenticeship to a learned master clockmaker, but hard slog, intuition and an inventive genius. From his wooden clocks, in the early 1720s, he progressed to the construction of a regulator, accurate to a second a month. His clocks remind us of Francis Bacon's 1625 essay, which included the words: "He that will not apply new remedies must expect new evils; for time is the greatest innovator."

A succession of prototype sea clocks led to the production some 40 years later of a large watch, the so-called H4, with which he eventually won at least the Prize-money, the Prize itself having disappeared when the Government modified the rules (nothing really changes!)

H4 and the earlier clocks are exhibited in the Royal Observatory at Greenwich. That they have survived at all is due largely to two men. The first was a retired naval commander – Rupert Gould – who, in the 1920s, started a 28-year long project to restore what had become ageing relics. The second was Humphrey Quill, a retired member of the Royal Marines, who, starting in the 1950s, continued the task and researched Harrison's work in general. In a sense today's ceremony represents the culmination of the train of events started by these two men.

What of the other attributes of John Harrison? Although "no great lover of music", he devised a new musical scale and pioneered tuning standards. His interest in pendulums, with their obvious musical connections, contributed to his development of pendulum-driven clocks for use on land and other periodic

devices for his sea clocks.

It is tempting to think that this appreciation of periodicity was tied up with his sincere religious beliefs. Within the smooth march of time we have the cycle of day and night caused by the rotation of the earth about its axis and used for so long as a unit of time. Similarly, the seasons are due to the motion of the earth around the sun. These cycles, together with that of birth and death for mankind, involve the pursuit of perfection and are, in my view, a fundamental tenet of Christianity. Indeed, in Paley's *Natural Theology* of 1802 the watch was taken as an analogue of the world and the watchmaker as God. Interestingly, the introduction by John Harrison of watches of such great precision and their use by James Cook in his famous voyages into the Pacific in the mid 1770s seem to have played a part in Paley's introduction of this continuing analogy.

The search for perfection was certainly a characteristic of John Harrison in his horological work and his brilliant success despite all his problems, both technical and human, fully entitle him to be remembered here, within sight of the tomb of another great man, Isaac Newton.

In 1772, King George III supported Harrison in his quest for the remaining Prize Funds and was heard to mutter "these people have been cruelly treated" – and aloud he said "By God, Harrison, I will see you righted". He did.

Your Royal Highness, we were delighted when you agreed to unveil this memorial, as by your presence and interest you have shown the most practical way of seeing Harrison's memory righted.

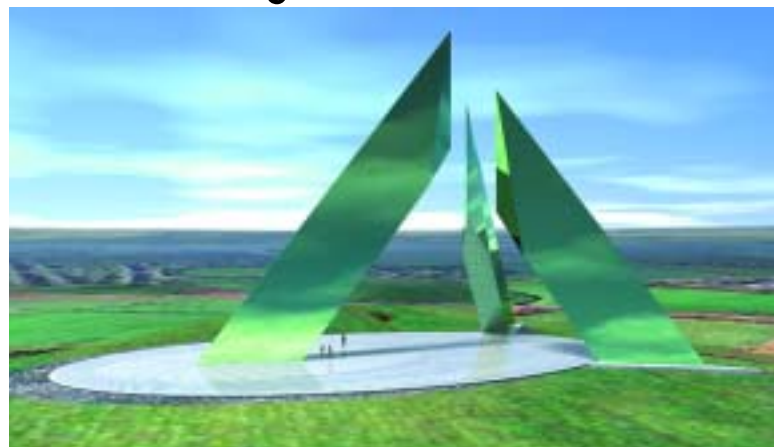
### Associated Events

The night before the Abbey ceremony a splendid formal banquet had been held in the Royal Society. The unveiling was followed by a buffet lunch at the nearby Institution of Civil Engineers and an afternoon of lectures by **John C Taylor** (Harrison's Early Wooden Clocks), **Dava Sobel** (The Elusive Longitude Prize) and **Jonathan Betts** (Harrison's Legacy and its Preservation).

It was a thoroughly memorable series of events, well attended and impeccably organized (no small matter when the security of national figures is at stake) reflecting great credit on all concerned, especially **Joe Buxton**, Clerk to the WCC.

Timothy Treffry

## Solar Pyramid



THE ARTIST'S IMPRESSION, above, is of a 58m 'Solar Pyramid' to be built adjacent to the M1 in Derbyshire, 8 miles south of Sheffield. A giant sundial, the towers will be clad in mirror finished stainless steel reflecting the surrounding landscape and changing skies. The tallest is set at the angle of the local latitude (52.35°) and will cast a shadow giving time and equation of time on the 60m elliptical paved area at the base. The other towers align with sunrise and sunset at the summer solstice. Submerged below the base, a solar powered precision clock will emit pulses of light each minute which will be reflected off the central vertical faces of the towers.

The project is supported by the British Sundial Society and the WCC as well as National and Local Government. See: [www.solarpyramid.co.uk](http://www.solarpyramid.co.uk) □